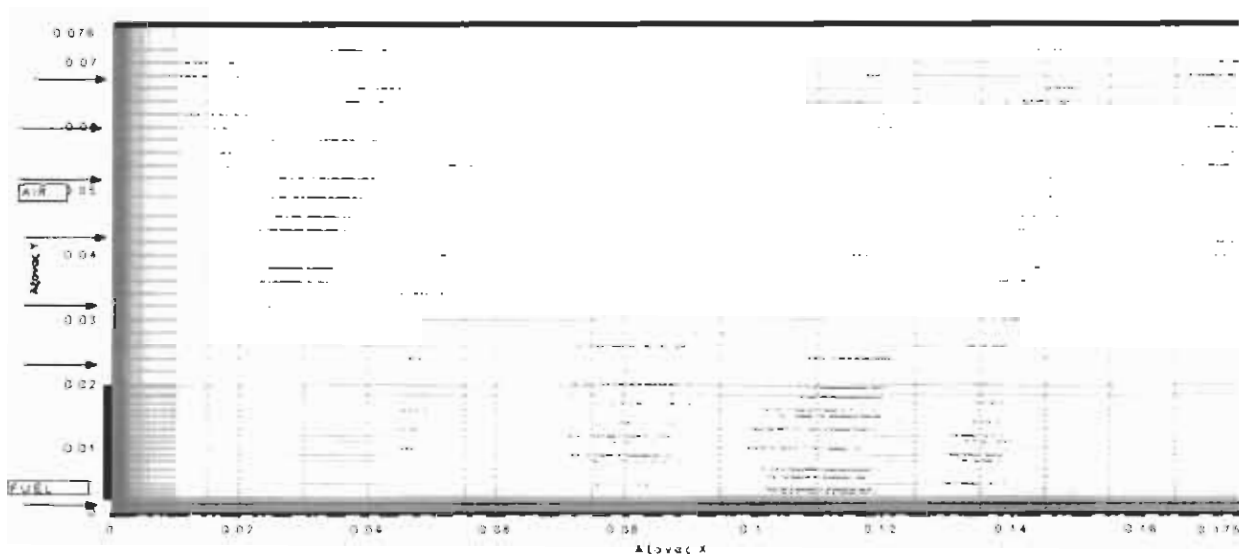


ΤΕΙ ΠΑΤΡΑΣ
ΣΧΟΛΗ ΤΕΧΝΟΛΟΓΙΚΩΝ ΕΦΑΡΜΟΓΩΝ
ΤΜΗΜΑ ΜΗΧΑΝΟΛΟΓΙΑΣ

ΠΤΥΧΙΑΚΗ ΕΡΓΑΣΙΑ: ΕΙΔΙΚΑ ΘΕΜΑΤΑ ΥΠΟΛΟΓΙΣΤΙΚΗΣ ΡΕΥΣΤΟΜΗΧΑΝΙΚΗΣ



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6. ΒΙΒΛΙΟΓΡΑΦΙΑ

Ευχαριστούμε τον υπεύθυνο καθηγητή για την
πτυχιακή μας κ. Κώστα Μαυρίδη για την παροχή
γνώσεων και για την συνεργασία του κατά την
διάρκεια αυτής της πτυχιακής εργασίας.

1. ВЕРПУТКА ЛОНЕА

1.1. ΑΝΤΙΚΕΙΜΕΝΟ ΚΑΙ ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΤΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ TEACH-T

Στα κεφάλαια 1 έως 6 δίδονται τα κύρια χαρακτηριστικά της γενικής μεθόδου πρόβλεψης για την μεταφορά ορμής, μάζας και θερμότητας, που είναι ενσωματωμένα στον υπολογιστικό κώδικα TEACH - T. Το υπολογιστικό πρόγραμμα είναι γραμμένο για μόνιμη διδιάστατη (δυνατότητα επέκτασης σε τρισδιάστατη), τυρβώδη (ή στρωτή), επίπεδη (ή αξονοσυμμετρική), ασυμπιεστή ροή με ανακυκλοφορία. Υπάρχει δυνατότητα επέκτασης για εφαρμογή σε μη-μόνιμες τρισδιάστατες ροές. Η παρεχόμενη λίστα προγράμματος είναι γραμμένη για ροή σε σωλήνα με απότομη εκτόνωση (γεωμετρία STEP).

Ο υπολογιστικός κώδικας επιλύει τις σχετικές εξισώσεις διατήρησης ορμής, μάζας, ενέργειας, κ.ο.κ, με μία μέθοδο πεπερασμένων διαφορών (hybrid). Οι χρησιμοποιούμενες κύριες υδροδυναμικές μεταβλητές είναι οι ταχύτητες και η πίεση. Για την λύση των πεδίων ταχύτητας και πίεσης χρησιμοποιείται μία ειδική διαδικασία η SIMPLE μέθοδος (Patankar and Spalding, 1972) και η κάθε εξίσωση επιλύεται με μία LBL διαδικασία επίλυσης χρησιμοποιώντας τον TDMA αλγόριθμο.

1.2. ΕΦΑΡΜΟΓΕΣ ΜΕΘΟΔΟΥ

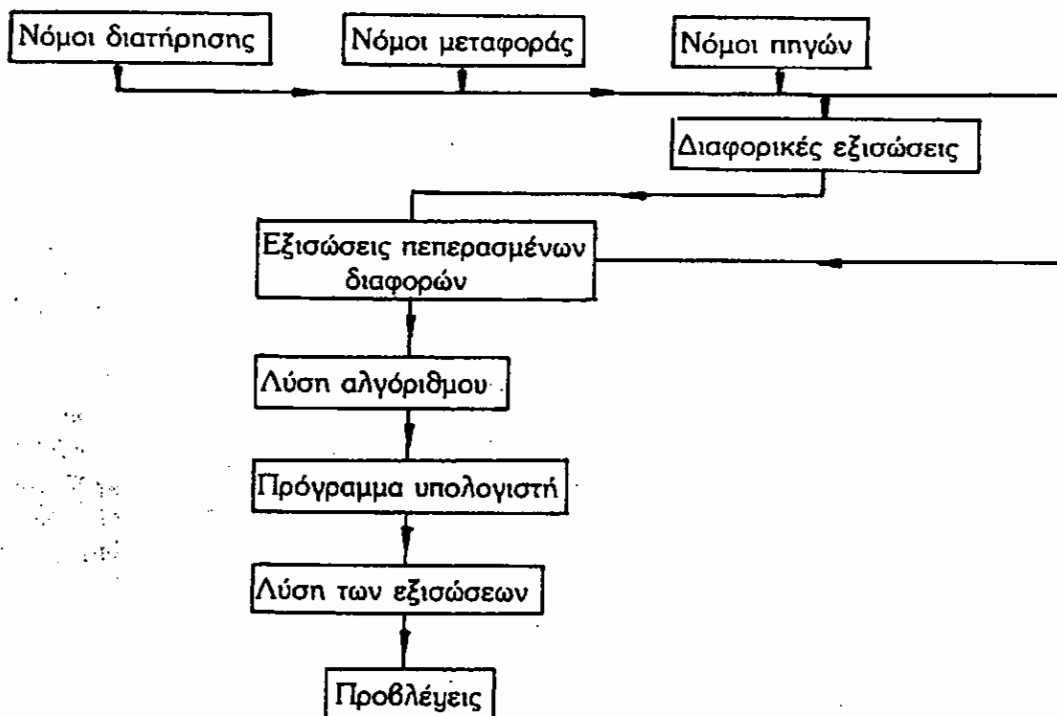
Περιπτώσεις εφαρμογής της μεθόδου:

- Στο πεδίο παραγωγής ισχύος είναι στους αεριοστρόβιλους, στις παλινδρομικές μηχανές, στους καυστήρες και στους πυρηνικούς αντιδραστήρες.
- Στις χημικές εγκαταστάσεις στους εναλλάκτες θερμότητας , υψικαμίνους.

- Σε μελέτες περιβάλλοντος πρόβλεψης ρύπων, διάθεσης θερμικών, χημικών και ραδιενεργών αποβλήτων στην ατμόσφαιρα, στα ποτάμια, κλπ.
- Στο πεδίο του διαστήματος στον υπολογισμό της οπισθέλκουσας και της άντωσης.
- Στην ψύξη-θέρμανση αερισμό κτιρίων, στην βελτίωση των συνθηκών διαβίωσης και στην φυσιολογία, στην πρόβλεψη της ροής του αέρα και αίματος δια των νεφρών και των αρτηριών.

1.3. ΜΑΘΗΜΑΤΙΚΗ ΔΟΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΙΚΩΝ ΚΩΔΙΚΩΝ

Η δομή της μαθηματικής διατύπωσης των υπολογιστικών κωδίκων ακολουθεί το παρακάτω διάγραμμα ροής.



Όπως φαίνεται στο διάγραμμα ροής οι υπολογιστικοί κώδικες έχουν τη βάση τους στους νόμους της φύσης, της διατήρησης (ορμής, μάζας και ενέργειας) της μεταφοράς και των πηγών. Οι νόμοι της φύσης μετασχηματίζονται ευθέως σε μορφή πεπερασμένων διαφορών κάνοντας χρήση της ανάλυσης της μεθόδου του όγκου-ελέγχου. Τείνοντας του αριθμού των κόμβων του πλέγματος στο άπειρο, η προσέγγιση των σχηματιζόμενων εξισώσεων πεπερασμένων διαφορών μπορεί να αντικαταστήσει αυτήν των διαφορικών εξισώσεων.

Για να καταστεί δυνατή η πρόβλεψη μέσω H/Y και να επιλυθούν οι εξισώσεις πεπερασμένων διαφορών είναι απαραίτητος ένας αλγόριθμός επίλυσης που να ενσωματώνεται κατάλληλα στο πρόγραμμα του υπολογιστή, να εκμεταλλεύεται την ταχύτητά του και να αποδίδει την φυσική πραγματικότητα.

1.4. ΕΞΙΣΩΣΕΙΣ ΔΙΑΤΗΡΗΣΗΣ - ΜΕΡΙΚΕΣ ΔΙΑΦΟΡΙΚΕΣ ΕΞΙΣΩΣΕΙΣ

Για να δειχθεί πως μπορούν να συνδυαστούν οι νόμοι της φύσης σε μια διαφορική εξίσωση λαμβάνεται για παράδειγμα η μεταφορά της ορμής. Σύμφωνα με το δεύτερο νόμο του Newton, για την κατάσταση της μόνιμης ροής (j_i) στην διεύθυνση i πρέπει να είναι ίσο με την καθαρή δύναμη στην αυτή διεύθυνση (S_i). Η μαθηματική έκφραση είναι: $j_{i,w} - j_{i,e} + j_{i,s} - j_{i,n} = -S_i$

Η μαθηματική έκφραση περιλαμβάνει ροές j , που παριστάνουν την μεταφορά της ορμής και με μεταφορά και με διάχυση (επενέργεια ιξώδους). Έχουν σαν αιτία τους νόμους μεταφοράς (νόμος ιξώδους του Newton). Βάσει του νόμου μεταφοράς, σε ένα νευτωνικό τυρβώδες ρευστό, η συνολική ροή είναι:

$$j_x = \rho U U - \mu_t \left(\frac{\partial U}{\partial x} \right) + \text{επιπρόσθετοι όροι} \quad (2.11)$$

Στην σχέση (2.11) υπάρχουν επίσης επιπρόσθετοι όροι (ή πηγές) που συνεισφέρουν στην μεταφορά της ορμής, που παράγονται από τους «νόμους της πηγής» και περιγράφουν την συνεισφορά που οφείλεται στην πίεση, στις ανωστικές δυνάμεις κτλ. Νόμος πηγών:

$$S_x = - \frac{\partial p}{\partial x} + S_x \quad (2.1.2)$$

Αντικαθιστώντας στην μαθηματική έκφραση του δευτέρου νόμου του Newton τους νόμους μεταφοράς και πηγών, λαμβάνουμε την διαφορική εξίσωση για την ορμή στην x-διεύθυνση:

$$\frac{\partial}{\partial x} (\rho U U) + \frac{\partial}{\partial y} (\rho U V) - \frac{\partial}{\partial x} \left(\mu_t \frac{\partial U}{\partial x} \right) - \frac{\partial}{\partial y} \left(\mu_t \frac{\partial U}{\partial y} \right) = - \frac{\partial p}{\partial x} + S_x \quad (2.1.3.)$$

Οι διαφορικές εξισώσεις για την ορμή στις άλλες διευθύνσεις, όπως και για άλλες διατηρούμενες ιδιότητες, λαμβάνονται κατά όμοιο τρόπο.

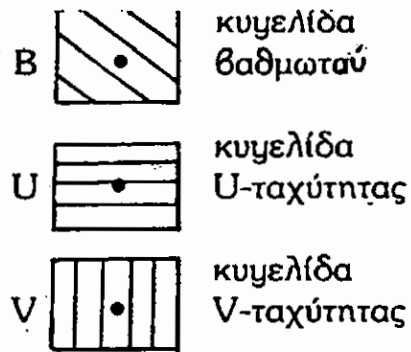
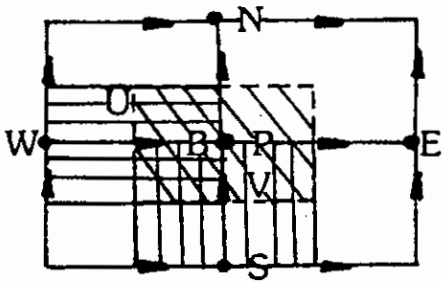
Η ομορφιά των εξισώσεων μεταφοράς στην διατήρηση των διαφόρων ιδιοτήτων (εκτός της μάζας), είναι ότι μπορούν να εκφραστούν με έναν γενικό τύπο, που για διδιάστατα προβλήματα σταθερής κατάστασης (μόνιμης ροής), για κυλινδρικές συντεταγμένες είναι:

$$\frac{1}{r} \left[\frac{\partial}{\partial x} (\rho r U \Phi) + \frac{\partial}{\partial z} (\rho r V \Phi) - \frac{\partial}{\partial x} \left(r \Gamma \frac{\partial \Phi}{\partial x} \right) - \frac{\partial}{\partial z} \left(-G \frac{\partial \Phi}{\partial r} \right) \right] - S_\Phi = 0 \quad (2.1.4)$$

Το $\Phi = U, V, k, \varepsilon, T, m_j$, κτλ, το $\Gamma = \mu_t, \Gamma_k, \Gamma_\varepsilon, \Gamma_\tau$, κτλ. Το S_Φ παριστάνει τις πηγές σε σχέση με την μεταφορά της μεταβλητής Φ . Η εξίσωση της συνέχειας, ή αλλιώς διατήρησης της μάζας, έχει ειδική έκφραση και θα συζητηθεί στην συνέχεια, μετά την παραγωγή της εξίσωσης της διορθωτικής πίεσης. Για $r=1$ και $\theta r = \theta y$ πηγαίνουμε σε διδιάστατη επίπεδη ροή.

1.5. ΕΞΙΣΩΣΕΙΣ ΠΕΠΕΡΑΣΜΕΝΩΝ ΔΙΑΦΟΡΩΝ

Για την παραγωγή των εξισώσεων πεπερασμένων διαφορών από τις διαφορικές εξισώσεις πρέπει να αναπτυχθεί το κατάλληλο πλέγμα και θέσεις αποθήκευσης των μεταβλητών. Το χρησιμοποιούμενο πλέγμα στο επίπεδο $r-x$, είναι κανονικό ορθογώνιο, με τυχαίες αποστάσεις των κόμβων και δείχνεται με τις συνεχείς γραμμές:

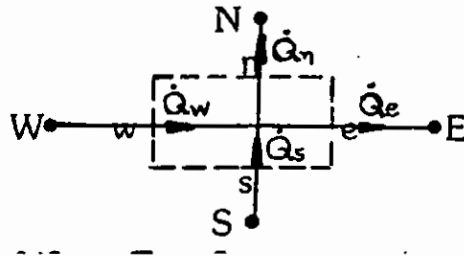


Τυπικά συμπλέγματα U, V και βαθμωτών κυψελίδων (ή όγκων ελέγχου) δείχνονται με τις διακεκομμένες γραμμές. Κάθε κυψελίδα περιβάλλει το σημείο τοποθέτησης της σχετικής μεταβλητής. Οι μεταβλητές αποθηκεύονται σε διαφορετικές θέσεις του πλέγματος. Η πίεση και τα βαθμωτά αποθηκεύονται στους κόμβους του πλέγματος, ενώ οι ταχύτητες στα όρια των κυψελίδων των βαθμωτών. Αυτό το σύστημα αποθήκευσης γνωστό σαν μετατοπισμένο «staggered» πλέγμα, έχει το πλεονέκτημα ότι οι μεταβλητές U, V, P αποθηκεύονται έτσι ώστε οι κλίσεις πίεσης που οδηγούν τις ταχύτητες U και V είναι εύκολο να εκτιμηθούν και επιπλέον οι ταχύτητες αποθηκεύονται εκεί όπου χρειάζονται για τον υπολογισμό της μεταφερόμενης ροής. Στις (.) θέσεις αποθηκεύονται οι βαθμωτές μεταβλητές P, k , ϵ , T, m_j , στις (\rightarrow) θέσεις η U ταχύτητα και στις (\uparrow) θέσεις η V ταχύτητα.

Η προσέγγιση με την μέθοδο του όγκου ελέγχου (ή κυψελίδας) είναι όμοια με την ολοκληρωτική μέθοδο, αλλά έχει

περισσότερο φυσική. Η τιμή κάποιας ιδιότητας Φ που αναφέρεται στο σημείο του κόμβου αναφέρεται στην μέση τιμή του όγκου ελέγχου. Ο νόμος διατήρησης για την μεταφορά κάποιας εκτατικής ιδιότητας Φ (μάζας, ορμής, ενέργειας, κτλ), μπορεί να οριστεί: (Η μεταβολή του Φ στην κυψελίδα) = (με τον καθαρό ρυθμό εισαγωγής του Φ στην κυψελίδα με μεταφορά) + (τον καθαρό ρυθμό εισαγωγής του Φ στην κυψελίδα με διάχυση) + (τον ρυθμό παραγωγής του Φ μέσα στην κυψελίδα). Και μαθηματικώς:

$$\frac{\Delta(\rho\Phi)}{\Delta t} dV + Q_w - Q_e + Q_s - Q_n + \int_V S_\Phi dV = 0$$



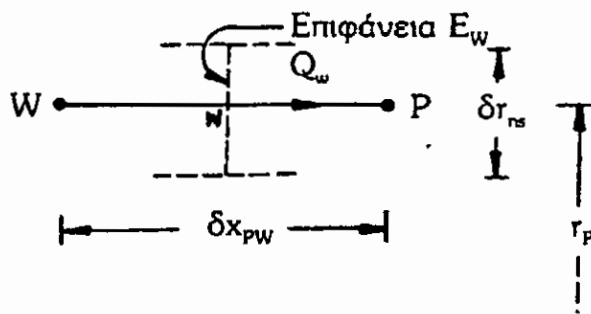
Τα w, e, s, n , παριστάνουν τα όρια των κυψελίδων. Τα Q_j την συνολική ροή λόγω μεταφοράς και διάχυσης, σαν άθροισμα γύρω από τα όρια των κυψελίδων, δίδοντας φυσική αντίληψη και τονίζοντας την διατήρηση. Ο όρος S_Φ παριστάνει την παραγωγή στη μονάδα του όγκου στην κυψελίδα και $\Phi = U, V, T, m_j, k, \epsilon$ ($\Phi = 1$ για την μάζα). $\Delta(\rho\Phi)/\Delta t = 0$, για ροή σταθερής κατάστασης (μόνιμη ροή).

Θεωρώντας χάριν ευκολίας μονοδιάστατη μεταφορά δια των ορίων της κυψελίδας, η «exact» μέθοδος επίλυσης του Spalding (1972), για το δυτικό όριο της κυψελίδας δίνει:

$$Q_w \approx \rho_w U_w E_w [F_w \phi_w + (1-F_w) \Phi_p] \quad f_w \equiv \frac{\exp(P_{ew})}{\exp(\zeta_{\mathcal{E}}) - 1}, \quad (\text{Αριθμός}$$

$$\text{Peclet}) P_{ew} \equiv \frac{\rho_w U_w \delta X_{pw}}{\Gamma_w}$$

$$A_w = \pi r \delta r_{ns}, \quad P_w = \frac{\rho_w \oplus p_-}{2}, \quad \Gamma_w = \frac{\Gamma_w \oplus \Gamma_p}{2}$$



Το Q_w είναι το μεταφερόμενο βαθμωτό Φ υπό την έννοια της μέσης τιμής, που λαμβάνεται μέσω του συντελεστού ισοζύγισης (ο οποίος εξαρτάται από τον τοπικό αριθμό Peclet). Εάν η πυκνότητα ρ και ο συντελεστής διάχυσης Γ δεν είναι αποθηκευμένα σε ομοιόμορφα πλέγματα, χρησιμοποιούνται ισοζυγισμένες τιμές προς επιβεβαίωση της συνέχειας της ροής.

Προς αποφυγή των «ακριβών υπολογιστικά» εκθετικών σχέσεων, υιοθετείται μία μέθοδος που χρησιμοποιεί την «piece-wise» (Patankar, 1980) γραμμική προσέγγιση, για τον υπολογισμό της «exact» $Q_w \approx P_{ew}$ σχέσης (με μικρή απώλεια ακριβείας). Σύμφωνα με αυτήν την μέθοδο χρησιμοποιείται μια «central» μέθοδος διαφορών για χαμηλό αριθμό P_{ew} (Peclet) και μία «upwind» μέθοδος διαφορών (ασυμπτωματικά της upwind σχέσης) για μεγάλο αριθμό P_{ew} . Για αυτό και η μέθοδος ονομάζεται μεικτή (hybrid) μέθοδος:

$$\frac{Q_w}{\rho_w U_w E_w} = \left[\frac{1}{2} \left[(1 \oplus 2P_{ew}^{-1}) \Phi_w \oplus (1 - 2P_{ew}^{-1}) \Phi_p \right] \right] \quad \text{για } -2 \leq P_{ew} \leq 2$$

$$\Phi_w \quad \text{για } P_{ew} \geq 2$$

Φ_P για $R_{EW} \leq -2$

Τα Q_e , Q_n και Q_s παράγονται κατά όμοιο τρόπο.

1.6. ΟΡΟΣ ΠΗΓΗΣ

Η συνολική παραγωγή στον όγκο ελέγχου δεν μπορεί να εκφρασθεί επακριβώς δίχως να γνωρίζουμε την ακριβή έκφραση του όρου πηγής S_Φ . Παρ' όλα αυτά μπορούμε να της δώσουμε μια γραμμικοποιημένη μορφή:

$$-\int_V S_\Phi dV = b\Phi_P + C$$

b και c παράγονται κατά την ολοκλήρωση και γραμμικοποίηση του όρου πηγής S_Φ , και είναι γενικώς συναρτήσεις του Φ . Αυτός ο τρόπος προσέγγισης δίδει πλεονεκτήματα και ευκολία στην χρήση στο υπολογιστικό πρόγραμμα, στις διάφορες ροϊκές καταστάσεις.

1.7. ΤΕΛΙΚΗ ΕΞΙΣΩΣΗ ΠΕΠΕΡΑΣΜΕΝΩΝ ΔΙΑΦΟΡΩΝ

Για την περίπτωση ροής σταθερής κατάστασης με αντικατάσταση στον νόμο της διατήρησης των εκφράσεων της ροής και της παραγωγής, παράγουμε και με την βοήθεια της συνέχειας την τελική εξίσωση πεπερασμένων διαφορών:

$$(a_P - b)\Phi_P = \sum_j a_j \Phi_j + C$$

a_n , a_s , a_e και a_w συνδυάζουν συντελεστές

μεταφοράς διάχυσης.

$a_P = \sum_j a_j$ $\sum_j =$ άθροισμα των γειτονικών N, S, E,

W.

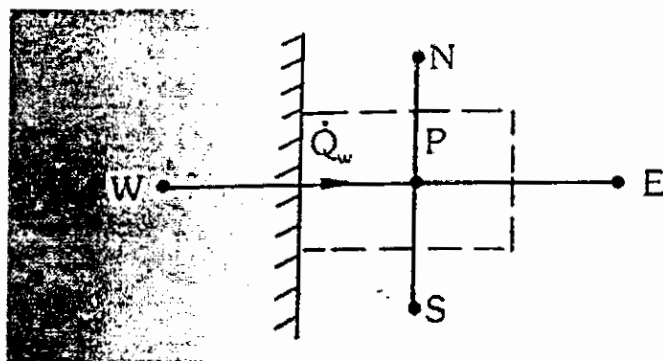
$$\alpha_w = p_w U_w E_w f_w, \quad \alpha_N = p_n U_n E_n f_n$$

$$\alpha_s = p_s U_s E_s f_s, \quad \alpha_E = p_e U_e E_e f_e$$

Με την βοήθεια της συνέχειας το α_p εκφράζει το άθροισμα των συνδιαζόμενων συντελεστών ροής στους κόμβους N, S, E, W. Όταν $b = c = 0$, το Φ_p παριστάνει την μέση τιμή του αθροίσματος των γειτονικών κόμβων.

1.8. ΕΙΣΑΓΩΓΗ ΟΡΙΑΚΩΝ ΣΥΝΘΗΚΩΝ

Η γενική εξίσωση πεπερασμένων διαφορών δεν είναι εφαρμόσιμη στα όρια της περιοχής υπολογισμών. Απαιτείται ειδική μεταχείριση στις κυψελίδες δίπλα στα όρια, ώστε να υπάρχει πλεονέκτημα τόσο στον νόμο της διατήρησης όσο και στον υπολογισμό της ροής. Δείχνεται στο παρακάτω σχήμα τυπική κυψελίδα που το δυτικό όριό της συμπίπτει με τοίχωμα.



Σύμφωνα με αυτή την διεύθυνση υπάρχει σύνδεση μεταξύ Φ_p και Φ_w στην γενική εξίσωση πεπερασμένων διαφορών. Διακόπτεται η σύνδεση μεταξύ των Φ_p και Φ_w θέτοντας τον συντελεστή $\alpha_w = 0$. Επίσης χρειάζεται να επέμβουμε στην ροή Q_w . Οι ροές Q_n , Q_s , και Q_e σύμφωνα με το σχήμα παραμένουν

ανεπηρέαστες. Υπάρχουν διάφοροι τρόποι επέμβασης στο Q_w . Εδώ υιοθετείται η μεταχείριση της “False” (λάθος) πηγής με καθορισμό των σταθερών b και c (εύκολα στον προγραμματισμό).

Εάν θέλουμε να εισάγουμε την οριακή ροή Q_o θέτουμε:

$$\alpha_w = 0, b = 0, c = Q_o$$

Εάν θέλουμε να εισάγουμε την οριακή τιμή Φ_o πρέπει:

$$Q_w = \alpha'_w (\Phi_o - \Phi_p)$$

και θέτουμε:

$$\alpha_w = 0, b = \alpha'_w = 0, c = \alpha'_w \Phi_o$$

Εάν το σχετικό όριο της περιοχής των υπολογισμών είναι τοίχωμα το α'_w πρέπει να εκτιμηθεί από τις συναρτήσεις τοίχου, ή από άλλο μοντέλο που περιγράφει την ροή κοντά στον τοίχο.

Πολλές φορές το Φ χρειάζεται να έχει μια σταθερή τιμή μέσα στην περιοχή υπολογισμών (δευτερεύουσα δέσμη έγχυσης μέσα στην περιοχή υπολογισμών). Η μεταχείριση της “False” πηγής είναι ένα πολύ χρήσιμο εργαλείο σε αυτές τις περιπτώσεις. Θέτουμε:

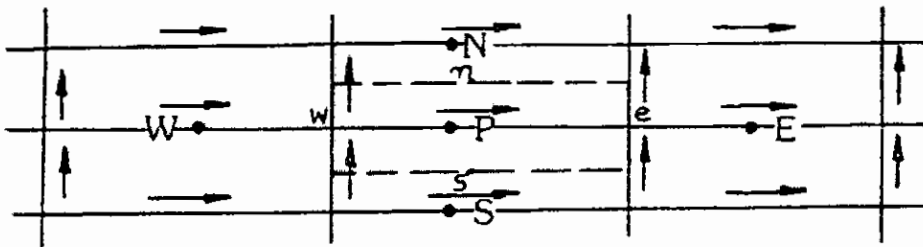
$$b = -\gamma, c = \gamma \Phi_{\beta\chi}$$

όπου γ (\equiv μεγάλος αριθμός), π.χ. 10^{30} και $\Phi_{\beta\chi} \equiv$ η επιθυμούμενη σταθερή τιμή μέσα στην περιοχή υπολογισμών.

1.9. ΕΞΙΣΩΣΗ ΠΕΠΕΡΑΣΜΕΝΩΝ ΔΙΑΦΟΡΩΝ ΓΙΑ ΤΗΝ ΟΡΜΗ

Η προηγούμενη εξίσωση πεπερασμένων διαφορών που έχει παραχθεί στηρίχθηκε σε βαθμωτές μεταβλητές. Οι εξισώσεις πεπερασμένων διαφορών για την ορμή παράγονται όμοια με μόνη εξαίρεση την μετατόπιση του όγκου ελέγχου επειδή και οι ταχύτητες είναι μετατοπισμένες. Η U-εξίσωση που αναφέρεται στην κυψελίδα είναι:

$$(\alpha_p - b)U_P = \sum_i \alpha_i U_i + E_{ew} (P_w - P_p) + c$$



$$\alpha_w = \rho_w U_w E_{ew} f_w, E_{ew} = \Gamma_p \delta \Gamma_{ns}, f_w = f_{\text{Hybrid-Difference}} (R_{ew})$$

$$R_{ew} = \frac{\rho_w U_w \delta x_{pw}}{\mu_w}, \rho_w U_w = \frac{1}{2} (\rho_w U_w + \rho_p U_p)$$

Για τις πιέσεις θα αναφερθούμε στο κεφάλαιο της εξίσωσης της διορθωτικής πίεσης. Οι ταχύτητες στα όρια της κυψελίδας, οι πυκνότητες κ.λ.π. υπολογίζονται με παρεμβολή, ώστε να ικανοποιείται η συνέχεια για την συνολική ροή.

1.10. ΕΠΙΛΥΣΗ ΕΞΙΣΩΣΕΩΝ ΠΕΠΕΡΑΣΜΕΝΩΝ

ΔΙΑΦΟΡΩΝ

Περιγράφεται η γενική «Line by Line» (LBL), επαναληπτική διαδικασία επίλυσης όλων των εξισώσεων πεπερασμένων διαφορών και ένας ειδικός αλγόριθμος (SIMPLE) για τις υδροδυναμικές εξισώσεις.

1.11. LBL ΕΠΙΛΥΣΗ ΕΞΙΣΩΣΕΩΝ ΠΕΠΕΡΑΣΜΕΝΩΝ

ΔΙΑΦΟΡΩΝ ΜΕ ΧΡΗΣΗ ΤΟΥ TDMA ΑΛΓΟΡΙΘΜΟΥ

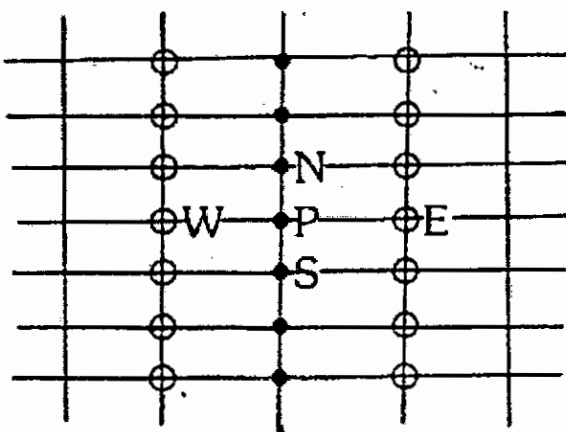
Γενικά η Line-By-Line διαδικασία είναι μια επαναληπτική μέθοδος, με αρχική υπόθεση των τιμών του πεδίου λύσης και βελτίωση της λύσης από γραμμή σε γραμμή.

Κατά την λύση των εξισώσεων για τα σημεία της ίδιας γραμμής (π.χ. γραμμή N-S) μετασχηματίζεται σε τέτοια μορφή ώστε μόνο τρεις τιμές (Φ_P , Φ_N και Φ_S) να είναι άγνωστες.

$$\alpha'_p \Phi_p = \alpha_N \Phi_N + A_S \Phi_S + c'$$

$$c' = \alpha_w \Phi_w + \alpha_e \Phi_e + c$$

$$\alpha'_p = \alpha_p - b$$



Το σύστημα των εξισώσεων για όλα τα σημεία της N-S γραμμής παίρνει μια ιδιαίτερα απλή μορφή και ο πίνακας των μη μηδενικών συντελεστών είναι τριδιαγώνιος (tri-diagonal). Γενικά τα Φ_1 και Φ_{i+1} είναι γνωστά στις εφαρμογές.

$$\begin{array}{rcl}
 -\beta_2 \Phi_1 + D_2 \Phi_2 - \alpha_2 \Phi_3 & & = c_2' \\
 -\beta_3 \Phi_2 + D_3 \Phi_3 - \alpha_3 \Phi_4 & & = c_3' \\
 \vdots & & \vdots \\
 -\beta_j \Phi_{j-1} + D_j \Phi_j - \alpha_j \Phi_{j+1} & & = c_j' \\
 \vdots & & \vdots \\
 -\beta_i \Phi_{i-1} + D_i \Phi_i - \alpha_i \Phi_{i+1} & & = c_i'
 \end{array}$$

$$D \equiv \alpha' p, \quad \alpha \equiv \alpha_N, \quad \beta \equiv \alpha_S, \quad \Phi_1, \quad \Phi_{j+1} \equiv \text{γνωστά}$$

Εξισώσεις αυτού του τύπου επιλύονται εύκολα με τον TDMA (Tri-Diagonal Matrix Algorithm) αλγόριθμο, από τα σημεία $j=2$ στο $j=1$ στην γραμμή N-S.

Για τις ανάγκες του TDMA αλγόριθμου, το σύστημα των εξισώσεων με αλγεβρικό χειρισμό μετατρέπεται σε γενικές επαναληπτικές σχέσεις για το Φ_j και τους συντελεστές A_j και C_j '. Χειριζόμενοι καταλλήλως την j -οστή εξίσωση λαμβάνουμε:

$$\Phi_j = Q_j \Phi_{j+1} + R_j \Phi_{j-1} + Z_j$$

Όπου:

$$Q_j = \alpha_j / D_j, \quad R_j = \beta_j / D_j, \quad Z_j = C_j / D_j$$

Οι εξισώσεις γίνονται:

$$\Phi_2 = Q_2 \Phi_3 + R_2 \Phi_1 + Z_2 \quad (\text{I})$$

$$\Phi_3 = Q_3 \Phi_4 + R_3 \Phi_2 + Z_3 \quad (\text{II})$$

.....
.....

Το Φ_j είναι γνωστό. Απαλοίφοντας το Φ_2 από την (ii) και το Φ_3 από την (iii) κ.ο.κ., παράγεται ένας γενικός τύπος για το Φ_j :

$$\Phi_j = A_j \Phi_{j+1} + C''_j$$

Όπου:

$$A_j = \frac{\alpha_\xi}{D_j - \beta_j A_{j-1}}, C''_j = \frac{\beta_j C''_{j-1} + C'_j}{D_j - \beta_j A_{j-1}}$$

Σημειωτέον: $A_1=0, C''_j=\Phi_1$

Με την εφαρμογή του TDMA αλγορίθμου στην γραμμή N-S, υπολογίζονται από τις επαναληπτικές σχέσεις τα A_1 και C''_j από $j=2$ έως $j=n$. Από την γενική επαναληπτική σχέση λαμβάνονται τα Φ_j ξεκινώντας με το Φ_n και τελειώνοντας με το Φ_2 (Φ_1, Φ_{n+1} γνωστά). Εφαρμόζοντας τον TDMA αλγόριθμο σε όλο το πεδίο ο υπολογισμός ξεκινάει π.χ. από την ακρότατη γραμμή N-S. Στην συνέχεια ο υπολογισμός επαναλαμβάνεται κατά μήκος των επόμενων γειτονικών γραμμών N-S κάνοντας χρήση τις πρόσφατες υπολογισθείσες τιμές Φ_j δια της ενσωμάτωσης των στο C' . Όλο το πλέγμα σαρώνεται (σάρωση = κίνηση από μία γραμμή πλέγματος σε άλλη) και ενδέχεται να κάνουμε χρήση πολλών σαρώσεων για να επιτυχθεί η επιθυμητή λύση. Αποκλίσεις της κατεύθυνσης των διασχίσεων (διάσχιση = κίνηση κατά μήκος μιας καθορισμένης γραμμής πλέγματος) και των σαρώσεων είναι δυνατές.

1.12. SIMPLE ΑΛΓΟΡΙΘΜΟΣ

Οι άγνωστες μεταβλητές προς επίλυση είναι οι κύριες υδροδυναμικές μεταβλητές U, V, P και οι επιπρόσθετες βαθμωτές μεταβλητές k, e, T, m κ.τ.λ. Κάθε άγνωστη απαιτεί

προς επίλυση μια εξίσωση. Οι βαθμωτές μεταβλητές ικανοποιούν αυτήν την απαίτηση. Και οι ταχύτητες U, V επίσης ικανοποιούν αυτήν την απαίτηση (με τις εξισώσεις της ορμής). Η πίεση όμως δεν έχει εξίσωση. Υπάρχει μία επιπρόσθετη εξίσωση, η εξίσωση της συνέχειας, αλλά σ' αυτήν δεν υπάρχει ο όρος της πίεσης. Συνεπώς χρειάζεται ειδική μεθοδολογία για να ληφθεί η πίεση P . Η χρησιμοποιούμενη εδώ μεθοδολογία συνίσταται στην επίλυση των εξισώσεων της ορμής αρχικά, έχοντας εκτιμήσει ένα πεδίο πίεσης. Κατόπιν λήψεως των εκτιμώμενων ταχυτήτων U, V και τελικώς διορθώσεις του πεδίου πίεσης, έχοντας σε συμφωνία το πεδίο ταχυτήτων με την εξίσωση συνέχειας. Αυτή η διαδικασία επίλυσης είναι γνωστή σαν SIMPLE (Semi-Implicit Method for Pressure-Linked Equations) αλγόριθμος (Parankar and spakling, 1972).

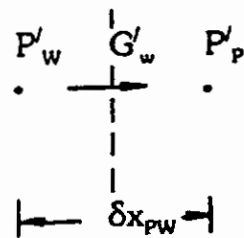
Αρχικά υποτίθεται το πεδίο της πίεσης P και λύνονται οι εξισώσεις της ορμής με την LBL μέθοδο και παράγονται αντίστοιχες ταχύτητες U^*, V^* . Οι μη σωστές τιμές των P', U' και V' απαιτούν διόρθωση P', U' και V' .

$$P = P^* + P', U = U^* + U', V = V^* + V', G = G^* + G'$$

Το μετατοπισμένο «staggered» σύστημα πλέγματος παρέχει πλεονέκτημα στις διορθώσεις των ταχυτήτων, ή της ροής (G'), με την έκφραση των G'_w, G'_e, G'_n, G'_s σαν συντελεστών χρονικών κλίσεων t' των P' . Χρησιμοποιούμε γραμμικοποιημένη σχέση ροής για την λήψη του G'_w σε όρους του P' :

$$G_w = \frac{f_w(P_P - P'_W)}{\delta x_{PW}}, f_w = -\rho^* \delta x_{PW} \frac{\partial U_w^*}{\partial (P_P - P'_W)}$$

$$G_w = \rho^* \frac{\partial U_w^*}{\partial (P'_W - P_P)} (P'_W - P_P)$$



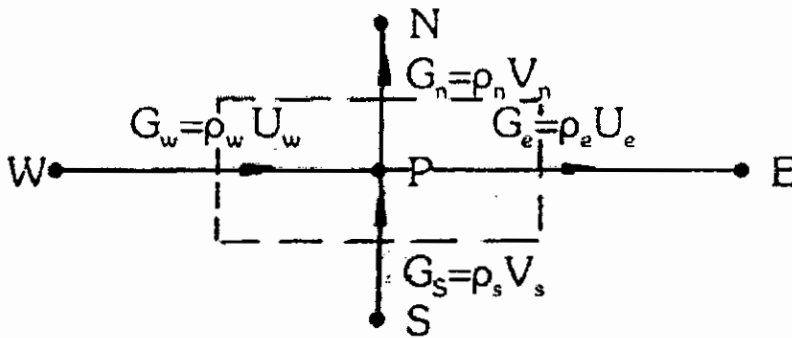
Χρησιμοποιώντας τις εξισώσεις της ορμής σε όρους των U^* , V^* και P^* , η έκφραση για το G'_w μετασχηματίζεται τελικά για ένα απλό τύπο, με τον συντελεστή D_w σε όρους των α_p και b :

$$D_w = \frac{\theta U^*_w}{\theta(P^*_w - P^*_p)} = \frac{E^{ew}}{(\alpha_p - b)}$$

$$G'_w = p^* D_w (P'_w - P'_p),$$

Για ασυμπίεστη ροή $G' = p^* U'$. Στην συμπιεστή ροή χρειάζεται προσοχή στον υπολογισμό των πυκνοτήτων. Εάν οι ταχύτητες είναι διορθωμένες, η εξίσωση διατήρησης της μάζας θα ικανοποιείται και η πηγή της μάζας S_m είναι μηδέν. Φυσικό στις αρχικά υποτιθέμενες ταχύτητες U' και V' και συνεπώς G' γενικώς δεν ικανοποιείται η συνέχεια και υπάρχει μια καθαρή πηγή μάζας. Για έναν τυπικό όγκο ελέγχου:

$$G_e E_j - G_w E_j + G_n E_j - G_s E_j = S_m \delta V$$



Ο σκοπός εδώ είναι να διορθωθούν ταχύτητες και πιέσεις έτσι ώστε να απαλειφθεί η πηγή μάζας. Αντικαθιστώντας $G_w = G' + G''$ κ.ο.κ. στην εξίσωση διατήρησης της μάζας, παράγεται μία εξίσωση Poisson για την διορθωτική P' .

$$(\alpha_p - b) P'_p = \sum_j \alpha_j P'_j + M_p + c$$

όπου:

$$\alpha_p = \sum_j \alpha_j, \quad \alpha_w = \rho_w D_w E_w \quad \text{κ.ο.κ.}$$

$$M_p - G^*_w E_w - G^*_e E_e + G^*_s E_e - G^*_n E_e \equiv \text{πηγή υπολειπόμενης μάζας σε σχέση με τις υποτιθέμενες ροές } G^*.$$

Επίλυση της διορθωτικής πίεσης P' με την LBL μέθοδο, συμπληρώνει την διαδικασία λήψης των διορθώσεων U' , V' και P' που απαιτούνται για τα U , V και P . Στα όρια των πεδίων λύσης, εάν υπάρχει ταχύτητα κάθετη στο όριο, δεν χρειάζονται διορθώσεις πίεσης. Π.χ. στο δυτικό όριο ο συντελεστής D_w πρέπει να είναι μηδέν και επιτυγχάνεται θέτοντας $\alpha_w=0$ στην εξίσωση της πίεσης:

$$U_w = U_{\text{οριο}} - U^*_{\text{οριο}} = D_w (P'_w - P'_p) = 0$$

Εάν δίδεται η οριακή πίεση π.χ. $P_w = P_{\text{οριο}}$ η διορθωτική πίεση P'_w είναι μηδέν. Τότε τα U_w και D_w λαμβάνονται κατά όμοιο τρόπο, ή από την εξίσωση της ορμής (π.χ. με γραμμικοποίηση της εξίσωσης Bernoulli ($P = P_{\text{οριο}} + \frac{1}{2} \rho U^2$):

$$P_w = P_{\text{οριο}}, \quad P'_w = 0$$

$$U_w = \alpha P_p + b, \quad U = \alpha P'_p$$

Τα διάφορα επί μέρους μέρη του SIMPLE αλγορίθμου που αναφέρθηκαν προηγούμενα συνδυάζονται τώρα με την επίλυση των εξισώσεων των μη υδροδυναμικών μεταβλητών, προς επίτευξη μιας συνολικά συνδυασμένης διαδικασίας επίλυσης. Υποτίθεται το πεδίο όλων των μεταβλητών (U , V , P , T , k , ε , κ.ο.κ.). Υπολογίζονται οι συντελεστές των εξισώσεων ορμής και επιλύονται οι βελτιωμένες τιμές U^* , V^* με την μέθοδο LBL, χρησιμοποιώντας επικρατούσες πιέσεις:

$$(\alpha_p - b)U^*_p = \sum_j U^*_j + E_{ew}(P^*_w - P^*_p) + c$$

Ενδέχεται να λάβουν χώρα περισσότερες της μιας σαρώσεις δίχως όμως αποχρονικοποιήσεις των συντελεστών. Σ' αυτό το σημείο ικανοποιούνται οι εξισώσεις της ορμής, αλλά όχι και η εξίσωση της συνέχειας. Στην συνέχεια υπολογίζονται οι συντελεστές της διορθωτικής εξίσωσης P' και επιλύεται η

εξίσωση αυτή με την μέθοδο LBL. Συνήθως για την εξίσωση διορθωτικής πίεσης απαιτούνται περισσότερες της μιας σαρώσεις δίχως αποχρονικοποίηση των συντελεστών. Κατόπιν υπολογίζονται οι διορθωτικές ταχύτητες U' και V' και P , U και V λαμβάνονται από τις σχέσεις:

$$P = P^* + P', U = U^* + U', V = V^* + V'$$

Σ' αυτό το σημείο ικανοποιείται επακριβώς η συνέχεια αλλά όχι και οι εξισώσεις ορμής. Στο επόμενο βήμα υπολογίζονται οι συντελεστές των μη υδροδυναμικών εξισώσεων και επιλύονται τα σχετικά βαθμωτά Φ με την μέθοδο LBL. Ο απαιτούμενος αριθμός σαρώσεων στο ίδιο χρονικό βήμα, εξαρτάται από την φύση του πρόβληματος.

Τελικά εκτελείται ένα τεστ σύγκλισης, που αν δεν είνει επιτυχές τότε τα προσφάτως ληφθέντα πεδία των μεταβλητών θεωρούνται υποτιθέμενα και επαναλαμβάνεται η διαδικασία μέχρι τελικής σύγκλισης.

Στην συνέχεια περιγράφεται συνοπτικά η μεθοδολογία του SIMPLE αλγορίθμου για την περίπτωση της δισδιάστατης μόνιμης ροής για καρτεσιανές συντεταγμένες.

Η εξίσωση είναι:

$$\frac{\partial \rho}{\partial t} + \frac{\partial \rho U}{\partial x} + \frac{\partial \rho v}{\partial y} + \frac{\partial \rho \omega}{\partial z} = 0$$

Για σταθερής κατάστασης (μόνιμη) δισδιάστατη ροή:

$$\frac{\partial \rho}{\partial t} = 0, \frac{\partial \rho \omega}{\partial z} = 0$$

: Η εξίσωση συνέχειας γίνεται

$$\frac{\partial \rho U}{\partial x} + \frac{\partial \rho v}{\partial y} = 0 \equiv \frac{\Delta \rho u}{\Delta x} + \frac{\Delta \rho v}{\Delta y} = 0$$

Με ολοκλήρωση στον όγκο ελέγχου:

$$\int_V \left(\frac{\partial \rho u}{\partial x} + \frac{\partial \rho v}{\partial y} \right) dV = 0 \Rightarrow (\Delta \rho u) \Delta y \Delta z + (\Delta \rho v) \Delta x \Delta z = 0 \Rightarrow ((\rho u)_e - (\rho u)_w) \Delta y \Delta z + ((\rho v)_n - (\rho v)_s) \Delta x \Delta z = 0$$

Χρησιμοποιώντας ένα μη-διορθωμένο πεδίο πίεσης p' αφ' ενός μεν ικανοποιούνται οι εξισώσεις ορμής με τον υπολογισμό των u' και v' , αλλά όχι και η εξίσωση της συνέχειας. Ισχύει:

$p = p^* + p'$ $p =$ πραγματική, $p^* =$ υποτιθέμενη, $p' =$ διορθωτική πίεση.

Οι ταχύτητες μπορούν να διορθωθούν μέσω των σχέσεων:

$$U = u^* + u', v = v^* + v'$$

Παράγονται οι εξισώσεις διορθωτικής ταχύτητας με αφαίρεση της πραγματικής λύσης από την αρχική υποτιθέμενη:

Εάν τεθεί ίσος με μηδέν ο όρος $\Sigma \alpha^1 u'$ δίδει έμμεσα στην εξίσωση λύση ορθή (ισχύει η εξίσωση σε περίπτωση σύγκλισης).

Ο τύπος της διορθωτικής ταχύτητας:

μπορεί να γραφεί και:

Αντικατάσταση της πραγματικής ταχύτητας στην εξίσωση συνέχειας:

$$[p_e(u^*_e + u'_e) - p_w(u^*_e + U'_e)] \Delta y \Delta z + [p_n(u^*_n + u'_n) - p_s(u^*_s + u'_s)] \Delta x \Delta z = 0$$

Αντικατάσταση διορθωτικών ταχυτήτων σε όρους διορθωτικών πιέσεων:

$$0 = \Delta x \Delta z \{ p_e [u^*_e + d_e (p'_p - p'_e)] - p_w [u^*_w + d_w (p'_w - p'_p)] \} +$$

$$\Delta x \Delta z \{ p_n [u^*_n + d_n (p'_p - p'_n)] - p_s [u^*_n + d_n (p'_n - p'_p)] \}$$

Καταλήγουμε στην τελική έκφραση για την εξίσωση διορθωτικής πίεσης Σ

$$\begin{aligned} \alpha_E &= \rho_e d_e \Delta y \Delta z \\ \alpha_w &= \rho_w d_w \Delta y \Delta z \\ \alpha_s &= \rho_s d_s \Delta x \Delta z \\ \alpha_N &= \rho_n d_n \Delta y \Delta z \\ \alpha_p &= \alpha_e + \alpha_w + \alpha_s + \alpha_n \\ b &= (-\rho_e u_e^* + \rho_w u_w^*) \Delta y \Delta z + (-\rho_n u_n^* + \rho_s u_s^*) \Delta x \Delta z \end{aligned}$$

Και σε περίπτωση ύπαρξης και του χρονικού όρου στην

$$\frac{(\rho_p - \rho_p^o) \Delta x \Delta y}{\Delta t}$$

εξίσωση συνέχειας:

Ο όρος b γίνεται:

$$b = \frac{(\rho_p - \rho_p^o) \Delta x \Delta y}{\Delta t} + (\rho_w u_w^* - \rho_e u_e^*) \Delta y \Delta z + (\rho_s u_s^* - \rho_n u_n^*) \Delta x \Delta z$$

1.13. ΣΥΓΚΛΙΣΗ ΜΕΘΟΔΟΥ

Όλες οι εξισώσεις ικανοποιούν συνθήκες για σύγκλιση του πίνακα (Scarborough, 1930):

$$|\alpha_p - b| \leq \sum_1 |\alpha_1|,$$

με $b \leq 0$

Κατά την διαδικασία επίλυσης η σύγκλιση προσδιορίζεται στο τέλος κάθε επανάληψης, με βάση το κριτήριο της «υπολειπόμενης πηγής», σύμφωνα με το οποίο συγκρίνονται οι «υπολειπόμενες πηγές» κάθε εξίσωσης πεπερασμένων διαφορών με κάθε τιμή αναφοράς $R_{\Phi, αναφ}$, ($R_{\Phi, αναφ}$ = μία πολύ μικρή τιμή).

Με την χρήση μιας κατάλληλης μεθόδου υποχαλάρωσης για μια επαναληπτική διαδικασία, μπορεί να βελτιωθεί η

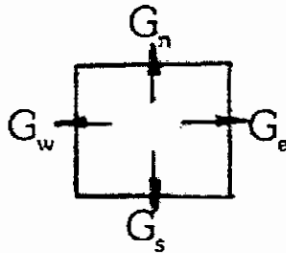
$$\Phi_P^{NEW} = f \Phi_P + (1-f) \Phi_P^{OLD}$$

σύγκλιση και πολλές φορές αποφεύγεται η απόκλιση. Οι εξισώσεις που λύνονται είναι μη-γραμμικές και είναι απαραίτητη υποχαλάρωση (under-relaxation):

F =συντελεστής υποχαλάρωσης, Φ_p^{NEW} =τωρινή μεταβλητή με υποχαλάρωση, Φ_p = τωρινή μεταβλητή, Φ_p^{OLD} =μεταβλητή προηγούμενης επανάληψης.

Εάν οι ροές μάζας δεν ικανοποιούν την συνέχεια ενδέχεται να ανακύψει μια κατάσταση όπου όλα τα α_i να είναι μηδέν. Οι εξισώσεις πεπερασμένων διαφορών παίρνουν μορφή:

$$AP = \sum_i \alpha_i$$



Η λύση είναι να προστεθεί μία «λάθος» (false) πηγή, δια της μεθόδου της γραμμικοποιημένης πηγής. Η τελική τότε εξίσωση πεπερασμένων διαφορών έχει επιπρόσθετες σταθερές τις b_1 και c_1 . Η γραμμικοποιημένη πηγή S_1 είναι:

$$S_f \left| m_{\text{καθαρό}} \right| (\Phi_p^{OLD} - \Phi_p = b_f \Phi_p + c_f$$

Όπου $m_{\text{καθαρό}} = \sum_i m_i$, με $m_w = G_w E_w$ κ.ο.κ. Ο τύπος της εξίσωσης πεπερασμένων διαφορών που πρέπει να λυθεί γίνεται:

$$A_p - b - b_f) \Phi_p = \sum_i \alpha_i \Phi_i + c + c_f$$

Αυτή η προσθήκη βοηθάει στην ευστάθεια της διαδικασίας επίλυσης χωρίς να έχει επίδραση στην τελική λύση.

1.14. ΑΚΡΙΒΕΙΑ ΜΕΘΟΔΟΥ

Η ακρίβεια της διαδικασίας επίλυσης γενικά είναι συνάρτηση της σύγκλισης και του αριθμού των χρησιμοποιούμενων κόμβων πλέγματος. Για κάθε διαμόρφωση ροής, αναζητείται λύση που να είναι ανεξάρτητη του πλέγματος, με αύξηση του αριθμού των γραμμών του πλέγματος μέχρις ότου να μην παρατηρείται παραπέρα μεταβολή της τελικής λύσης.

Κύρια πηγή λανθασμένης πρόβλεψης είναι η «λάθος» (false) διάχυση, που συμβαίνει όταν ο αριθμός Peclet είναι μεγάλος και η ροή είναι πλάγια στο πλέγμα (στην μέθοδο πεπερασμένων διαφορών υπολογίζεται το Φ σαν μέση τιμή των γειτονικών Φ). Θα μπορούσε σαν λύση να τεθεί το πλέγμα παράλληλο των ροϊκών γραμμών, ή να καταστούν όλοι οι αριθμοί Peclet μικροί.

1.15. ΤΥΡΒΩΔΕΣ ΜΟΝΤΕΛΟ ΔΥΟ ΕΞΙΣΩΣΕΩΝ

Σ' αυτό το κεφάλαιο παρουσιάζεται η ενσωμάτωση στην διαδικασία επίλυσης ενός τυρβώδους μοντέλου, για να ληφθεί λύση των εξισώσεων μέσων χρονικών τιμών της μέσης ροής, με την βοήθεια δύο τυρβωδών ποσοτήτων k και ϵ , που λαμβάνονται από τις εξισώσεις μεταφοράς των. Σύμφωνα με την θεώρηση των μέσων χρονικών τιμών Reynolds οι στιγμιαίες τιμές ταχυτήτων και βαθμωτών μεταβλητών αναλύονται στις μέσες τιμές και στις διακυμάνσεις των:

$$\hat{U}_i = U_i + u_i, \quad \Phi = \Phi + \phi'$$

Για ροές σταθερής κατάστασης και με την χρήση καρτεσιανών συντεταγμένων οι εξισώσεις μέσων χρονικών τιμών για την συνέχεια, ορμή και μεταφορά βαθμωτού λαμβάνουν την έκφραση:

$$\frac{\partial}{\partial X_i}(\rho U_i) = 0$$

$$\frac{\partial}{\partial X_i}(\rho U_j U_i) = \frac{\partial}{\partial X_j}(-\rho U_i U_j) - \frac{\partial P}{\partial X_i} + \frac{\partial}{\partial X_j} \left[\mu \left(\frac{\partial U_i}{\partial X_j} + \frac{\partial U_j}{\partial X_i} \right) \right] + S_{ui}$$

$$\frac{\partial}{\partial X_j}(\rho U_j \Phi) = \frac{\partial}{\partial X_j}(-\rho u_j \varphi') + \frac{\partial}{\partial X_j} \left(\frac{\mu}{\sigma_\phi} \frac{\partial \Phi}{\partial X_j} \right) + S_\phi$$

μ = στρωτό ιξώδες, σ_ϕ στρωτός αριθμός Prandtl/Schmidt. Δυστυχώς αυτές οι εξισώσεις περιέχουν άγνωστες τάσεις Reynolds $\rho u_j u_i$ και βαθμωτές ροές $\rho u_j \varphi'$. Αυτές οι τυρβώδεις διαχυτικές ροές παίζουν ένα σημαντικό ρόλο στον προσδιορισμό της συμπεριφοράς της ροής καθώς αν αντιπροσωπεύουν τις επιδράσεις στο επίπεδο μικρο-κλίμακας.

Η υιοθετούμενη μέθοδος για την λήψη ενός κλειστού συστήματος εξισώσεων είναι ένα μοντέλο « ενεργού » ιξώδους, στο οποίο οι άγνωστες τυρβώδεις διαχυτικές ροές εκφράζονται σε όρους βάσει της « υπόθεσης κλίσης μεταφοράς » (Hinge, 1959), στην οποία οι ροές υποτίθενται ανάλογες των κλίσεων των μέσων ιδιοτήτων της ροής. Οι σταθερές της αναλογίας είναι το μ_t ή το $\mu_t / \sigma_{\phi,t}$.

$$-\rho U_i U_j = \mu_t \left(\frac{2U_i}{2X_j} + \frac{2U_j}{2X_i} \right), \quad -\rho u_j \varphi' = \frac{\mu_t}{\sigma_\phi} \frac{\partial \Phi}{\partial X_j}$$

μ_t = τυρβώδες ιξώδες, $\sigma_{\phi,t}$ = ενεργός αριθμός Prandtl/Schmidt.

Το $\sigma_{\phi,t}$ υποτίθεται συχνά γνωστό και από την διαστατική ανάλυση το μ_t συνάγεται ότι είναι συνάρτηση της τυρβώδους κινητικής ενέργειας k και του ρυθμού σκέδασής της ϵ . k και ϵ τα παίρνουμε από τις εξισώσεις μεταφοράς των, γι' αυτό και ονομάζεται τυρβώδες μοντέλο k - ϵ , δύο

$$\text{εξισώσεων: } \mu_t = C_\mu \rho \frac{k^2}{\epsilon}$$

C_μ = συντελεστής τριβής, βάσει πειραματικών μετρήσεων $C_\mu = 0,09$.

1.16. ΕΞΙΣΩΣΕΙΣ ΜΕΣΩΝ ΧΡΟΝΙΚΩΝ ΤΙΜΩΝ ΣΤΗΝ ΤΥΡΒΩΔΗ ΡΟΗ

Δίδονται οι εξισώσεις μέσω χρονικών τιμών για την συνέχεια, ορμή και μεταφορά βαθμωτού για διδιάστατες, σταθερής κατάστασης τυρβώδεις αξονοσυμμετρικές (ή επίπεδες, $r = 1$) ροές:

Συνέχεια:

$$\frac{\partial}{\partial X}(r\rho U) + \frac{\partial}{\partial r}(r\rho V) = 0$$

Ορμή:

$$\frac{1}{r} \left[\frac{\partial}{\partial X}(r\rho U U) + \frac{\partial}{\partial r}(r\rho V U) \right] = -\frac{\partial P}{\partial X} + \frac{1}{r} \left[\frac{\partial}{\partial X}(r\mu_{eff} \frac{\partial U}{\partial X}) + \frac{\partial}{\partial r}(r\mu_{eff} \frac{\partial U}{\partial r}) \right] + S_u$$

$$\frac{1}{r} \left[\frac{\partial}{\partial X}(r\rho U V) + \frac{\partial}{\partial r}(r\rho V V) \right] = \frac{\partial P}{\partial r} + \frac{1}{r} \left[\frac{\partial}{\partial X}(r\mu_{eff} \frac{\partial V}{\partial X}) + \frac{\partial}{\partial r}(r\mu_{eff} \frac{\partial V}{\partial r}) - \mu_{eff} \frac{V}{r^2} \right] + S_v$$

$$S_u = \frac{\partial}{\partial X}(\mu_{eff} \frac{\partial U}{\partial X}) + \frac{1}{r} \frac{\partial}{\partial r}(r\mu_{eff} \frac{\partial V}{\partial r})$$

$$S_v = \frac{\partial}{\partial X}(\mu_{eff} \frac{\partial U}{\partial r}) + \frac{1}{r} \frac{\partial}{\partial r}(r\mu_{eff} \frac{\partial V}{\partial r}) - \mu_{eff} \frac{V}{r^2}$$

$$\mu_{eff} = \mu + \mu_t, \quad \Gamma_{eff} = \frac{\mu}{\sigma\Phi} + \frac{\mu_t}{\sigma\Phi_t}$$

Μεταφορά Βαθμωτού:

$$\frac{1}{r} \left[\frac{\partial}{\partial X}(r\rho U\Phi) + \frac{\partial}{\partial r}(r\rho V\Phi) \right] = \frac{1}{r} \left[\frac{\partial}{\partial X}(r\Gamma_{eff} \frac{\partial \Phi}{\partial X}) + \frac{\partial}{\partial r}(r\Gamma_{eff} \frac{\partial \Phi}{\partial r}) \right] + S_\Phi$$

Εδώ τα μ_{eff} και Γ_{eff} είναι οι ενεργοί συντελεστές ανταλλαγής, που αναπαριστούν το άθροισμα της στρωτής και της τυρβώδους μεταφοράς. Σε υψηλούς αριθμούς Reynolds (πλήρης τυρβώδης ροή) οι επιδράσεις της μοριακής μεταφοράς μ και Γ είναι αμελητέες και παραλείπονται στις εξισώσεις. Στις εκφράσεις S_u , S_v παραλείπονται επιπρόσθετοι όροι που σχετίζονται με μη-ομοιόμορφο ιξώδες και που η επίδρασή τους αρχίζει να γίνεται σημαντική για σημαντικές αλλαγές των ιδιοτήτων του ρευστού.

Οι απαραίτητες εξισώσεις για την τυρβώδη κινητική ενέργεια k και τον ρυθμό σκέδασής της ϵ , που συμπληρώνουν τις εξισώσεις μέσω χρονικών τιμών για διδιάστατη, σταθερής κατάστασης αξονοσυμμετρική ροή είναι:

Τυρβώδης ενέργεια k:

$$\frac{1}{r} \left[\frac{\partial}{\partial X} (r\rho U k) + \frac{\partial}{\partial r} (r\rho V k) \right] = \frac{1}{r} \left[\frac{\partial}{\partial X} \left(r \frac{\mu_{eff}}{\sigma_k} \frac{\partial k}{\partial X} \right) + \frac{\partial}{\partial r} \left(r \frac{\mu_{eff}}{\sigma_k} \frac{\partial k}{\partial r} \right) \right] + \underbrace{G - C_D \rho \varepsilon}_{S_k}$$

Ρυθμός σκέδασης ενέργειας ε:

$$\frac{1}{r} \left[\frac{\partial}{\partial X} (r\rho U \varepsilon) + \frac{\partial}{\partial r} (r\rho V \varepsilon) \right] = \frac{1}{r} \left[\frac{\partial}{\partial X} \left(r \frac{\mu_{eff}}{\sigma_\varepsilon} \frac{\partial \varepsilon}{\partial X} \right) + \frac{\partial}{\partial r} \left(r \frac{\mu_{eff}}{\sigma_\varepsilon} \frac{\partial \varepsilon}{\partial r} \right) \right] + \underbrace{C_1 \frac{\varepsilon}{k} G - C_2 \rho \frac{\varepsilon^2}{k}}_{S_\varepsilon}$$

όπου: $G = \mu_i \left\{ 2 \left[\left(\frac{\partial U}{\partial X} \right)^2 + \left(\frac{\partial V}{\partial r} \right)^2 + \left(\frac{V}{r} \right)^2 \right] + \left(\frac{\partial U}{\partial r} + \frac{\partial V}{\partial X} \right)^2 \right\} + S_G$

$$S_G = -\frac{2}{3} \mu_i \left[\frac{1}{r} \frac{\partial}{\partial r} (rV) + \frac{\partial U}{\partial X} \right]^2$$

Οι σταθερές (Launder και Spalding, 1974):

Φαίνεται η ομοιότητα αυτών των εξισώσεων με εκείνες της μέσης ροής

με την αντικατάσταση $S_k = G - C_D \rho \varepsilon$ και $S_\varepsilon = C_1 \frac{\varepsilon}{k} G - C_2 \rho \frac{\varepsilon^2}{k}$

Το G παριστάνει την παραγωγή του k από την μέση ροή, μέσω της τυρβώδους διατμητικής τάσης και για να είμαστε ακριβείς, το ε είναι ο ρυθμός της σκέδασης του ιξώδους του k σε θερμότητα από τις πολύ μικρές τυρβώδεις δίνες. Οι συντελεστές C και οι αριθμοί Prandtl σ, είναι γενικά εμπειρικές συναρτήσεις, αλλά λαμβάνονται σαν σταθερές για υψηλούς αριθμούς Reynolds. Το S_G έχει και άλλους όρους παραγωγής, που οι επιδράσεις τους είναι μικρές εκτός ροών μη-ομοιόμορφων ιδιοτήτων.

1.17. ΟΡΙΑΚΕΣ ΣΥΝΘΗΚΕΣ

Στην είσοδο της υπολογιστικής περιοχής της ροής οι μεταβλητές $U, V, \Phi, k, \varepsilon$, μπορεί να καθοριστούν από την καλή γνώση της ιδιαίτερης κατάστασης της ροής (πειραματικές μετρήσεις), ή να εκτιμηθούν. Π.χ. ο ρυθμός σκέδασης ε μπορεί να εκτιμηθεί από την διαστατική ανάλυση, βασιζόμενοι στο γεγονός ότι η τυρβή χαρακτηρίζεται από την ενέργεια της k και μία κλίμακα μήκους L , που παριστάνει το μέγεθος των τυρβωδών δινών ($\varepsilon \approx k^{\frac{3}{2}}/L$).

Στην έξοδο της υπολογιστικής περιοχής (για μεγάλους αριθμούς Reynolds), ο προσδιορισμός των μεταβλητών δεν είναι σημαντικός. Η συνήθης πρακτική είναι να θέτουμε κάθετες κλίσεις ίσες με μηδέν και να λαμβάνουμε τις ταχύτητες εξόδου από το ισοζύγιο μάζας. Κοντά στον τοίχο ο τοπικός Reynolds γίνεται πολύ μικρός και το τυρβώδες μοντέλο ανεπαρκές (είναι σχεδιασμένο για υψηλούς αριθμούς Reynolds). Αυτό σε συνδυασμό με την απότομη μεταβολή των μεταβλητών κοντά στον τοίχο κάνει προσεκτική την εκλογή της θέσης των κόμβων του πλέγματος κοντά στον τοίχο.

Οι εξισώσεις της μέσης ροής U, V, P και Φ της στρωτής ροής μετατρέπονται για την τυρβώδη ροή, αντικαθιστώντας το μ με μ_{eff} , το Γ με Γ_{eff} και με την εισαγωγή κάποιων επιπρόσθετων όρων πηγής, με τη χρήση γραμμικοποίησης πηγής. Οι εξισώσεις k και ε δεν είναι διαφορετικές από τις άλλες εξισώσεις μεταφοράς βαθμωτού, θεωρώντας τα S_k και S_ε επιπρόσθετους όρους πηγής, που εισάγονται με τη μέθοδο γραμμικοποίησης πηγής.

$$\int_V S_k dV = b k_p + c = -\frac{C_\mu C_D \rho^2 k^* \delta V}{\mu_t} k_p + G \delta V$$

$$\int_V S_\varepsilon dV = b \varepsilon_p + c = \frac{C_2 \rho \varepsilon_p^* \delta V}{k_p} \varepsilon_p + \frac{G_1 \varepsilon_p^* G \delta V}{k_p^*}$$

$\delta V =$ όγκος κυψελίδας, $k_p, \varepsilon_p =$ προηγούμενες τιμές.

$$G \cong 2 \left[\left(\frac{U_e - U_w}{\delta X_{ew}} \right)^2 + \left(\frac{V_n - V_s}{\delta r_{ns}} \right) + \dots \right]$$

Ένα σημείο που πρέπει να προσεχθεί σχετικά με την μεταχείριση των πηγών S_k και S_ε είναι ότι το b δεν πρέπει να είναι αρνητικό. Πράγμα που μας παρέχει ευστάθεια λύσης και επιβεβαιώνει ότι οι τιμές του k που υπολογίζονται δεν καθίστανται ποτέ αρνητικές.

Γενικά κοντά στον τοίχο θεωρείται ότι επικρατούν συνθήκες μιας μονοδιάστατης ροής Couette. Το οριακό στρώμα θεωρείται σταθερής διατμητικής τάσης ($\tau \approx \tau_w$) και σταθερής ροής θερμότητας ($q = q_w$). Οι συνθήκες αυτές απαιτούν αδιαπέραστο τοίχο με κλίσεις πίεσης μηδενικές ή αμελητέες στην κατεύθυνση της ροής: $\frac{\tau_w}{dP/dx} \gg y$

Η εξίσωση της ορμής μετασχηματίζεται τότε σε μια ιδιαίτερα απλή αδιάστατη μορφή: $\tau = (\mu + \mu_t) \frac{dU}{dy}$ ή $\frac{\tau}{\tau_w} = (1 + \frac{\mu_t}{\mu}) \frac{dU^+}{dy^+}$

Στην περιοχή κοντά στον τοίχο ο τοπικός αριθμός Reynolds μεταβάλλεται σημαντικά και η υιοθετούμενη προσέγγιση είναι η εξάρτηση του τοπικού αριθμού Reynolds, y^+ , που βασίζεται στην απόσταση y από τον τοίχο και στην ταχύτητα τριβής U_τ : $y^+ = \frac{U_\tau y}{\nu}$,

$$U_\tau = \sqrt{\frac{\tau_w}{\rho}}$$

Η περιοχή κοντά στον τοίχο χωρίζεται σε τρεις υποπεριοχές (Hinge, 1959). Στο ιξώδες υπόστρωμα $0 < y^+ < 5$, όπου επικρατούν οι επιδράσεις του ιξώδους, στο αδρανές υπόστρωμα $30 < y^+ < 400$, όπου η ροή είναι πλήρως τυρβώδης αλλά $\tau \sim \tau_w$ και στο μεταβατικό στρώμα $5 < y^+ < 30$, όπου η ροή δεν είναι επηρεασμένη μόνο από το ιξώδες αλλά ούτε και πλήρως τυρβώδης. Ακολουθείται ο διαχωρισμός της ροής με καθορισμό του σημείου $y^+ = 11.63$ (όπου η γραμμική κατανομή της ταχύτητας του ιξώδους υποστρώματος συναντά την λογαριθμική κατανομή του αδρανούς υποστρώματος) κάτω από το οποίο η ροή υποτίθεται πλήρως ιξώδης και πάνω πλήρως τυρβώδης.

$$\text{Για } y^+ \leq 11.63, \frac{\mu_t}{\mu} \ll 1, \tau \sim \tau_w \Rightarrow U^+ = y^+$$

$$\text{Για } y^+ > 11.63, \frac{\mu_t}{\mu} \gg 1, \tau \sim \tau_w, \nu_t \sim \kappa y U_\tau \Rightarrow$$

$$\Rightarrow U^+ = \frac{1}{\kappa} \ln y^+ + \text{const} = \frac{1}{\kappa} \ln(Ey^+)$$

$U^+ = U/U_\tau$, $\kappa = 0.4187$ σταθερά von Karman και E είναι μια σταθερά ολοκλήρωσης που εξαρτάται από το μέγεθος της μεταβολής της διατμητικής τάσης εγκαρσίως του οριακού στρώματος και της τραχύτητας του τοίχου. Η τιμή $E = 9.8$ είναι για λείο τοίχο και σταθερή

διατμητική τάση. Επιδράσεις μεταφοράς μάζας εγκάρσια του οριακού στρώματος και διαφορετικές κλίσεις πίεσης, ενσωματώνονται με τροποποίηση του E.

Επίσης υπάρχει μεγάλο μηχανολογικό ενδιαφέρον για πρόβλεψη χαρακτηριστικών μεταφοράς στους τοίχους. Η ίδια μεταχείριση όπως και στην μεταφορά ορμής, εφαρμόζεται και για την μεταφορά θερμότητας. Η αντίστοιχη αδιάστατη εξίσωση είναι:

Μεταφορά βαθμωτού (π.χ $\Phi=T$):

$$q'' = (\Gamma + \Gamma_t) c_p \frac{dT}{dy} \frac{q''}{q''_w} = \left(\frac{\Gamma}{\mu} + \frac{\Gamma_t}{\mu} \right) \frac{d\Gamma^+}{dy^+}$$

Υποτίθεται σταθερή ροή θερμότητας εγκάρσια του οριακού στρώματος.

Για $y^+ \leq 11.63$, $\Gamma \gg \Gamma_t$, $q'' \sim q''_w \Rightarrow T^+ = \sigma_{\Phi} y^+$

$$\begin{aligned} \text{Για } y^+ > 11.63, \Gamma \ll \Gamma_t, \quad q'' \sim q''_w, \quad \frac{\Gamma_t}{\rho} = \frac{\nu_t}{\sigma_{\Phi,t}} \sim \frac{\kappa y U_\tau}{\sigma_{\Phi,t}} \Rightarrow T^+ = \frac{\sigma_{\Phi,t}}{\kappa} \ln y^+ + C_T \{ \sigma_{\Phi} \} \\ = \sigma_{\Phi,t} \left[U^+ + P \left\{ \frac{\sigma_{\Phi}}{\sigma_{\Phi,t}} \right\} \right] \end{aligned}$$

Όπου: $T^+ = \frac{\rho U_\tau c_p (T_w - T)}{q''_w}$, $\sigma_{\Phi} = \frac{c_p \mu}{\kappa}$, $\sigma_{\Phi,t}$ τυρβώδης αριθμός

Prandtl και: $P \left\{ \frac{\sigma}{\sigma_{\Phi,t}} \right\} = 9.24 \left[\left(\frac{\sigma_{\Phi}}{\sigma_{\Phi,t}} \right)^{3/4} + 1 \right]$ (Jayatillaka, 1966).

Όπως και προηγουμένως ο αριθμός Reynolds είναι 11.63. Για $y^+ < 11.63$ η μεταφορά υποτίθεται ότι λαμβάνει χώρα με μοριακή δραστηριότητα. Για $y^+ > 11.63$ υποτίθεται ότι η μεταφορά οφείλεται καθ' ολοκληρία στην τύρβη. Η παράμετρος T^+ , ροής θερμότητας, είναι μία λογαριθμική συνάρτηση του y^+ και επίσης ενός όρου, οποίος με την σταθερά ολοκλήρωσης C_T συνδυάζεται με την P- συνάρτηση (ισχύει για αδιαπέραστους λείους τοίχους).

Η μεταχείριση στον τοίχο των k και ϵ εξισώσεων βασίζεται πάλι στην θεώρηση μονοδιάστατης, σταθερής διατμητικής τάσης Couette ροής οριακού στρώματος. Η υιοθετούμενη προσέγγιση ισχύει μόνο στο αδρανές υπόστρωμα όπου η ροή υποτίθεται πλήρως τυρβώδης, $y^+ > 30$, αλλά επαρκώς κοντά στον τοίχο, ώστε να ισχύει η παραδοχή της σταθερής διατμητικής τάσης ($y^+ < 400$). Σε αυτήν την περιοχή, ο τοπικός ρυθμός παραγωγής της τύρβης εξισορροπείται από τον ρυθμό της

σκέδασης της ε : $-u\nu \frac{du}{dy} = \varepsilon$ παράγοντας $k = \left(\frac{\tau_1}{\rho}\right) C_\mu^{1/2} \Rightarrow \tau_1 = \rho C_\mu^{1/2} k$

διατμητική τάση στο αδρανές υπόστρωμα και: $\varepsilon^{++} = \frac{C_\mu^{3/4} k^{3/2}}{ky}$

Η εξίσωση της τυρβώδους ενέργειας μετασχηματίζεται σε μία απλή σχέση που περιγράφει την διατμητική τάση $\tau_1 (-\tau_w)$ και τον ρυθμό σκέδασης ε , μέσα στο αδρανές υπόστρωμα.

Η εξίσωση ε μετασχηματίζεται σ' έναν τύπο που αποτυπώνει τροποποίηση του σ_ε σ' αυτήν την περιοχή:

$$C_1 = C_2 \frac{\kappa^2}{\sigma_\varepsilon C_\mu^{1/2}} \text{ και: } \sigma_\varepsilon = \frac{\kappa^2}{(C_2 - C_1) C_\mu^{1/2}}$$

Μια από τις πιο σημαντικές συνέπειες της θεώρησης ισορροπίας είναι η τελική έκφραση για την διατμητική τάση τοίχου τ_w σε όρους του k και των σταθερών της τύρβης.

$$\tau_w = \frac{\rho C_\mu^{1/4} k^{1/2} \kappa U}{\ln(Ey^+)}$$

$$\tau_w = \frac{U}{U^+} \rho C_\mu^{1/4} k^{1/2}, U^+ \cong \frac{U \sqrt{\rho \tau_1}}{\tau_w}, y^+ = \frac{y \sqrt{\tau_w / \rho}}{\nu} \cong \frac{y \rho C_\mu^{1/4} k^{1/2}}{\mu}$$

Επίσης η σχέση για το ε με ολοκλήρωση στον όγκο ελέγχου (ή κυψελίδα), την παρακείμενη στον τοίχο (με επέκταση της ισορροπίας στην k εξίσωση στο ιξώδες υπόστρωμα και στο ενδιάμεσο στρώμα):

$$\int_V \varepsilon dV \cong \frac{C_\mu^{3/4} k^{3/2} U^+ dV}{y} \text{ με } U^+ = \begin{cases} y^{y^+} \text{ για } y^+ \leq 11.63 \\ \frac{1}{\kappa} \ln(Ey^+) \text{ για } y^+ > 11.63 \end{cases}$$

Για την ενσωμάτωση τώρα των οριακών συνθηκών τοίχου υποτίθεται μία εφαπτομενική ταχύτητα U_p , στο συνηθισμένο ισοζύγιο ορμής, για έναν κόμβο κοντά στον τοίχο:

Γι' αυτήν την γεωμετρία τίθεται $\alpha_s=0$. Η ενσωμάτωση της σωστής έκφρασης της διατμητικής δύναμης εισάγεται δια της μεθόδου της πηγής: Για τον κόμβο P εντός της τυρβώδους περιοχής ($y^+ > 11.63$):

$$F_s = \tau_s \delta X_{ew} = \frac{\rho C_\mu^{1/4} k_{pw}^{1/2} (U_p - U_s) \kappa \delta X_{ew}}{\ln(Ey^+)}$$

όπου:

$$k_{pw} = \frac{k_p + k_w}{2}, \quad y^+ = \frac{\rho C_\mu^{1/4} k_{pw}^{1/2} y_p}{\mu}$$

Για τον κόμβο P εντός του ιξώδους υποστρώματος ($y^+ < 11.63$):

$$F_s = \tau_s \delta X_{ew} = \frac{\mu (U_p - U_s) \delta X_{ew}}{y_p}$$

Για τις ταχύτητες τις κάθετες στον τοίχο δεν χρειάζεται ειδική μεταχείριση.

Η ενσωμάτωση των οριακών συνθηκών τοίχου για τις βαθμωτές μεταβλητές ακολουθεί την ίδια διαδικασία, όπως και στην περίπτωση της ορμής. Μηδενίζεται η έκφραση α_s και η ροή βαθμωτού Q_s από το ισοζύγιο θερμότητας:

Για το P μέσα στην τυρβώδη περιοχή ($y^+ > 11.63$):

$$Q_s = q'' \delta X_{ew} = \frac{\rho C_\mu^{1/4} k_p^{1/2} (T_p - T_s) \delta X_{ew}}{T^*}$$

όπου:

$$T^* = \sigma_{\Phi,t} \left[U^+ + P \frac{\sigma_\Phi}{\sigma_{\Phi,t}} \right]$$

Για το P μέσω στο ιξώδες υπόστρωμα ($y^+ \leq 11.63$):

$$Q_s = q'' \delta X_{ew} = \frac{\mu}{\sigma_\phi} \frac{(T_p - T_s) \delta X_e}{y_p}$$

Η ενσωμάτωση του Q_s επιτυγχάνεται πάλι με την μέθοδο της γραμμικοποίησης της πηγής.

Η ενσωμάτωση της τυρβώδους κινητικής ενέργειας k απαιτεί ειδική διαδικασία. Χρησιμοποιώντας το ισοζύγιο για το k τίθεται $\alpha_s = 0$ στον τοίχο. Ο όρος παραγωγής G στην k -εξίσωση μετασχηματίζεται σε μια απλούστερη μορφή, σε συνάρτηση με την διατμητική τάση $\tau_s (\sim \tau_\omega)$:

$$\int_V \mu_t \left(\frac{\partial U}{\partial r} + \frac{\partial V}{\partial X} \right)^2 dV \cong \frac{\tau_s (U_p - U_s) \delta V}{y_p}$$

Όπου τ_s , U_s θεωρούνται μέσες τιμές στην κύψελίδα και:

$$\int_V C_{Drel} dV \cong \frac{C_D \rho C_\mu^{3/4} (k_p^* K_s^{3/2}) U^+ \delta V}{y_p}$$

όπου: $U^+ = \frac{1}{\kappa} \ln(Ey^+)$ για $y^+ > 11.63$

και: $U^+ = y^+$ για $y^+ \leq 11.63$

Ολόκληρη η πηγή $S_k = G - C_D \rho \epsilon$ για το ισοζύγιο του k , ενσωματώνεται στον κώδικα δια της μεθόδου της πηγής με την βοήθεια των συντελεστών b και c .

Η ροή στον τοίχο σε αντίθεση με το k (που είναι μηδέν), για το ϵ φθάνει στην μέγιστη τιμή (πολύ μεγαλύτερη της ελεύθερης ροής). Αυτή η συμπεριφορά έχει αποτέλεσμα να είναι δύσκολο, στο ισοζύγιο του ϵ , στην κυψελίδα κοντά στον τοίχο να χειριστούμε το α_s . Εδώ υιοθετείται μια καθορισμένη τιμή για το ϵ_p (ανεξάρτητη του y^+), βασισμένοι φφσε σχέσεις ισορροπίας. Μέσα στο αδρανές υπόστρωμα (όπου ο αριθμός Re είναι μεγάλος):

$$\epsilon_p = \frac{C_\mu K_p^{3/2}}{L}, \quad L = C_\mu^{1/4} \kappa y \quad \text{στην περιοχή του τοίχου}$$

$$\text{συνεπώς: } \epsilon_p = \frac{C_\mu^{3/4} K_R^{3/2}}{\kappa y_p}$$

όπου: L είναι κλίμαξ μήκους σκέδασης της τύρβης. Η τιμή ϵ_p ενσωματώνεται με τη μέθοδο εισαγωγής των σταθερών b και c (π.χ. $b=-10^{30}$, $C=\epsilon_p 10^{30}$).

1.18. ΑΣΤΑΘΕΙΑ -ΑΚΡΙΒΕΙΑ-ΟΙΚΟΝΟΜΙΑ

Σε πολλές σύνθετες ροές ενδέχεται να παρουσιασθούν αριθμητικές αστάθειες και απαιτούνται τότε προσθετικές τεχνικές για να επιτευχθεί σύγκλιση. Στις απλές ροές υπάρχουν τρεις βασικές αιτίες που προκαλούν αστάθεια. Λάθος καθορισμός του αρχικού πεδίου ενδέχεται να έχει αποτέλεσμα την αστάθεια. Μπορεί να απαλειφθεί με βελτίωση του αρχικού πεδίου ή με χρήση συντελεστών υποχαλάρωσης. Μια δεύτερη αιτία στην παραγωγή εστιών αστάθειας είναι η εκλογή ακατάλληλων συντελεστών υποχαλάρωσης. Μια τρίτη αιτία είναι η ελλιπής επίλυση των εξισώσεων πεπερασμένων διαφορών κατά την διάρκεια της επανάληψης. Η εξίσωση διορθωτικής πίεσης P' είναι η περισσότερο ευαίσθητη σε αυτήν την περίπτωση, γιατί σε κάθε επανάληψη το αρχικό πεδίο της P' είναι μηδέν. Αύξηση του αριθμού εφαρμογής της LBL μεθόδου απαλοίφει αυτήν την αστάθεια.

Η ακρίβεια εξαρτάται πρώτον από τον βαθμό που η λύση ικανοποιεί τις εξισώσεις πεπερασμένων διαφορών. Ο βαθμός αυτός αντικατοπτρίζεται από την τάση των υπολειπόμενων πηγών. Δεύτερον από τον βαθμό που οι εξισώσεις πεπερασμένων διαφορών ικανοποιούν τις μερικές διαφορετικές εξισώσεις. Γενικά χρησιμοποιούνται μικρότερα μεγέθη πλεγμάτων, προς επίτευξη λύσης ανεξάρτητης του πλέγματος. Τρίτον και οι εφαρμοζόμενες συνθήκες στα όρια και οι θέσεις των ορίων ενδέχεται να επηρεάζουν την ακρίβεια της λύσης. Βελτίωση μπορεί να επιτευχθεί με ρύθμιση των συνθηκών και των θέσεων εφαρμογής. Και τέταρτον, μια πλήρως συγκλιμένη ανεξάρτητη πλέγματος λύση, βασιζόμενη σε ικανοποιητικές οριακές συνθήκες και θέσεις εφαρμογής, εξαρτάται από την επάρκεια του τυρβώδους μοντέλου, στο πόσο καλά οι προβλέψεις αντανακλούν την πραγματικότητα σε σύγκριση με τις πειραματικές μετρήσεις.

Πράγματι σε πολύπλοκες ροές η ανεπάρκεια του τυρβώδους μοντέλου ενδέχεται να είναι αιτία διάφορων ασταθειών. Είναι σημαντικό να διακρίνουμε μεταξύ υπολογιστικών λαθών και αστάθειας (που μπορούν να εξαλειφθούν), από εκείνα που οφείλονται στην φυσική μοντελοποίηση.

Οι απαιτήσεις οικονομίας, υπολογιστικού χρόνου και αποθήκευσης, δύνανται να ελαχιστοποιηθούν με ορισμένες τεχνικές. Πρώτον με ακριβή προσδιορισμό των αρχικών πεδίων, π.χ. ξεκινώντας από σωστό προηγούμενο υπολογισμό, μειώνεται ο υπολογιστικός χρόνος σημαντικά.

Δεύτερον με βέλτιστη διευθέτηση του πλέγματος, συγκέντρωση κόμβων πλέγματος σε περιοχές με απότομες κλίσεις και μείωσης σε περιοχές όπου οι κλίσεις είναι σχεδόν ομοιόμορφες. Μείωση του μεγέθους της υπολογιστικής περιοχής είναι επίσης χρήσιμη για την οικονομία του πλέγματος. Τρίτον με την εύρεση μέσω πειράματος και δοκιμής των συντελεστών υποχαλάρωσης βελτιώνεται ο παράγοντας σύγκλισης. Και τέταρτον με βάση πιο ρεαλιστικό κριτήριο σύγκλισης για σύνθετες ροές, περίπου 1% των υπολειπόμενων πηγών (σε απλές ροές το κριτήριο διατηρείται στο 0.1%).

2. PROJECT

ΟΙ ΕΝΤΟΛΕΣ ΓΙΑ ΤΗΝ ΕΚΤΕΛΕΣΗ ΤΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ

Αρχικά πληκτρολογούμε **Dir** εντολή η οποία χρησιμεύει για να προβληθεί ο κατάλογος των αρχείων.

Όταν τρέχουμε εξ' αρχής το πρόγραμμα θέτουμε **IREAD/0/** και τοποθετούμε **C** (από το **comments** που σημαίνει σχόλια) στο αρχείο **FOR015.DAT**. Στο συγκεκριμένο αρχείο αποθηκεύονται οι στιγμιαίες τιμές και στο αρχείο **FOR032.DAT** οι "μέσες τιμές".

FOR016.DAT: Είναι το αρχείο που περιέχει τα στιγμιαία στοιχεία όλων των μεταβλητών, οι οποίες χρειάζονται για να συνεχίσει ο κώδικας σε κάποιο χρονικό σημείο.

FOR015.DAT: Παίρνει τα στοιχεία από το **FOR016.DAT** και έτσι ο κώδικας συνεχίζει από μία ενδιάμεση λύση. Σε κάθε βήμα σβήνουμε το **FOR015** και παίρνουμε καινούργιες λύσεις από το **FOR016**.

Το ίδιο συμβαίνει και με την εντολή **FOR031.DAT** (γράφει όλα τα στατιστικά στοιχεία) και **FOR032.DAT** (διαβάζει για **IREAD = 1** όλα τα στατιστικά στοιχεία).

Τα αρχεία **FOR014.DAT**, **FOR016.DAT**, **FOR017.DAT**, **FOR018.DAT**, **FOR019.DAT**, **FOR041.DAT** κάνουν στατιστική. Για να τρέξει ο κώδικας δεν πρέπει να έχουμε αποτελέσματα γιατί «χτυπούν» το ένα στο άλλο.

Για αυτόν τον λόγο οι εντολές που δίνονται είναι οι εξής:

```
DEL *.OBJ          <ENTER>
DEL *.RES          <ENTER>
DEL *.EXP          <ENTER>
DEL FOR016.DAT    <ENTER>
DEL FOR031.DAT    <ENTER>
DEL FOR019.DAT    <ENTER>
DEL FOR041.DAT    <ENTER>
DEL FOR014.DAT    <ENTER>
DEL FOR017.DAT    <ENTER>
```


DEL POP.RES <ENTER>

POPCH4: Κύριος κώδικας για την επίλυση των υδροδυναμικών μεταβλητών.

POPDOK: Εντολή μετατροπής γραφικών. Λαμβάνει U, V ταχύτητες του αρχείου POPCH4.FOR και δημιουργεί τα αρχεία PR2.DAT, 3DGRID.DAT, FTN04, FTN08

FOR013.DAT: Είναι το αρχείο που αποθηκεύονται όλα τα θερμοδυναμικά στοιχεία από το POPCH4.

F77L3 POPCH4.FOR: Περιγράφει όλη τη γεωμετρία, ταχύτητα, ρύπανση, πίεση και θερμοκρασία. <ENTER>. Το πρόγραμμα τρέχει.

OS386: Εντολή για μετατροπή από 16 bit. Σε 32 bit.

UP L32 POPCH4.OBJ: Εντολή για να μετατραπεί το OBJ που δημιουργήσαμε τρέχοντας από το FOR σε περιβάλλον μηχανής.

UP POPCH4.EXP: Μας δίνει αποτελέσματα.

Ο κώδικας λύνει όλες τις εξισώσεις σε όλους τους κόμβους της γεωμετρίας μας με 20 εσωτερικά βήματα. Ανά 20 βήματα μας δίνει ενδεικτική λύση.

ΒΗΜΑ	ΧΡΟΝΟΣ	ΤΑΧΥΤΗΤΕΣ ΣΕ ΚΑΘΕ ΣΗΜΕΙΟ ΑΝΑ ΧΡΟΝΙΚΟ ΒΗΜΑ		
20	0.100000 E-02	18.2866	18.2699	17.9968
40	• •	•	•	•
	• •	•	•	•
	• •	•	•	•

Η διαδικασία αυτή επαναλαμβάνεται 15.000 φορές.

Ο κώδικας λύνει τις εξισώσεις:

➤ Συνέχειας

$$\frac{\theta}{\theta_x} (rpU) + \frac{\theta}{\theta_v} (rpV) = 0$$

➤ Ορμής σε τρεις διευθύνσεις του χώρου για στρωτή ροή.

$$\frac{1}{r} \left[\frac{\theta}{\theta_x} (rpUU) + \frac{\theta}{\theta_r} (rpVU) \right] = -\frac{\theta\rho}{\theta_x} + \frac{1}{r} \left[r\mu_{eff} \frac{\theta u}{\theta_x} \right] + \frac{\theta}{\theta_v} \left(r\mu_{eff} \frac{\theta u}{\theta r} \right) + S_x$$

$$\frac{1}{r} \left[\frac{\theta}{\theta_x} (rpUV) + \frac{\theta}{\theta_v} (rpVV) \right] = -\frac{\theta\rho}{\theta r} + \frac{1}{r} \left[\frac{\theta}{\theta_x} \left(r\mu_{eff} \frac{\theta V}{\theta_x} \right) + \frac{\theta}{\theta_v} \left(r\mu_{eff} \frac{\theta U}{\theta r} \right) \right] - \mu_{eff} \frac{U}{r^2} + S_u$$

➤ Μεταφορά βαθμωτού

$$\frac{1}{v} \left[\frac{\theta}{\theta_x} (rpU\phi) + \frac{\theta}{\theta_v} (rpV\phi) \right] = \frac{1}{v} \left[\frac{\theta}{\theta_x} \left(r\Gamma_{eff} \frac{\theta\phi}{\theta_x} \right) + \frac{\theta}{\theta_v} \left(r\Gamma_{eff} \frac{\theta\phi}{\theta_v} \right) \right] + S_\phi$$

OS386: Εντολή για μετατροπή από 32bit σε 16bit.

FOR016.DAT: Αρχείο με τις στιγμιαίες τιμές των μεταβλητών.

FOR031.DAT: Αρχείο με τις μέσες τιμές των μεταβλητών.

FOR014.DAT: Αρχείο με τις μέσες κ, V ταχύτητες στην χ και y διευθύνσεις.

FOR041.DAT: Αρχείο με τις στιγμιαίες κ, V ταχύτητες στην χ και y διευθύνσεις.

FOR017.DAT: Μεταβλητές καύσης κλάσμα μίγματος, θερμοκρασία σε σημεία
FOR018.DAT: του χώρου, υδρογονάνθρακες CH₄ (μεθάνιο), μονοξείδιο του
FOR019.DAT: άνθρακα CO.

1^ο βήμα: POP.RES → Αποτελέσματα

2^ο βήμα: Τρέχω το POPDOK.

Με το POPDOK.FOR διαβάζω το αρχείο FOR014.DAT.

Τέσσερα καινούργια αρχεία δημιουργούμε στο C:\FORTRANSOURCE.

Τα αρχεία αυτά είναι τα εξής: \PROPAK2.DAT

\3DGRID.DAT

\IFTN04

\IFTN08

Οι εντολές που δίνουμε είναι οι εξής:

- F77L3 POPDOK.FOR
- OS386
- UP L32 POPDOK.OBJ
- UP POPDOK.EXP
- OS386 REMOVE

Το STREAK31.FOR είναι πρόγραμμα γραφικών το οποίο διαβάζει τα παραπάνω 4 αρχεία. Το περιβάλλον είναι S.01 FORTRAN.

Το DEL RESULTS.DAT σβήνεται και “τρέχουμε” το STREAK31.

Πληκτρολογώ: 1 <ENTER>

Πληκτρολογώ: 2 <ENTER>

Πληκτρολογώ: Y <ENTER>

Πληκτρολογώ: 1 <ENTER>

Πληκτρολογώ: 1 <ENTER>

Πληκτρολογώ: 1 <ENTER>

MODE C080: Εντολή για την αποδέσμευση της οθόνης των γραφικών.

Είσοδος στο NED RESULTS.DAT

Σβήνω το DEL RESULTS.SCR

NED CONVERT.FOR

Για να βελτιωθεί η ποιότητα σχεδίασης των ροϊκών γραμμών δημιουργήθηκε το πρόγραμμα CONVERT.FOR το οποίο τρέχει σε συνεργασία με τον κώδικα STREAK.FOR και μετατρέπει τα δεδομένα σχεδίασης σε μορφή τέτοια ώστε να διαβάζονται από το AUTOCAD.

Δημιουργήθηκε το RESULTS.SCR

Το AUTOCAD “τρέχει” με την εντολή ACAD.

Πληκτρολογώ 1 <ENTER>

Πληκτρολογώ 41 <ENTER>

Πληκτρολογώ Y <ENTER>

Εντολή SCRIPT <ENTER>

Αρχείο 41:\C:\FORTRAN\SOURCE\RESULTS <ENTER>

Παίρνει τα αποτελέσματα από το RESULTS.SCR.

1. Από το περιβάλλον Windows μεταφερόμαστε στο περιβάλλον DOS. C:\TEST> Editor χρησιμοποιείται ο NED.COM.
2. Το POPCH1.FOR έχει την γεωμετρία:

Το FORØ13.DAT είναι το αρχείο όπου αποθηκεύονται τα δεδομένα του θερμοδυναμικού μοντέλου. 41 X 41 διπλές σειρές FORMATED δεδομένων βήμα ποσοστού αναλογίας αέρα 0 – 1 (βήμα = 2.5000E-02) ζαθ CO2 (0 – 1) (b;hma = 2,5000E-02). Αντίστοιχα δεδομένα ρ – T και κατ’ όγκον στιγμιαίες ποσότητες αερίων καύσης CO, CO₂, N, H₂, CH₄, O₂ κ.λ.π.

Όταν ο κώδικας αρχίζει για πρώτη φορά ανοικτά αρχεία FORØ16.DAT FORØ13.DAT και των δεδομένων που λαμβάνουμε FORØ31.DAT, FORØ17.DAT, FORØ18.DAT, FORØ19.DAT, FORØ6.DAT, FORØ14.DAT, FORØ41.DAT.

FORØ32.DAT (διαβάζει για IREAD = 1 όλα τα στατιστικά στοιχεία)

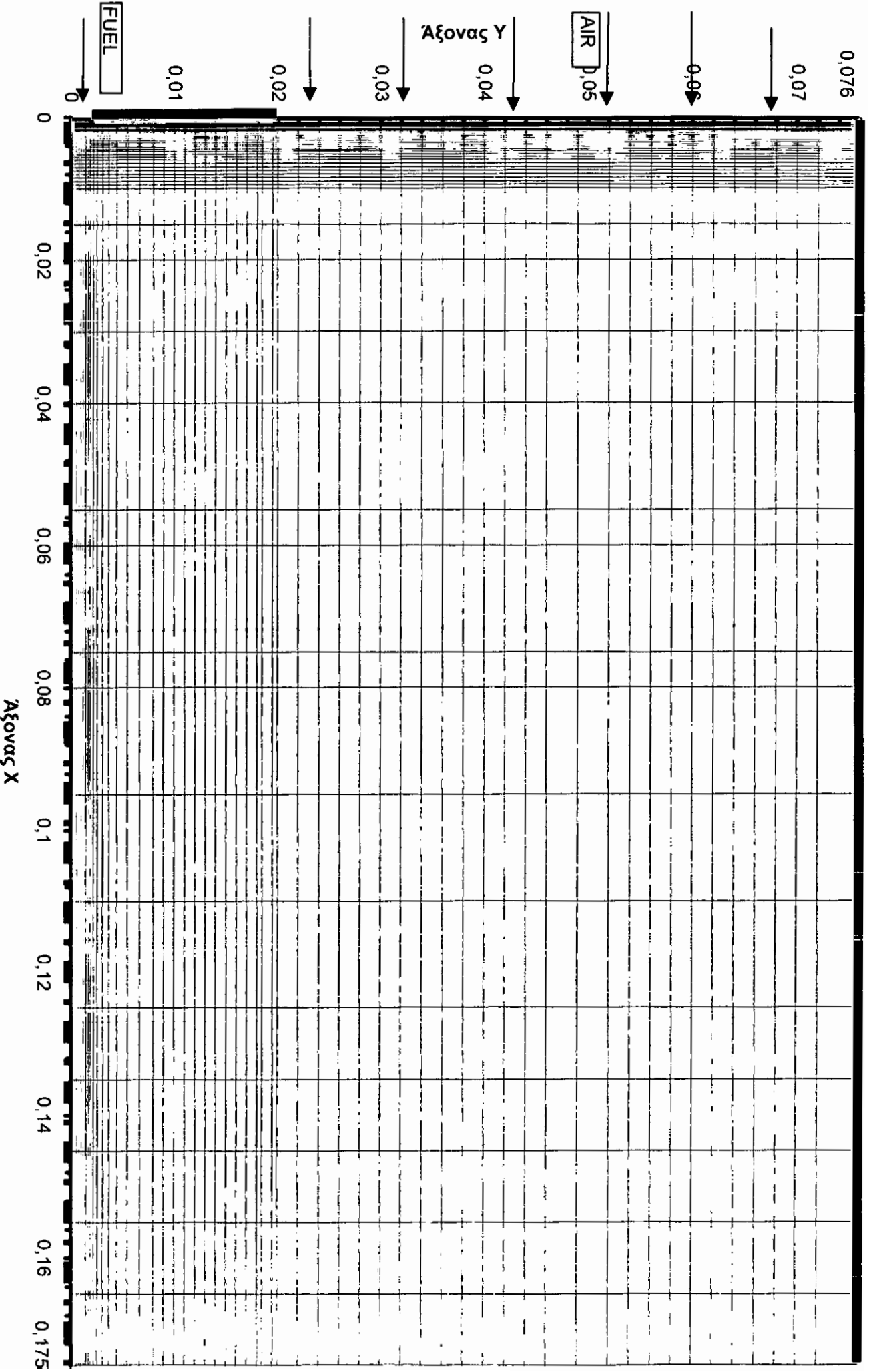
FORØ31.DAT (Γράφει όλα τα στατιστικά στοιχεία).

FORØ41.DAT (Οι στιγμιαίες ταχύτητες U, V).

FORØ42-43 51.DAT

Φάσεις U, V, TEMP σε διαφορετικές χρονικές στιγμές.

FORØ15.DAT Όλες οι μεταβλητές των εξισώσεων για να συνεχίσει το
FORØ16.DAT πρόγραμμα από την χρονική στιγμή της διακοπής του.



ΠΡΟΛΟΓΟΚΛΗΡΩΜΕΝΟΣ ΚΩΔΙΚΑΣ ΠΡΟΓΡΑΜΜΑΤΟΣ

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C*****
C   A COMPUTER PROGRAMME FOR SOLVING THE CONSERVATION EQUATIONS
C   OF TWO DIMENSIONAL FLUID FLOW
C   VERSION- REACTING TURBULENT FLOW ; GASEOUS FUEL
C
C   -----
C   AIR-->
C   /
C   /
C   /
C   FUEL-->
C   .....
C
C*****
PARAMETER (NX=59, NY=59, NS=59, NXYZ=3481)
DIMENSION F(17*NXYZ), GAM(NXYZ), P(NXYZ), RHO(NXYZ)
DIMENSION U(NXYZ), V(NXYZ), W(NXYZ), DP(NXYZ), Q(NXYZ),
1D(NXYZ), TEMP(NXYZ), PSI(NXYZ), VISMIXT(NXYZ), PRAD(NXYZ)
COMMON/CBCOEF/AN(NXYZ), AS(NXYZ), AR(NXYZ), AL(NXYZ),
1SP(NXYZ), SU(NXYZ), QU(NXYZ), QV(NXYZ)
COMMON/CBOLT/FOLD(8*NXYZ), RHOFOLD(NXYZ)
COMMON/GENRAL/R(NY), X(NX), Y(NY), RELAX(20), RESID(20),
1TITLE(6,20), PR(20), PRT(20)
COMMON/CBLK1/ICYCL(20), IPRINT(20), KO(NX), NFO(20),
1INVORDR(20)
COMMON/CBLK2/ISTEP, KRAD, KTIM, IMAX, KMAX, L, LP1, N, NP1,
1ISTR, KSTR, ISKIP, KSKIP, NSKIP, IDMX, KDMX, IKREF, IBURN,
1LITEST, ISTOP, LSTEP, NCYCL, NF, NV, NVU, NVV, NVW, NVDP, NVK, NVD, NVF, NVFF,
1NVNO, NVT, NVP, NVRHO, NVCO, NVCO2, NVHC, NVH2, NVH2O, NVO2, NVN2, NMAX

COMMON/CBLK3/DMAX, DSUM, DTIM, FLOIN, FLOUT1, FLOUT2, PRESS, TIM, TLAST,
1FIA, F2A, ATOT1, ATOT2, FLOC, FLOINFU
COMMON/CGRID/DY(NY), DX(NX), RDIFY(NY), RDIFYV(NY),
1DIFX(NX), DIFXU(NX), RM(NY), YV(NY), XU(NX)
COMMON/CINLET/UINL(NY), QINL(NY), DINL(NY)
COMMON/CSTORE/TS(NS), YS(NS,4), GS(NS)
COMMON/CTURB/AK, CD1, CD2, CM, CD, EWALL, RED
COMMON/CPROP/CP, GASCON, RHOREF, VISCO, WAIR
COMMON/CBFUEL/AA, BB, RHOAIR, TEMPAD, OXYG1
COMMON/CBEQUI/YTEQ(41,41,6), FDCO2(41,41), RHOG(41,41),
1FS(41), ZS(41), NFS, NZS
COMMON/CGEOM/FXBC(2,10), UC, UIN(NY), CMU25
1, RINA, ROUTA, RINF, ROUTF
COMMON/CBPECL/PUV, PKE, ISWIUV, ISWIKE
COMMON/OBSTACL/IARX, ITEL, KARX, KTEL, IFARX, IFTL, IIN1, IIS1,
1KKW1, KKE1, IIN2, IIS2, UFU, RHOFU, RKE(NXYZ), DIK(NXYZ), RLU(NXYZ),
1RLV(NXYZ), RLUV(NXYZ), FIKL(NY), FIKR(NY), FIKN(NX), FIKS(NX)
COMMON/UVRMS/URMS(NXYZ), VRMS(NXYZ), UMESO(NXYZ), VMESO(NXYZ),
1QMESO(NXYZ), DMESO(NXYZ), ARXEI1(NXYZ), ARXEI2(NXYZ), ARXEI3(NXYZ),
1ARXEI4(NXYZ), PMESO(NXYZ), ARXEI5(NXYZ), ARXEI6(NXYZ), ARXEI7(NXYZ)
1, ARXEI8(NXYZ), ARXEI9(NXYZ), ARXEI10(NXYZ), QTOTAL(NXYZ)
1, PRMS1(NXYZ), UR1(NXYZ), UR2(NXYZ), VR1(NXYZ), VR2(NXYZ), COMESO
(NXYZ)
1, ARXEI11(NXYZ), TMESO(NXYZ), ARXEI12(NXYZ), FMESO(NXYZ)
COMMON/FTY/TY(NY)
COMMON/FDUT/FDOT(NXYZ)
COMMON/FIII/FII(NXYZ), FLLL(NXYZ)
EQUIVALENCE (F(1), U(1)), (F(NXYZ+1), V(1)), (F(2*NXYZ+1), DP(1)),
1(F(3*NXYZ+1), W(1)), (F(4*NXYZ+1), Q(1)), (F(5*NXYZ+1), D(1)),
1(F(9*NXYZ+1), TEMP(1))

C
DATA EMAX/1.E-7/
DATA ISTEP/0/

```



```

DATA KISTEP/1/
DATA IREAD/0/
DATA IWRITE/1/
C   OPEN(15,STATUS='OLD',FORM='UNFORMATTED',FILE='FOR015.DAT')
OPEN(16,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR016.DAT')
OPEN(13,STATUS='OLD',FORM='FORMATTED',FILE='FOR013.DAT')
C   OPEN(11,STATUS='OLD',FORM='FORMATTED',FILE='FOR011.DAT')
C   OPEN(32,STATUS='OLD',FORM='UNFORMATTED',FILE='FOR032.DAT')
OPEN(31,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR031.DAT')
OPEN(17,STATUS='NEW',FORM='FORMATTED',FILE='FOR017.DAT')
OPEN(18,STATUS='NEW',FORM='FORMATTED',FILE='FOR018.DAT')
OPEN(19,STATUS='NEW',FORM='FORMATTED',FILE='FOR019.DAT')
C   OPEN(48,STATUS='NEW',FORM='FORMATTED',FILE='FOR048.DAT')
C   OPEN(49,STATUS='NEW',FORM='FORMATTED',FILE='FOR049.DAT')
C   OPEN(50,STATUS='NEW',FORM='FORMATTED',FILE='FOR050.DAT')
OPEN(6,STATUS='NEW',FILE='POP.RES')
OPEN(14,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR014.DAT')
C/////
OPEN(41,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR041.DAT')
C   OPEN(42,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR042.DAT')
C   OPEN(43,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR043.DAT')
C   OPEN(44,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR044.DAT')
C   OPEN(45,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR045.DAT')
C   OPEN(46,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR046.DAT')
C   OPEN(47,STATUS='NEW',FORM='UNFORMATTED',FILE='FOR047.DAT')
C
10 FORMAT(16I5)
20 FORMAT(9F8.5)
30 FORMAT(20A4)
35 FORMAT(6E12.4)
37 FORMAT(4E12.6)
40 FORMAT(8F9.3)
52 FORMAT(10I5)
53 FORMAT(22I3)
54 FORMAT(8F5.1)
61 FORMAT(F9.6,1X,E12.6,1X,E12.6,1X,E12.6)
C ** READ INPUT DATA**
CALL COEFF0(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
C*****GEOMETRY DATA*****
WRITE(6,10) IREAD,IWRITE
WRITE(6,10) NMAX,L,N,IKREF
Y(1)=0.0
Y(2)=0.0001
Y(3)=0.0002
Y(4)=0.0004
Y(5)=0.0006
Y(6)=0.0008
Y(7)=0.001
Y(8)=0.0012
Y(9)=0.0014
Y(10)=0.0015
C-----
Y(11)=0.0017
Y(12)=0.0019
Y(13)=0.0022
Y(14)=0.0026
Y(15)=0.0031
Y(16)=0.0037
Y(17)=0.0045
Y(18)=0.0055
Y(19)=0.0067
Y(20)=0.0080
Y(21)=0.009
Y(22)=0.01
Y(23)=0.011
Y(24)=0.012

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Y(25)=0.013
Y(26)=0.014
Y(27)=0.015
Y(28)=0.016
Y(29)=0.017
Y(30)=0.018
Y(31)=0.0185

C-----

Y(32)=0.0195
Y(33)=0.020
Y(34)=0.022
Y(35)=0.024
Y(36)=0.026
Y(37)=0.028
Y(38)=0.030
Y(39)=0.032
Y(40)=0.034
Y(41)=0.036
Y(42)=0.038
Y(43)=0.040
Y(44)=0.042
Y(45)=0.044
Y(46)=0.046
Y(47)=0.049
Y(48)=0.052
Y(49)=0.054
Y(50)=0.056
Y(51)=0.058
Y(52)=0.060
Y(53)=0.062
Y(54)=0.064
Y(55)=0.066
Y(56)=0.068
Y(57)=0.070
Y(58)=0.072
Y(LP1)=0.076

C-----

WRITE(6,20) (Y(I),I=1,LP1)

C-----

RINF=0.0
ROUTF=0.00159
RINA=0.01905
ROUTA=0.076

C-----

X(1)=0.0
X(2)=0.0001
X(3)=0.0002
X(4)=0.0003
X(5)=0.0004
X(6)=0.0005
X(7)=0.0006
X(8)=0.0007
X(9)=0.0008
X(10)=0.0009
X(11)=0.001
X(12)=0.0011
X(13)=0.0012
X(14)=0.0013
X(15)=0.0014
X(16)=0.0015
X(17)=0.0016
X(18)=0.0017
X(19)=0.0018
X(20)=0.0019
X(21)=0.002
X(22)=0.0022

```

X(23)=0.0024
X(24)=0.0026
X(25)=0.0028
X(26)=0.003
X(27)=0.0033
X(28)=0.0036
X(29)=0.0039
X(30)=0.0042
X(31)=0.0045
X(32)=0.0048
X(33)=0.0052
X(34)=0.0056
X(35)=0.006
X(36)=0.0065
X(37)=0.007
X(38)=0.0075
X(39)=0.008
X(40)=0.0085
X(41)=0.009
X(42)=0.0095
X(43)=0.01
X(44)=0.015
X(45)=0.02
X(46)=0.03
X(47)=0.04
X(48)=0.055
X(49)=0.06
X(50)=0.075
X(51)=0.08
X(52)=0.095
X(53)=0.11
X(54)=0.125
X(55)=0.135
X(56)=0.145
X(57)=0.155
X(58)=0.165
X(NP1)=0.175
WRITE(6,20) (X(K),K=1, NP1)
IF(KRAD.EQ.1) R(1)=1.0
WRITE(6,20) R(1),RINF,ROUTE,RINA,ROUTA,Y(LP1),X(NP1)
IARX=32
ITEL=58
KARX=0
KTEL=0
IFARX=2
IFTEL=10
III1=0
III2=0
III3=1
III4=0
KKK1=0
KKK2=0
IIN1=1
IIS1=10
KKW1=32
KKE1=59
IIN2=LP1-III3
IIS2=1+III4
WRITE(6,10) IIN2,IIS2,IIN1,IIS1,KKW1,KKE1
C*****CYLINDRICAL*****
UINL2=18.
UMEAN=18.
RED=UMEAN*0.2032*RHOREF/VISCO
UFU=62.5
RHOFU=0.65155
C*****

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```

TEIN2=2./3.*(1./100.*UINL2)**2
EDIN2=TEIN2**1.5/(.25*2*(ROUTA-RINA))
FTEIN2=2./3.*(1./100.*UFU)**2
FEDIN2=FTEIN2**1.5/(.25*2*(ROUTF-RINF))
FXBC(1,NVU)=UINL2
FXBC(1,NVV)=0.0
FXBC(1,NVW)=0.0
FXBC(1,NVDP)=0.0
FXBC(1,NVK)=TEIN2
FXBC(1,NVD)=0.
FXBC(1,NVF)=0.0
FXBC(1,NVFF)=0.0
FXBC(1,NVNO)=0.0
FXBC(2,NVU)=UFU
FXBC(2,NVV)=0.0
FXBC(2,NVW)=0.0
FXBC(2,NVDP)=0.0
FXBC(2,NVK)=FTEIN2
FXBC(2,NVD)=0.0
FXBC(2,NVF)=1.0
FXBC(2,NVFF)=0.0
FXBC(2,NVNO)=0.0
C READ COMPOSITION DATA
C SET FIELD VARIABLES
C
REWIND 13
DO 1110 J=1,NZS
DO 1110 I=1,NFS
READ(13,1014) FS(I), ZS(J), RHOG(I,J), FDCO2(I,J), (YTEQ(I,J,K), K=
1,6)
1110 CONTINUE
1014 FORMAT(3X,1P6E12.4,/,27X,1P4E12.4)
DO 1015 KF=1,NFS
DO 1015 LZ=1,NZS
IF(FS(KF).NE.0.0) GO TO 1015
RHOAIR=RHOG(KF,LZ)
TEMPAD=YTEQ(KF,LZ,1)
OXYG1=YTEQ(KF,LZ,3)
1015 CONTINUE
C
44 CALL COEFF1(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
C
C SET FIELD VARIABLES
C
C READ(32) KISTEP,ARXEI1,ARXEI2,ARXEI3,ARXEI4,ARXEI5,ARXEI6
C 1,ARXEI7,ARXEI8,ARXEI9,ARXEI10,ARXEI11,ARXEI12,FII
C
KISTEP=1
C
DO 151 I=1,LP1
DO 151 K=1,NP1
IK=I+KO(K)
RLUV(IK)=1.5
PRAD(IK)=0.7
IF(I.GE.L.OR.I.LE.2.OR.K.LE.2.OR.K.GE.N) RLUV(IK)=.09
IF(IREAD.EQ.1) GO TO 151
FII(IK)=2.
151 CONTINUE
C-----
IF(IREAD.EQ.0) GO TO 45
READ(15) F,P,RHO,FOLD,RHOFOLD,RLUV
C-----

GO TO 55
45 CONTINUE
DO 50 I=1,LP1

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```

DO 50 K=1,NP1
IK=I+KO(K)
RHO(IK)=RHOREF
P(IK)=0.0
TEMP(IK)=0.
DO 50 NV=1,NF
IKP=IK+NFO(NV)
F(IKP)=FXBC(1,NV)
50 CONTINUE
55 CONTINUE
CALL PROBSP(F,GAM,RHO,U,V,W,Q,D,DP)
IF(IREAD.NE.1) GO TO 1333
GO TO 1135
1333 CONTINUE
DO 1134 NC=1,NF
NV=NVORDR(NC)
DO 1134 I=1,LP1
DO 1134 K=1,NP1
IK=I+KO(K)
RHOFOLD(IK)=RHO(IK)
IK=I+KO(K)+NFO(NV)
FOLD(IK)=F(IK)
1134 CONTINUE
C
1135 VOL=0.5*(R(1)+R(LP1))*(Y(LP1)-Y(1))*(X(NP1)-X(1))
C
C START OF MAIN LOOP
C
100 CONTINUE
PUV=1.E6
CALL THERMP(RHO,F,TEMP,VISMIXT,PRAD)
DO 155 I=1,LP1
DO 155 K=1,NP1
IK=I+KO(K)
IF(K.EQ.1.AND.I.GE.IFARX.AND.I.LE.IFTEL) RHO(IK)=0.65155
155 CONTINUE
101 CONTINUE
ILSTEP=ILSTEP+1
IF(ISTEP.GE.14999) CALL OUTPUT(F,U,V,GAM,RHO,P,PSI)
IF(ISTOP.EQ.1) GO TO 204
IF(ISTOP.EQ.1.AND.KTIM.EQ.1) GO TO 200
CALL COEFF2(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
ISTEP=ISTEP+1
IF(ISTOP.EQ.0) GO TO 110
DSUM=DSUM/FLOIN
DMAX=DMAX*VOL/FLOIN
RESID(NVDP)=RESID(NVDP)*VOL/FLOIN
110 CONTINUE
IF(KTIM.EQ.2) GO TO 150
IF(ISTEP.LT.LSTEP.AND.DSUM.GT.EMAX) GO TO 100
ISTOP=ISTOP+1
IF(IBURN.EQ.0) ISTOP=ISTOP+1
DO 1515 NV=1,NF
1515 ICYCL(NV)=0
C ICYCL(NVNO)=0
RELAX(NVRHO)=0.0
IF(ISTOP.EQ.0) GO TO 100
ISTEP=ISTEP-1
C NV=NVNO
C CALL TEST(2,F,GAM)
GO TO 100
150 IF(ISTOP.EQ.0) GO TO 7630
QINF=RHOREF*UINL2**2/2.
C-----
C PRINT *,ISTEP,TIM,F(45+KO(22)+NFO(1)),F(45+KO(32)+NFO(1)),
C 1DSUM

```

```

C-----
      IF(DSUM.GT.EMAX.AND.ILSTEP.LT.20) GO TO 101
7630  ILSTEP=0
      IF(ISTEP.LT.LSTEP.AND.TIM.LT.TLAST) GO TO 215
      IF(IBURN.LE.0) THEN
        ISTOP=1
      ELSE
        ISTOP=ISTOP+1
        DO 115 NV=1,NF
115   ICYCL(NV)=0
        ISTEP=ISTEP-1
        RELAX(NVRHO)=.0
        ENDIF
215   IF(ISTOP.GE.0) GO TO 1333
        TIM=TIM+DTIM
C-----
      IF(ISTEP.GE.1) THEN
        KISTEP=KISTEP+1
        WRITE(6,10) KISTEP
      END IF
      IF(ISTEP.EQ.14980) WRITE(41) U,V
C     IF(ISTEP.EQ.6300) WRITE(42) TEMP,TEMP
C     IF(ISTEP.EQ.6800) WRITE(43) TEMP,TEMP
C     IF(ISTEP.EQ.7300) WRITE(44) TEMP,TEMP
C     IF(ISTEP.EQ.16000) WRITE(45) U,V
C     IF(KISTEP.EQ.170) WRITE(46) U,V
C     IF(KISTEP.EQ.180) WRITE(47) U,V
C     IF(KISTEP.EQ.265) WRITE(48) U,V
C     IF(KISTEP.EQ.800) WRITE(49) U,V
C     IF(KISTEP.EQ.900) WRITE(50) U,V
C     IF(KISTEP.EQ.1000) WRITE(51) U,V
C=====DRAG=====
C     CFF1=0.
C     CFF2=0.
C     CPP1=0.
C     CPP2=0.
C     DO 9 K=KARX,KTEL
C       IKH=ITEL+1+KO(K)+NFO(NVU)
C       CFF1=CFF1+2.*F(IKH)/DY(ITEL+1)*VISCO/(0.5*RHOREF*UINL2*
C 1UINL2)*DX(K)
C       IKH=IARX-1+KO(K)+NFO(NVU)
C       CFF2=CFF2+2.*F(IKH)/DY(IARX)*VISCO/(0.5*RHOREF*UINL2*UINL2)*
C 1DX(K)
C     9 CONTINUE
C     DO 94 I=IARX,ITEL
C       IKH=I+KO(KARX-1)
C       CPP1=CPP1+P(IKH)/(0.5*RHOREF*UINL2*UINL2)*RDIFY(I)
C       IKH=I+KO(KTEL+1)
C       CPP2=CPP2+P(IKH)/(0.5*RHOREF*UINL2*UINL2)*RDIFY(I)
C     94 CONTINUE
C     CFF1=CFF1/.008
C     CFF2=CFF2/.008
C     CPP1=CPP1/.008
C     CPP2=CPP2/.008
C     CFF=CFF1+CFF2
C     CPP=CPP1-CPP2
C     COLIKO=CFF+CPP
C     PRINT *,COLIKO
C     WRITE(6,37) COLIKO
C
DO 8 I=1,LP1
DO 8 K=1,NP1
IF(I.GE.L.OR.I.LE.2.OR.K.LE.2.OR.K.GE.N) GO TO 8
IK=I+KO(K)
IKN=IK+1
IKR=IK+KO(2)

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```

UMESO (IK) = ( (KISTEP-1) *ARXEI1 (IK) +U (IK) ) /KISTEP
ARXEI1 (IK) =UMESO (IK)
VMESO (IK) = ( (KISTEP-1) *ARXEI2 (IK) +V (IK) ) /KISTEP
ARXEI2 (IK) =VMESO (IK)
QMESO (IK) = ( (KISTEP-1) *ARXEI7 (IK) +F (IK+NFO (NVK) ) ) /KISTEP
ARXEI7 (IK) =QMESO (IK)
URMS (IK) = ( (KISTEP-1) *ARXEI8 (IK) + (F (IK+NFO (NVU) ) -UMESO (IK) )
1 * (F (IK+NFO (NVU) ) -UMESO (IK) ) ) /KISTEP
ARXEI8 (IK) =URMS (IK)
VRMS (IK) = ( (KISTEP-1) *ARXEI9 (IK) + (F (IK+NFO (NVV) ) -VMESO (IK) )
1 * (F (IK+NFO (NVV) ) -VMESO (IK) ) ) /KISTEP
ARXEI9 (IK) =VRMS (IK)
TMESO (IK) = ( (KISTEP-1) *ARXEI11 (IK) +TEMP (IK) ) /KISTEP
ARXEI11 (IK) =TMESO (IK)
FMESO (IK) = ( (KISTEP-1) *ARXEI12 (IK) +F (IK+NFO (NVF) ) ) /KISTEP
ARXEI12 (IK) =FMESO (IK)
COMESO (IK) = ( (KISTEP-1) *ARXEI12 (IK) +F (IK+NFO (NVCO) ) ) /KISTEP
ARXEI12 (IK) =COMESO (IK)
C
IF (I.GE.L.OR.I.LE.2.OR.K.LE.2.OR.K.GE.N) GO TO 8
C
C   IF (I.GE. (L-3) .OR. I.LE.5.OR.
C   1 (I.LE. (ITEL+5) .AND.K.LE. (KTEL+27) .AND.I.GE. (IARX-5) .
C   LAND.K.GE.KARX) ) GO TO 881
C   IF (I.LE.ITEL.AND.K.LE. (KTEL+3) .AND.I.GE.IARX.
C   LAND.K.GE. (KARX-3) ) GO TO 882
DUDX=(UMESO (IKR) -UMESO (IK) ) /DIFX (K)
DVDY=(VMESO (IKN) -VMESO (IK) ) /RDIFY (I)
DUDX=DUDX*0.33-0.667*DVDY
DUDX=ABS (DUDX)
DVDY=DVDY*0.33-0.667*DUDX
DVDY=ABS (DVDY)
DDD=SQRT (DIFX (K) *RDIFY (I) )
RMSUV=0.5 * (URMS (IK) +VRMS (IK) )
QMESO (IK) =ABS (QMESO (IK) )
QKSGS=SQRT (QMESO (IK) +1.E-10)
RLUV1=1./DDD*QKSGS/ (DUDX+1.E-10) * (URMS (IK) / (RMSUV+1.E-10) +
0.667)
RLUV2=1./DDD*QKSGS/ (DVDY+1.E-10) * (VRMS (IK) / (RMSUV+1.E-10) +
0.667)
IF (RLUV1.LT.1.5) RLUV1=1.5
IF (RLUV1.GT.1.5) RLUV1=1.5
IF (RLUV2.LT.1.5) RLUV2=1.5
IF (RLUV2.GT.1.5) RLUV2=1.5
RLUV (IK) =0.5 * (RLUV1+RLUV2)
C-----
C   GO TO 8
C 881 CONTINUE
C   DDD=SQRT (DIFX (K) *RDIFY (I) )
C   RMSUV=0.5 * (URMS (IK) +VRMS (IK) )
C   QMESO (IK) =ABS (QMESO (IK) )
C   QKSGS=SQRT (QMESO (IK) +1.E-10)
C   DVDY=(VMESO (IKN) -VMESO (IK) ) /RDIFY (I)
C   DVDY=ABS (DVDY)
C   RLUV2=1./DDD*QKSGS/ (RMSUV+1.E-10) *VRMS (IK) / (DVDY+1.E-10)
C   IF (RLUV2.LT.0.09) RLUV2=0.09
C   IF (RLUV2.GT.1) RLUV2=.1
C   RLUV (IK) =RLUV2
C   GO TO 8
C 882 CONTINUE
C   DDD=SQRT (DIFX (K) *RDIFY (I) )
C   RMSUV=0.5 * (URMS (IK) +VRMS (IK) )
C   QMESO (IK) =ABS (QMESO (IK) )
C   QKSGS=SQRT (QMESO (IK) +1.E-10)
C   DUDX=(UMESO (IKR) -UMESO (IK) ) /DIFX (K)
C   DUDX=ABS (DUDX)

```

```

C      RLUV1=1./DDD*QKSGS/(RMSUV+1.E-10)*URMS(IK)/(DUDX+1.E-10)
C      IF(RLUV1.LT.0.09) RLUV1=0.09
C      IF(RLUV1.GT..1) RLUV1=.1
C      RLUV(IK)=RLUV1
C      8 CONTINUE
C      WRITE(6,10) ISTEP
C      QINF=RHOREF*UINL2**2/2.
C
C-----
C      PRINT *, ISTEP, TIM, F(58+KO(34)+NFO(1)), F(58+KO(41)+NFO(1)),
C      1F(58+KO(46)+NFO(1)), DSUM
C-----
C      WRITE(6,37) TIM, DTIM, DSUM
C      WRITE(6,37) ISTEP, TIM, F(58+KO(34)+NFO(1)), F(58+KO(41)+NFO(1)),
C      1F(58+KO(46)+NFO(1)), DSUM
C-----
C      WRITE(17,61) TIM, F(12+KO(66)+NFO(1)), F(12+KO(66)+NFO(2))
C      WRITE(17,61) F(19+KO(32)+NFO(NVF)), TEMP(19+KO(32))
C      WRITE(18,61) F(19+KO(32)+NFO(NVF)), F(19+KO(32)+NFO(NVCO))
C      WRITE(17,61) F(24+KO(46)+NFO(NVF)), TEMP(24+KO(46))
C      WRITE(18,61) F(24+KO(46)+NFO(NVHC)), F(24+KO(46)+NFO(NVCO))
C      IF(ISTEP.EQ.300) THEN
C      DO 9814 I=1,LP1
C      DO 9814 K=1,NP1
C      IK=I+KO(K)
C      WRITE(17,61) X(K),Y(I),TMESO(IK)
C 9814 CONTINUE
C      ENDIF
C-----
C      204 IF(ISTOP.EQ.1) GO TO 200
C      GO TO 1333
C      200 CONTINUE
C      IF(IWRITE.EQ.0) GO TO 300
C      WRITE(31) KISTEP,ARXEI1,ARXEI2,ARXEI3,ARXEI4,ARXEI5,ARXEI6
C      1,ARXEI7,ARXEI8,ARXEI9,ARXEI10,ARXEI11,ARXEI12,FII
C      WRITE(14) UMESO,VMESO
C      WRITE(16) F,P,RHO,FOLD,RHOFOLD,RLUV
C-----
C      DO 321 I=1,LP1
C      DO 321 K=1,NP1
C      IK=I+KO(K)
C      IF(I.EQ.5.OR.I.EQ.10.OR.I.EQ.17.OR.I.EQ.20.OR.I.EQ.21) GO TO
C 322
C      IF(I.EQ.34.OR.I.EQ.35.OR.I.EQ.39.OR.I.EQ.43.
C 1OR.I.EQ.44.OR.I.EQ.57) GO TO 322
C      IF(I.EQ.58.OR.I.EQ.61.OR.I.EQ.68.OR.I.EQ.73) GO TO 322
C      GO TO 321
C 322 CONTINUE
C      IF(K.EQ.9.OR.K.EQ.12.OR.K.EQ.15.OR.K.EQ.16.OR.K.EQ.24) GO TO
C 323
C      IF(K.EQ.31.OR.K.EQ.32.OR.K.EQ.33.OR.K.EQ.34.OR.K.EQ.36) GOTO
C 323
C      IF(K.EQ.38.OR.K.EQ.42.OR.K.EQ.46.OR.K.EQ.51.OR.K.EQ.56) GO TO
C 323
C      GO TO 321
C 323 CONTINUE
CC
C      WRITE(48,61) X(K),Y(I),TEMP(IK)
C      WRITE(49,61) X(K),Y(I),F(IK+NFO(NVF))
CC      WRITE(50,61) X(K),Y(I),F(IK+NFO(NVCO))
C 321 CONTINUE
C-----
C      300 STOP
C      END
C
C      BLOCK DATA

```


C

```
PARAMETER (NX=59, NY=59, NS=59, NXYZ=3481)
COMMON/CBFUEL/AA, BB, RHOAIR, TEMPAD, OXYG1
COMMON/CBEQUI/YTEQ(41, 41, 6), FDCO2(41, 41), RHOG(41, 41),
1FS(41), ZS(41), NFS, NZS
COMMON/GENRAL/R(NY), X(NX), Y(NY), RELAX(20), RESID(20),
1TITLE(6, 20), PR(20), PRT(20)
COMMON/CBLK1/ICYCL(20), IPRINT(20), KO(NX), NFO(20),
1NVORDR(20)
COMMON/CBLK2/ISTEP, KRAD, KTIM, IMAX, KMAX, L, LP1, N, NP1,
1ISTR, KSTR, ISKIP, KSKIP, NSKIP, IDMX, KDMX, IKREF, IBURN,
1ITEST, ISTOP, LSTEP, NCYCL, NF, NV, NVU, NVV, NVW, NVDP, NVK, NVD, NVE, NVFF,
```

```
1NVNO, NVT, NVP, NVRHO, NVCO, NVCO2, NVHC, NVH2, NVH2O, NVO2, NVN2, NMAX
COMMON/CBLK3/DMAX, DSUM, DTIM, FLOIN, FLOUT1, FLOUT2, PRESS, TIM, TLAST,
1F1A, F2A, ATOT1, ATOT2, FLOC, FLOINFU
COMMON/CGRID/DY(NY), DX(NX), RDIFY(NY), RDIFYV(NY),
1DIFX(NX), DIFXU(NX), RM(NY), YV(NY), XU(NX)
COMMON/CTURB/AK, CD1, CD2, CM, CD, EWALL, RED
COMMON/CPROP/CP, GASCON, RHOREF, VISCO, WAIR
COMMON/CBPECL/PUV, PKE, ISWIUV, ISWIKE
```

C

```
DATA IMAX, KMAX, NMAX, L, N, IKREF/59, 59, 17, 58, 58, 85/
DATA FLOIN, FLOUT1, FLOUT2, DMAX, DSUM, IDMX, KDMX/5*0., 2*0/
DATA ISTOP, KRAD, LSTEP, ITEST/-1, 2, 15000, 1/
DATA NF, NVU, NVV, NVDP, NVW, NVK, NVD, NVE, NVFF, NVNO
1/8, 1, 2, 3, 4, 5, 6, 7, 8, 9/
DATA NVT, NVCO, NVCO2, NVHC, NVH2, NVH2O, NVO2, NVN2, NVP, NVRHO
1/10, 11, 12, 13, 14, 15, 16, 17, 18, 19/
DATA NVORDR/1, 2, 3, 4, 5, 6, 7, 8, 9, 11*0/
DATA RELAX/2*0.5, 0.8, 5*0.5, 1.0, 11*0.5/
DATA IPRINT/3*1, 2, 1, 1, 1, 2, 2, 4*1, 1, 2*1, 2, 3*2/
DATA ICYCL/2*1, 3, 0, 1, 1, 1, 0, 0, 11*0/
DATA ISKIP, KSKIP, NSKIP, IBURN/2*1, 500, 1/
DATA KTIM, DTIM, TLAST/2, 1.E-3, 9.E3/
DATA PR/6*1., 14*0.7/, RHOREF/1.1716/, VISCO/1.79E-5/
DATA AK, CD1, CD2, CM, CD, EWALL/0.433, 1.44, 1.92, .09, 2.0, 4.82/
DATA PRT/5*1.0, 1.3, 14*0.7/, PRESS/0.0/
DATA PUV, PKE/2., 2./
DATA ISWIUV, ISWIKE/1, 1/
DATA NFS/41/, NZS/41/
DATA AA/2.743315/, BB/0.3186404/
DATA TITLE/4HU VE, 4HLOCI, 4HTY , 3*4H
1 4HV VE, 4HLOCI, 4HTY , 3*4H
2 4HDP P, 4HRESS, 4HURE , 4H CORR, 4HECTI, 4HON
3 4HW VE, 4HLOCI, 4HTY , 3*4H
4 4HK TU, 4HRBUL, 4HENCE, 4H ENE, 4HRGY , 4H
5 4HD DI, 4HSSIP, 4HATIO, 4HN RA, 4HTE , 4H
5 4HMIXT, 4HURE , 4HFRAC, 4HTION, 4HN , 4H
5 4H CO, 4H2CO2, 4HFRAC, 4HTION, 4HN , 4H
5 4H NI, 4HTRIC, 4HOXID, 4HE , 4H , 4H
6 4H TE, 4HMPER, 4HATUR, 4HE , 4H , 4H
5 4H CA, 4HRBON, 4HMONO, 4HXIDE, 4H , 4H
5 4H CA, 4HRBON, 4H DIO, 4HXIDE, 4H , 4H
5 4HPROP, 4HANE , 4H , 4H , 4H , 4H
5 4HH2 , 4H , 4H , 4H , 4H , 4H
5 4HH2O , 4H , 4H , 4H , 4H , 4H
5 4HO2 , 4H , 4H , 4H , 4H , 4H
5 4HN2 , 4H , 4H , 4H , 4H , 4H
7 4HP PR, 4HESSU, 4HRE (, 4HRELA, 4HTIVE, 4H)
5 4HD DE, 4HNSIT, 4HY , 4H , 4H , 4H
5 4HN333, 4H , 4H , 4H , 4H , 4H /
```

END

C

```
SUBROUTINE PROBSP (F, GAM, RHO, U, V, W, Q, D, DP)
```

C

```
PARAMETER (NX=59, NY=59, NS=59, NXYZ=3481)
DIMENSION F (17*NXYZ), GAM(NXYZ), P(NXYZ), RHO(NXYZ)
DIMENSION U(NXYZ), V(NXYZ), W(NXYZ), DP(NXYZ), Q(NXYZ),
1D(NXYZ)
COMMON/CBOLT/FOLD(8*NXYZ), RHOFOLD(NXYZ)
COMMON/CBCOEF/AN(NXYZ), AS(NXYZ), AR(NXYZ), AL(NXYZ),
1SP(NXYZ), SU(NXYZ), QU(NXYZ), QV(NXYZ)
COMMON/GENRAL/R(NY), X(NX), Y(NY), RELAX(20), RESID(20),
1TITLE(6, 20), PR(20), PRT(20)
COMMON/CINLET/UINL(NY), QINL(NY), DINL(NY)
COMMON/CBLK1/ICYCL(20), IPRINT(20), KO(NX), NFO(20),
1NVORDR(20)
COMMON/CBLK2/ISTEP, KRAD, KTIM, IMAX, KMAX, L, LP1, N, NP1,
1ISTR, KSTR, ISKIP, KSKIP, NSKIP, IDMX, KDMX, IKREF, IBURN,
```

```
1ITEST, ISTOP, LSTEP, NCYCL, NF, NV, NVU, NVV, NVW, NVDP, NVK, NVD, NVE, NVFF,
1NVNO, NVT, NVP, NVRHO, NVCO, NVCO2, NVHC, NVH2, NVH2O, NVO2, NVN2, NMAX
```

```
COMMON/CBLK3/DMAX, DSUM, DTIM, FLOIN, FLOUT1, FLOUT2, PRESS, TIM, TLAST,
1F1A, F2A, ATOT1, ATOT2, FLOC, FLOINFU
COMMON/CGRID/DY(NY), DX(NX), RDIFY(NY), RDIFYV(NY),
1DIFX(NX), DIFXU(NX), RM(NY), YV(NY), XU(NX)
COMMON/CTURB/AK, CD1, CD2, CM, CD, EWALL, RED
COMMON/CPROP/CP, GASCON, RHOREF, VISCO, WAIR
COMMON/CGEOM/FXBC(2, 10), UC, UIN(NY), CMU25
1, RINA, ROUTA, RINF, ROUTF
COMMON/OBSTACL/IARX, ITEL, KARX, KTEL, IFARX, IFTEL, IIN1, IIS1,
1KKW1, KKE1, IIN2, IIS2, UFU, RHOFU, RKE(NXYZ), DIK(NXYZ), RLU(NXYZ),
1RLV(NXYZ), RLUV(NXYZ), FIKL(NY), FIKR(NY), FIKN(NX), FIKS(NX)
COMMON/FTY/TY(NY)
DATA ZERO/1.E-10/
DATA CRIT/91.97/
```

C

```
CMU25=CM**0.25
CLW=AK/CM**0.75
TDRK=SQRT(CM)
RETURN
```

C

C-----

```
ENTRY PROBS1(F, GAM, RHO, U, V, W, Q, D, DP)
```

C-----

C

C

```
** CORRECT OVERALL MASS FLOW**
IF(NV.NE.NVDP) GO TO 100
FLOIN=0.0
FLOINFU=0.0
FLOUT1=0.0
DO 50 I=IARX, ITEL
IK=I+KO(2)
IKL=IK-KO(2)
DA=RDIFY(I)
50 FLOIN=FLOIN+RHO(IKL)*U(IK)*DA
DO 61 I=IFARX, IFTEL
IK=I+KO(2)
IKL=IK-KO(2)
DA=RDIFY(I)
FLOINFU=FLOINFU+RHOFU*UFU*DA
61 CONTINUE
FLOIN=FLOIN+FLOINFU
62 CONTINUE
DO 0051 I=2, L
IK=I+KO(NP1)
DA=RDIFY(I)
```

```

        IF(U(IK).LT.0.0) GO TO 0053
        FLOUT1=FLOUT1+RHO(IK)*U(IK)*DA
        GO TO 0051
0053 FLOIN=FLOIN-RHO(IK)*U(IK)*DA
0051 CONTINUE
        RATIO=FLOUT1/FLOIN
        DO 0085 I=2,L
        IK=I+KO(NP1)
        IF(U(IK).LT.0.0) GO TO 0085
        IF(RATIO.LT.0.1.OR.RATIO.GT.10.) RATIO=1.
        U(IK)=U(IK)/RATIO
0085 CONTINUE
        RETURN
C  ** SPECIFY BOUNDARY VALUES OF DEPENDANT VARIABLES AND GAMA*S
C
C  ** V VELOCITY **
C
100 IF(NV.NE.NVV) GO TO 200
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
        DO 110 K=1,NP1
        IK=2+KO(K)
        V(IK)=0.0
        IKS=IK-1
        GAM(IKS)=GAM(IK)
110 CONTINUE
C  ** X=X(1) AND X=X(NP1) PLANES
        DO 140 I=2,LP1
        IK=I+KO(2)
        IKL=IK-KO(2)
        V(IKL)=0.0
        IF(Y(I).LE.RINF.OR.Y(I).GE.ROUTF) GOTO 120
        V(IKL)=FXBC(2,NVV)
        GOTO 130
120 IF(Y(I).LE.RINA.OR.Y(I).GE.ROUTA) GOTO 130
        V(IKL)=FXBC(1,NVV)
130 IKR=I+KO(2)+KO(N)
        V(IKR)=0.0
140 CONTINUE
        RETURN
C
C  ** W VELOCITY **
C
200 IF(NV.NE.NVW) GO TO 300
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
C
C  ** U VELOCITY **
C
300 IF(NV.NE.NVU) GO TO 400
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
        DO 315 K=2,N
        IK=2+KO(K)
        IKS=IK-1
        GAM(IKS)=GAM(IK)
        U(IKS)=U(IK)
        IKN=IKS+L
        U(IKN)=0.
315 CONTINUE
C  ** X=X(1) AND X=X(NP1) PLANES
        DO 342 I=1,LP1
        IK=I+KO(2)
        U(IK)=0.0
        IF(Y(I).LE.RINF.OR.Y(I).GE.ROUTF) GOTO 340
        U(IK)=FXBC(2,NVU)
        GOTO 342
340 IF(Y(I).LE.RINA.OR.Y(I).GE.ROUTA) GOTO 342
        U(IK)=FXBC(1,NVU)

```

```

342 CONTINUE
RETURN
C ** TURBULENCE ENERGY, DISSIPATION RATE AND SCALAR VARIANCE **
C
400 IF(NV.NE.NVK.AND.NV.NE.NVD.AND.NV.NE.NVFF) GO TO 500
C ** Y=Y(1) AND Y=Y(LP1) PLANES **
DO 410 K=1,NP1
IK=2+KO(K)
IKS=IK-1
F(IKS+NFO(NV))=F(IK+NFO(NV))
GAM(IKS)=GAM(IK)
IKN=IKS+L
GAM(IKN)=0.0
IKN=IKN+NFO(NV)
F(IKN)=0.0
IF(NV.EQ.NVD) F(IKN)=F(IKN-1)
410 CONTINUE
C ** X=X(1) AND X=X(NP1) PLANES
DO 440 I=1,LP1
IKL=I+NFO(NV)
F(IKL)=0.0
IF(Y(I).LE.RINF.OR.Y(I).GE.ROUTF) GOTO 425
F(IKL)=FXBC(2,NV)
GOTO 439
425 IF(Y(I).LE.RINA.OR.Y(I).GE.ROUTA) GOTO 441
F(IKL)=FXBC(1,NV)
GO TO 439
441 IF(NV.EQ.NVD) F(IKL)=F(IKL+KO(2))
439 IKR=I+KO(NP1)
GAM(IKR)=0.0
440 CONTINUE
RETURN
C
C ** CONSERVED SCALAR AND NO MASS FRACTION
C
500 IF(NV.NE.NVF.AND.NV.NE.NVNO) GO TO 600
C ** Y=Y(1) AND Y=Y(LP1) PLANES
DO 510 K=1,NP1
IK=2+KO(K)
IKS=IK-1
GAM(IKS)=GAM(IK)
F(IKS+NFO(NV))=F(IK+NFO(NV))
IKN=IKS+L
GAM(IKN)=0.0
510 CONTINUE
C ** X=X(1) AND X=X(NP1) PLANES
DO 540 I=1,LP1
IKL=I+NFO(NV)
IF(Y(I).LE.RINF.OR.Y(I).GE.ROUTF) GO TO 525
F(IKL)=FXBC(2,NV)
GO TO 535
525 IF(Y(I).LE.RINA.OR.Y(I).GE.ROUTA) GO TO 535
F(IKL)=FXBC(1,NV)
535 IKL=I+KO(1)
GAM(IKL)=0.0
IKR=I+KO(NP1)
GAM(IKR)=0.0
540 CONTINUE
RETURN
C
600 RETURN
C-----
ENTRY PROBS2(F,GAM,RHO,U,V,W,Q,D,DP)
C-----
C
C ** MONTIFICATION OF COEFFICIENTS FOR SPECIFICATION OF INTERNAL

```

```

VALUES
C  ** OF DEPENDANT VARIABLES
C
C  ** DISSIPATION RATE **
C
      IF(NV.NE.NVD) GO TO 1100
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
C
      RETURN
C
C  ** TURBULENCE ENERGY **
C
      1100 IF(NV.NE.NVK) GO TO 1800
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
C
      RETURN
C-----
      1800 IF(NV.NE.NVDP) RETURN
           DMAX=0.0
           DSUM=0.0
           DO 1810 I=2,L
           DO 1810 K=2,N
           IK=I+KO(K)
           ASU=ABS(SU(IK))
           DSUM=DSUM+ASU*RDIFY(I)*DIFX(K)
           IF(ASU.LT.ABS(DMAX)) GO TO 1810
           DMAX=SU(IK)
           IDMX=I
           KDMX=K
      1810 CONTINUE
           RETURN
C
C-----
--
      ENTRY PROBS3(F,GAM,RHO,U,V,W,Q,D,DP)
C-----
--
C
C  ** CALCULATE BOUNDARY VALUES OF DEPENDANT VARIABLES FOR CASE OF
ZERO
C  ** GRADIENT BOUNDARY CONTITION
C
      IF(NV.NE.NVDP) GO TO 3000
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **
           DO 2010 K=1,NP1
           IK=2+KO(K)
           IKS=IK-1
           DP(IKS)=DP(IK)
           IK=L+KO(K)
           IKN=IK+1
           DP(IKN)=DP(IK)
      2010 CONTINUE
C  ** X=X(1) AND X=X(NP1) PLANES **
           DO 2030 I=1,LP1
           IK=I+KO(2)
           IKL=IK-KO(2)
           DP(IKL)=DP(IK)
           IK=I+KO(N)
           IKR=IK+KO(2)
           DP(IKR)=DP(IK)
      2030 CONTINUE
           RETURN
C
      3000 IF(NV.EQ.NVU.OR.NV.EQ.NVV.OR.NV.EQ.NVW) GO TO 3020
C  ** Y=Y(1) AND Y=Y(LP1) PLANES **

```

```

DO 3010 K=1,NP1
I=2+NFO(NV)
IK=I+KO(K)
IKS=IK-1
F(IKS)=F(IK)
IF(NV.EQ.NVK.OR.NV.EQ.NVFF) GO TO 3010
IKN=IKS+L
IK=IKN-1
F(IKN)=F(IK)
3010 CONTINUE
C ** X=X(1) AND X=X(NP1) PLANES **
3020 IF(NV.EQ.NVU) GO TO 3040
DO 3030 I=1,LP1
IK=I+KO(NP1)+NFO(NV)
IKL=IK-KO(2)
F(IK)=F(IKL)
4130 IF(NV.EQ.NVV.OR.NV.EQ.NVW.OR.NV.EQ.NVD.OR.
1NV.EQ.NVFF) GO TO 3030
3029 IF((Y(I).GE.RINF.AND.Y(I).LE.ROUTF).OR.(Y(I).GE.RINA.AND.
1Y(I).LE.ROUTA)) GO TO 3030
IK=I+KO(2)+NFO(NV)
IKL=IK-KO(2)
F(IKL)=F(IK)
3030 CONTINUE
RETURN
3040 CONTINUE
DO 2220 I=2,L
IK=I+KO(N)
IKR=I+KO(NP1)
IKL=IK-KO(2)
RHOIK=(RHO(IK)+RHO(IKL))*0.5
U(IKR)=U(IK)*RHOIK/RHO(IKR)
2220 CONTINUE
RETURN
END
C
SUBROUTINE OUTPUT(F,U,V,GAM,RHO,P,PSI)
C
PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
DIMENSION F(17*NXYZ),GAM(NXYZ),P(NXYZ),RHO(NXYZ)
DIMENSION U(NXYZ),V(NXYZ),W(NXYZ),DP(NXYZ),Q(NXYZ),
1D(NXYZ),TEMP(NXYZ),PSI(NXYZ)
COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
1TITLE(6,20),PR(20),PRT(20)
COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)
COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVFF,
1NVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
COMMON/CGRID/DY(NY),DX(NX),RDIFY(NY),RDIFYV(NY),
1DIFX(NX),DIFXU(NX),RM(NY),YV(NY),XU(NX)
COMMON/CTURB/AK,CD1,CD2,CM,CD,EWALL,RED
COMMON/CPROP/CP,GASCON,RHOREF,VISCO,WAIR
COMMON/OBSTAC/ IARX,ITEL,KARX,KTEL,IFARX,IFTEL,IIN1,IIS1,
1KKW1,KKE1,IIN2,IIS2,UFU,RHOFU,RKE(NXYZ),DIK(NXYZ),RLU(NXYZ),
1RLV(NXYZ),RLUV(NXYZ),FIKL(NY),FIKR(NY),FIKN(NX),FIKS(NX)
COMMON/UVRMS/URMS(NXYZ),VRMS(NXYZ),UMESO(NXYZ),VMESO(NXYZ),
1QMESO(NXYZ),DMESO(NXYZ),ARXEI1(NXYZ),ARXEI2(NXYZ),ARXEI3(NXYZ),
1ARXEI4(NXYZ),PMESO(NXYZ),ARXEI5(NXYZ),ARXEI6(NXYZ),ARXEI7(NXYZ),
1ARXEI8(NXYZ),ARXEI9(NXYZ),ARXEI10(NXYZ),QTOTAL(NXYZ)
1,PRMS1(NXYZ),UR1(NXYZ),UR2(NXYZ),VR1(NXYZ),VR2(NXYZ),COMESO

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```

(NXYZ)
  1, ARXEI11 (NXYZ), TMESO (NXYZ), ARXEI12 (NXYZ), FMESO (NXYZ)
  COMMON/FTY/TY (NY)
  COMMON/FDUT/FDOT (NXYZ)
C
C   IF (ISTEP.LT.1400) GO TO 600
C   IF (ISTEP.GT.1400) GO TO 50
  IF (ISTEP.LT.1) GO TO 600
  IF (ISTEP.GT.0) GO TO 50
  WRITE (6, 1000) (Y(I), I=1, LP1)
  WRITE (6, 1010) (R(I), I=1, LP1)
  WRITE (6, 1030) (X(K), K=1, NP1)
50 CONTINUE
  IF (ISTOP.GE.0) GO TO 54
  IF (MOD (ISTEP, ISKIP) .NE.0) GO TO 70
54 GO TO (55, 60), KTIM
55 WRITE (6, 1040) ISTEP, DMAX, IDMX, KDMX
  GO TO 65
60 CONTINUE
  WRITE (6, 1050) TIM, DTIM, ISTEP, DMAX, IDMX, KDMX
65 CONTINUE
  WRITE (6, 1060) FLOIN, FLOUT1, DSUM
  IF (ITEST.GT.0) WRITE (6, 1020) (NV, RESID (NV), NV=1, NF)
70 CONTINUE
C-----
  IF (MOD (ISTEP, NSKIP) .NE.0.AND. ISTOP.NE.1) GO TO 600
  DO 400 NV=1, NMAX
  IF (IPRINT (NV) .EQ.2) GO TO 400
  WRITE (6, 2020) (TITLE (I, NV), I=1, 6)
  K1=1
  IF (NV.EQ.NVU) K1=2
  IEND=LP1
  IF (NV.EQ.NVV) IEND=L
100  KL=MIN0 (K1+9*KSKIP, NP1)
  IF (NV.EQ.NVU) GO TO 101
  WRITE (6, 2010) (X(K), K=K1, KL, KSKIP)
  GO TO 102
101 WRITE (6, 2010) (XU(K), K=K1, KL, KSKIP)
102 CONTINUE
  WRITE (6, 2030) (K, K=K1, KL, KSKIP)
  WRITE (6, 2040)
  DO 200 II=1, IEND, ISKIP
  I=LP1+1-II
  KSTART=I+KO (K1)+NFO (NV)
  KEND=I+KO (KL)+NFO (NV)
  KJUMP=KO (KSKIP+1)
  IF (NV.EQ.NVV) GO TO 199
  WRITE (6, 2050) I, Y (I), (F(K), K=KSTART, KEND, KJUMP)
  GO TO 200
199 WRITE (6, 2050) I, YV (I), (F(K), K=KSTART, KEND, KJUMP)
200 CONTINUE
  IF (KL.EQ.NP1) GO TO 400
  K1=KL+1
  GO TO 100
400 CONTINUE
  WRITE (6, 2020) (TITLE (I, NVP), I=1, 6)
  K1=1
410  KL=MIN0 (K1+9*KSKIP, NP1)
  WRITE (6, 2010) (X(K), K=K1, KL, KSKIP)
  WRITE (6, 2030) (K, K=K1, KL, KSKIP)
  WRITE (6, 2040)
  DO 420 II=1, IEND, ISKIP
  I=LP1+1-II
  KSTART=I+KO (K1)
  KEND=I+KO (KL)
  KJUMP=KO (KSKIP+1)

```

```

        WRITE(6,2050) I, Y(I), (UMESO(K), K=KSTART, KEND, KJUMP)
420 CONTINUE
    IF(KL.EQ.NP1) GO TO 430
        KL=KL+1
        GO TO 410
430 WRITE(6,2020) (TITLE(I, NVRHO), I=1, 6)
        KL=1
440 KL=MINO(KL+9*KSKIP, NP1)
        WRITE(6,2010) (X(K), K=K1, KL, KSKIP)
        WRITE(6,2030) (K, K=K1, KL, KSKIP)
        WRITE(6,2040)
        DO 450 II=1, IEND, ISKIP
            I=LP1+1-II
            KSTART=I+KO(K1)
            KEND=I+KO(KL)
            KJUMP=KO(KSKIP+1)
        WRITE(6,2050) I, Y(I), (GAM(K), K=KSTART, KEND, KJUMP)
450 CONTINUE
    IF(KL.EQ.NP1) GO TO 500
        KL=KL+1
        GO TO 440
500 WRITE(6,2020) (TITLE(I, NVRHO), I=1, 6)
        KL=1
460 KL=MINO(KL+9*KSKIP, NP1)
        WRITE(6,2010) (X(K), K=K1, KL, KSKIP)
        WRITE(6,2030) (K, K=K1, KL, KSKIP)
        WRITE(6,2040)
        DO 470 II=1, IEND, ISKIP
            I=LP1+1-II
            KSTART=I+KO(K1)
            KEND=I+KO(KL)
            KJUMP=KO(KSKIP+1)
        WRITE(6,2050) I, Y(I), (RHO(K), K=KSTART, KEND, KJUMP)
470 CONTINUE
    IF(KL.EQ.NP1) GO TO 550
        KL=KL+1
        GO TO 460
550 WRITE(6,2020) (TITLE(I, NVRHO), I=1, 6)
        KL=1
461 KL=MINO(KL+9*KSKIP, NP1)
        WRITE(6,2010) (X(K), K=K1, KL, KSKIP)
        WRITE(6,2030) (K, K=K1, KL, KSKIP)
        WRITE(6,2040)
        DO 471 II=1, IEND, ISKIP
            I=LP1+1-II
            KSTART=I+KO(K1)
            KEND=I+KO(KL)
            KJUMP=KO(KSKIP+1)
        WRITE(6,2050) I, Y(I), (FMESO(K), K=KSTART, KEND, KJUMP)
471 CONTINUE
    IF(KL.EQ.NP1) GO TO 551
    IF(KL.EQ.NP1) GO TO 600
        KL=KL+1
        GO TO 461
551 WRITE(6,2020) (TITLE(I, NVRHO), I=1, 6)
        KL=1
462 KL=MINO(KL+9*KSKIP, NP1)
        WRITE(6,2010) (X(K), K=K1, KL, KSKIP)
        WRITE(6,2030) (K, K=K1, KL, KSKIP)
        WRITE(6,2040)
        DO 472 II=1, IEND, ISKIP
            I=LP1+1-II
            KSTART=I+KO(K1)
            KEND=I+KO(KL)
            KJUMP=KO(KSKIP+1)
        WRITE(6,2050) I, Y(I), (TMESO(K), K=KSTART, KEND, KJUMP)

```



```

472 CONTINUE
    IF(KL.EQ.NP1) GO TO 552
    K1=KL+1
    GO TO 462
552 CONTINUE
600 CONTINUE
    RETURN
1000 FORMAT(20H1THE VALUES OF Y ARE/(1P8E13.5))
1010 FORMAT(20H0THE VALUES OF R ARE/(1P8E13.5))
1020 FORMAT(1P,4(1X,6HRESID(,I2,2H)=,E10.3))
1030 FORMAT(20H0THE VALUES OF X ARE/(1P8E13.5))
1040 FORMAT('0ISTEP=',I5,5X,'DMAX=',1PE12.3,5X,'I=',I5,5X,'K=',I5)
1050 FORMAT(//'TIM=',1PE10.2,5X,'DT=',E10.2,5X,'ISTEP=',I5,5X,
1    'DMAX=',1PE12.3,5X,'I=',I5,5X,'K=',I5)
1060 FORMAT(9H FLOW IN=,1PE12.3,5X,9HFLOW OUT=,1PE12.3,5X,6HDSUM= ,
1E12.3)
2010 FORMAT(1H0,12X,3HX= ,1P10E11.3)
2020 FORMAT(/23(2H*-),5X,6A4,5X,23(2H*-))
2030 FORMAT(1H0,12X,3HK= ,I7,9I11)
2040 FORMAT(3H I,7X,1HY)
2050 FORMAT(1X,I2,2X,1P11E11.3)
2060 FORMAT(/23(2H*-),5X,24H    STREAM FUNCTION    ,5X,23(2H*-))
END
C*****
    SUBROUTINE COEFF(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
    PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
    DIMENSION F(17*NXYZ),GAM(NXYZ),P(NXYZ),RHO(NXYZ)
    DIMENSION U(NXYZ),V(NXYZ),W(NXYZ),DP(NXYZ),Q(NXYZ),
1D(NXYZ),TEMP(NXYZ),PSI(NXYZ),VISMIXT(NXYZ),PRAD(NXYZ)
    COMMON/CBCOEF/AN(NXYZ),AS(NXYZ),AR(NXYZ),AL(NXYZ),
1SP(NXYZ),SU(NXYZ),QU(NXYZ),QV(NXYZ)
    COMMON/CBOLT/FOLD(8*NXYZ),RHOFOLD(NXYZ)
    COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
1TITLE(6,20),PR(20),PRT(20)
    COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)
    COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVFF,
1NVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
    COMMON/CGRID/DY(NY),DX(NX),RDIFY(NY),RDIFYV(NY),
1DIFX(NX),DIFXU(NX),RM(NY),YV(NY),XU(NX)
    COMMON/CSTORE/TS(NS),YS(NS,4),GS(NS)
    COMMON/CBPECL/PUV,PKE,ISWIUV,ISWIKE
    COMMON/OBSTACL/IARX,ITEL,KARX,KTEL,IFARX,IFTEL,IIN1,IIS1,
1KKW1,KKE1,IIN2,IIS2,UFU,RHOFU,RKE(NXYZ),DIK(NXYZ),RLU(NXYZ),
1RLV(NXYZ),RLUV(NXYZ),FIKL(NY),FIKR(NY),FIKN(NX),FIKS(NX)
    COMMON/CQUICK/C1(NS),C2(NS),C3(NS),C4(NS),C5(NS),C6(NS),
1E1(NS),E2(NS),E3(NS),E4(NS),E5(NS),E6(NS),
1D1(NS),D2(NS),D3(NS),D4(NS),D5(NS),D6(NS),
1G1(NS),G2(NS),G3(NS),G4(NS),G5(NS),G6(NS)
    DIMENSION A1(NS),A2(NS)
C
C
    ENTRY COEFF0(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
C
    TIM=0.0
    ISTEP=0
    LP1=L+1
    NP1=N+1
    LM1=L-1
    NM1=N-1

```

```

DO 10 K=1, KMAX
10 KO(K)=(K-1)*IMAX
DO 15 I=1, NMAX
15 NFO(I)=(I-1)*IMAX*KMAX
IEND=LP1+KO(NP1)
RETURN

```

C

```
ENTRY COEFF1(F, GAM, RHO, P, U, V, W, Q, D, DP, VISMIKT, PRAD)
```

C

```

IF(KRAD.EQ.2) GO TO 25
DO 20 I=1, LP1
RM(I)=1.0
20 R(I)=1.0
GO TO 28
25 DO 26 I=2, LP1
R(I)=Y(I)+R(1)
26 RM(I)=0.5*(R(I)+R(I-1))
RM(2)=R(1)
RM(LP1)=R(LP1)
28 DO 30 I=2, LP1
30 DY(I)=Y(I)-Y(I-1)
DO 40 K=2, NP1
40 DX(K)=X(K)-X(K-1)
DO 45 I=3, LM1
RDIFY(I)=.5*(Y(I+1)-Y(I-1))
45 RDIFYV(I)=RM(I)*DY(I)
RDIFY(2)=DY(2)+.5*DY(3)
RDIFY(L)=DY(LP1)+.5*DY(L)
DO 46 I=2, L
46 RDIFY(I)=0.5*(RM(I+1)+RM(I))*RDIFY(I)
RDIFYV(3)=.5*(R(3)+R(1))*(Y(3)-Y(1))
RDIFYV(L)=.5*(R(LM1)+R(LP1))*(Y(LP1)-Y(LM1))
DO 55 K=3, NM1
DIFX(K)=.5*(X(K+1)-X(K-1))
55 DIFXU(K)=DX(K)
DIFX(2)=.5*(X(3)+X(2))-X(1)
DIFX(N)=X(NP1)-.5*(X(N)+X(NM1))
DIFXU(3)=X(3)-X(1)
DIFXU(N)=X(NP1)-X(NM1)
YV(2)=Y(1)
DO 60 I=3, L
60 YV(I)=0.5*(Y(I)+Y(I-1))
YV(LP1)=Y(LP1)
XU(1)=0.0
XU(2)=X(1)
DO 70 K=3, N
70 XU(K)=0.5*(X(K)+X(K-1))
XU(NP1)=X(NP1)
FUYBS=.25*(RM(3)+R(3))*DY(3)/RDIFYV(3)
FUYBSO=1.-FUYBS
FUYBN=1.-.25*(RM(L)+RM(LM1))*DY(L)/RDIFYV(L)
FUYBNO=1.-FUYBN
FXBL=0.5*DX(3)/DIFXU(3)
FXBLO=1.-FXBL
FXBR=DIFX(N)/DIFXU(N)
FXBRO=1.-FXBR

```

C-----

```

DO 75 K=3, N
A1(K)=DIFX(K)/DIFX(K-1)
A2(K)=DX(K-1)/DX(K)
IF(K.EQ.3) A2(K)=2.*A2(K)
Z1=1./(1.+A1(K))
Z2=1./(1.+A2(K))
Z3=Z1*Z2
C1(K)=1.-Z3/A1(K)+A1(K)*Z3-Z2*Z2/A1(K)
C2(K)=(1.+Z2)*Z3/A1(K)

```

```
C3(K)=1.-C1(K)-C2(K)
C4(K)=-A1(K)*Z3+Z3*Z2
C5(K)=-Z3*Z2*A2(K)/A1(K)
C6(K)=1.-C4(K)-C5(K)
```

```
75 CONTINUE
```

```
C
```

```
DO 76 K=3,NP1
76 A2(K)=DX(K-1)/DX(K)
DO 77 K=3,N
E1(K)=(2.+1./A2(K))/(4.*(1.+1./A2(K)))
E2(K)=(2.+1./A2(K))/4.
E3(K)=1.-E1(K)-E2(K)
E4(K)=(2.+A2(K+1))/4.
E5(K)=(2.+A2(K+1))/(4.*(1.+A2(K+1)))
E6(K)=1.-E4(K)-E5(K)
```

```
77 CONTINUE
```

```
C
```

```
DO 78 I=3,LP1
78 A2(I)=DY(I)/DY(I-1)
DO 79 I=3,L
D1(I)=(2.+A2(I))/(4.*(1.+A2(I)))
D2(I)=(2.+A2(I))/4.
D3(I)=1.-D1(I)-D2(I)
D4(I)=(2.+1./A2(I+1))/(4.*(1.+1./A2(I+1)))
D5(I)=(2.+1./A2(I+1))/4.
D6(I)=1.-D4(I)-D5(I)
```

```
79 CONTINUE
```

```
C
```

```
DO 80 I=3,L
YDIFM=2.*RDIFY(I-1)/(RM(I)+RM(I-1))
YDIFP=2.*RDIFY(I)/(RM(I+1)+RM(I))
A1(I)=YDIFP/YDIFM
A2(I)=DY(I-1)/DY(I)
IF(I.EQ.3) A2(I)=2.*A2(I)
Z1=1./(1.+A1(I))
Z2=1./(1.+A2(I))
Z3=Z1*Z2
G1(I)=1.-Z3/A1(I)+Z3*A1(I)-Z2*Z2/A1(I)
G2(I)=(1.+Z2)*Z3/A1(I)
G3(I)=1.-G1(I)-G2(I)
G4(I)=(A1(I)+Z2)*Z3
G5(I)=-Z3*Z2*A2(I)/A1(I)
G6(I)=1.-G4(I)-G5(I)
```

```
80 CONTINUE
```

```
RETURN
```

```
C
```

```
ENTRY COEFF2(F,GAM,RHO,P,U,V,W,Q,D,DP,VISMIXT,PRAD)
```

```
C
```

```
DO 8000 NC=1,NF
NV=NVORDR(NC)
IF(ICYCL(NV).EQ.0) GO TO 8000
```

```
C
```

```
C
```

```
-----
** V VELOCITY EQUATION **
-----
```

```
C
```

```
C
```

```
IF(NV.NE.NVV) GO TO 2000
ISTR=3
KSTR=2
CALL TRANSP(RHO,U,V,W,Q,D,GAM,F,VISMIXT,PRAD)
CALL PROBS1(F,GAM,RHO,U,V,W,Q,D,DP)
CALL SOURCE(F,U,V,W,Q,D,RHO,GAM,P,PRAD)
DO 215 K=2,N
DO 215 I=3,L
YDIFM=2.*RDIFY(I-1)/(RM(3)+RM(2))
PFV=PUV
```

```

      IK=I+KO(K)
      IKN=IK+1
      IKS=IK-1
      IKL=IK-KO(2)
      IKR=IK+KO(2)
      IKRS=IKR-1
      IKLS=IKL-1
      FACU=.25*(RM(I)+R(I))/RM(I)
      YDIFP=2.*RDIFY(I)/(RM(I+1)+RM(I))
      IF(K.EQ.2) GO TO 85
      RHOUL=GS(I)
      T1=TS(I)
      X11=YS(I,1)
      X12=YS(I,2)
      X13=YS(I,3)
      X14=YS(I,4)
      GO TO 100
85  RHOU=RHO(IKL)*U(IK)
      RHOUL=RHO(IKLS)*U(IKS)
      IF(I.EQ.3.OR.I.EQ.L) GO TO 87
      RHOUL=FACU*RHOU+(1.-FACU)*RHOUL
      GO TO 90
87  IF(I.EQ.L) GO TO 89
      RHOUL=FUYBS*RHOU+FUYBSO*RHOUL
      GO TO 90
89  RHOUL=FUYBN*RHOU+FUYBNO*RHOUL
90  CONTINUE
      T1=0.5*(GAM(IKL)+GAM(IKLS))/DX(K)
      X11=0.
      X14=0.
      IF(T1.LT.-RHOUL) GO TO 95
      X12=1.
      X13=0.
      GO TO 100
95  X12=0.
      X13=1.
      T1=0.
100 IF(K.EQ.N) GO TO 140
      RHOU=0.5*(RHO(IK)+RHO(IKR))*U(IKR)
      RHOUL=0.5*(RHO(IKS)+RHO(IKRS))*U(IKRS)
      IF(I.EQ.L.OR.I.EQ.3) GO TO 105
      RHOU=FACU*RHOU+(1.-FACU)*RHOUL
      GO TO 115
105 IF(I.EQ.L) GO TO 110
      RHOU=FUYBS*RHOU+FUYBSO*RHOUL
      GO TO 115
110 RHOU=FUYBN*RHOU+FUYBNO*RHOUL
115 CONTINUE
      GAMR=0.25*(GAM(IKR)+GAM(IKRS)+GAM(IKS)+GAM(IK))
      T2=GAMR/DX(K+1)
      X21=0.
      X22=0.
      X23=0.
      X24=0.
      IF(K.NE.2.AND.K.NE.(N-1)) GO TO 120
116 GXP=0.5*ABS(RHOU)
      IF(T2.LT.GXP) GO TO 130
      X22=0.5
      X23=0.5
      GO TO 135
120 PX=ABS(RHOU/T2)
      IF(PX.GT.PFV) GO TO 130.
      IF(RHOU.LT.0.) GO TO 125
      X21=E3(K+1)
      X22=E2(K+1)
      X23=E1(K+1)

```

```

      GO TO 135
125  X22=E5(K+1)
      X23=E4(K+1)
      X24=E6(K+1)
      GO TO 135
130  T2=0.
      IF(RHOU.GE.0.) X22=1.
      IF(RHOU.LT.0.) X23=1.
135  GS(I)=RHOU
      TS(I)=T2
      YS(I,1)=X21
      YS(I,2)=X22
      YS(I,3)=X23
      YS(I,4)=X24
      GO TO 150
140  RHOU=RHO(IKR)*U(IKR)
      RHOU1=RHO(IKRS)*U(IKRS)
      IF(I.EQ.3.OR.I.EQ.L) GO TO 142
      RHOU=FACU*RHOU+(1.-FACU)*RHOU1
      GO TO 144
142  IF(I.EQ.L) GO TO 143
      RHOU=FUYBS*RHOU+FUYBSO*RHOU1
      GO TO 144
143  RHOU=FUYBN*RHOU+FUYBNO*RHOU1
144  CONTINUE
      T2=0.5*(GAM(IKR)+GAM(IKRS))/DX(K+1)
      X21=0.
      X24=0.
      IF(T2.LT.RHOU) GO TO 145
      X22=0.
      X23=1.
      GO TO 150
145  X22=1.
      X23=0.
      T2=0.
150  IF(I.EQ.3) GO TO 155
      RHOVS=RHOV
      S1=S2
      Y11=Y21
      Y12=Y22
      Y13=Y23
      Y14=Y24
      GO TO 160
155  IKSS=IK-2
      RHOVS=R(1)*RHO(IKSS)*V(IKS)
      S1=2.*GAM(IKSS)*R(1)/RDIFY(I-1)
      Y11=0.
      Y14=0.
      IF(S1.LT.-RHOVS) GO TO 157
      Y12=1.
      Y13=0.
      GO TO 160
157  Y12=0.
      Y13=1.
      S1=0.
160  IF(I.EQ.L) GO TO 185
      FACV=.25*(RM(I)+R(I))*DY(I)/RDIFY(I)
      RHOV=0.5*RM(I+1)*(RHO(IK)+RHO(IKN))*V(IKN)
      RHOV1=0.5*RM(I)*(RHO(IKS)+RHO(IK))*V(IK)
      RHOV=FACV*RHOV+(1.-FACV)*RHOV1
      S2=2.*R(I)*GAM(IK)/RDIFY(I)
      Y21=0.
      Y22=0.
      Y23=0.
      Y24=0.
      IF(I.NE.3.AND.I.NE.(L-1)) GO TO 165

```

```

161 GRP=FACV*RHOV
    GR=(1.-FACV)*RHOV
    IF(S2.LT.GRP) GO TO 175
    IF(S2.LT.-GR) GO TO 175
    Y22=1.-FACV
    Y23=FACV
    GO TO 180
165 PY=ABS(RHOV/S2)
    IF(PY.GT.PFV) GO TO 175
    IF(RHOV.LT.0.) GO TO 170
    Y21=G3(I)
    Y22=G1(I)
    Y23=G2(I)
    GO TO 180
170 Y22=G4(I+1)
    Y23=G6(I+1)
    Y24=G5(I+1)
    GO TO 180
175 S2=0.
    IF(RHOV.GE.0.) Y22=1.
    IF(RHOV.LT.0.) Y23=1.
180 GO TO 195
185 RHOV=R(LP1)*RHO(IKN)*V(IKN)
    S2=2.*GAM(IKN)*R(LP1)/YDIFP
    Y21=0.
    Y24=0.
    IF(S2.LT.RHOV) GO TO 190
    Y22=0.
    Y23=1.
    GO TO 195
190 S2=0.
    Y22=1.
    Y23=0.
195 CONTINUE
    AN(IK)=(S2+Y14*RHOVS-Y23*RHOV)/RDIFYV(I)
    AS(IK)=(S1+Y12*RHOVS-Y21*RHOV)/RDIFYV(I)
    AR(IK)=(T2+X14*RHOUL-X23*RHO)/DIFX(K)
    AL(IK)=(T1+X12*RHOUL-X21*RHO)/DIFX(K)
    ANN=-Y24*RHOV/RDIFYV(I)
    ASS=Y11*RHOVS/RDIFYV(I)
    ARR=-X24*RHO/DIFX(K)
    ALL=X11*RHOUL/DIFX(K)
    SP(IK)=AN(IK)+AS(IK)+AR(IK)+AL(IK)-SP(IK)
    DIVG=(RHOV-RHOVS)/RDIFYV(I)+(RHO-RHOUL)/DIFX(K)
    DPDY=(P(IK)-P(IKS))/DY(I)
    SU(IK)=SU(IK)-DPDY
    IF(DIVG.LT.0.) GO TO 196
    SP(IK)=SP(IK)+DIVG
    SU(IK)=SU(IK)+DIVG*V(IK)
196 IF(KTIM.EQ.1) GO TO 200
    RDT=.5*(RHOFOLD(IK)+RHOFOLD(IKS))/DTIM
    IKNV=IK+NFO(NV)
    SU(IK)=SU(IK)+RDT*FOLD(IKNV)
    SP(IK)=SP(IK)+RDT
200 CONTINUE
    CALL ADJUST(F,NV,IK,ANN,ASS,ARR,ALL,SEXT)
    SU(IK)=SU(IK)+SEXT
    QV(IK)=RELAX(NV)/(SP(IK)*DY(I))
215 CONTINUE
    CALL PROBS2(F,GAM,RHO,U,V,W,Q,D,DP)
    CALL SWEEP(F)
    CALL PROBS3(F,GAM,RHO,U,V,W,Q,D,DP)
    GO TO 8000
2000 IF(NV.NE.NVW)GO TO 3000
C
    GO TO 8000

```

```

3000 IF(NV.NE.NVU) GO TO 5000
C -----
--
C ** U VELOCITY EQUATION **
C -----
-
ISTR=2
KSTR=3
CALL TRANSP(RHO,U,V,Q,D,GAM,F,VISMIXT,PRAD)
CALL PROBSI(F,GAM,RHO,U,V,W,Q,D,DP)
CALL SOURCE(F,U,V,W,Q,D,RHO,GAM,P,PRAD)
DO 415 I=2,L
DO 415 K=3,N
PFU=PUV
IK=I+KO(K)
IKN=IK+1
IKS=IK-1
IKL=IK-KO(2)
IKR=IK+KO(2)
IKLN=IKL+1
IKLS=IKL-1
IF(I.EQ.2) GO TO 305
RHOVS=GS(K)
S1=TS(K)
Y11=YS(K,1)
Y12=YS(K,2)
Y13=YS(K,3)
Y14=YS(K,4)
GO TO 310
305 RHOV=RHO(IKS)*V(IK)
RHOV1=RHO(IKLS)*V(IKL)
IF(K.EQ.3.OR.K.EQ.N) GO TO 306
RHOVS=0.5*R(1)*(RHOV+RHOV1)
C-----
GO TO 308
306 IF(K.EQ.N) GO TO 307
RHOVS=R(1)*(FXBL*RHOV+FXBLO*RHOV1)
GO TO 308
307 RHOVS=R(1)*(FXBR*RHOV+FXBRO*RHOV1)
308 CONTINUE
S1=0.5*(GAM(IKS)+GAM(IKLS))*R(1)/DY(I)
C-----
Y11=0.
Y14=0.
IF(S1.LT.-RHOVS) GO TO 309
Y12=1.
Y13=0.
GO TO 310
309 Y12=0.
Y13=1.
S1=0.
310 CONTINUE
IF(I.EQ.L) GO TO 340
RHOV=0.5*(RHO(IK)+RHO(IKN))*V(IKN)
RHOV1=0.5*(RHO(IKL)+RHO(IKLN))*V(IKLN)
IF(K.EQ.3.OR.K.EQ.N) GO TO 316
RHOV=0.5*RM(I+1)*(RHOV+RHOV1)
GO TO 319
316 IF(K.EQ.N) GO TO 318
RHOV=RM(I+1)*(FXBL*RHOV+FXBLO*RHOV1)
GO TO 319
318 RHOV=RM(I+1)*(FXBR*RHOV+FXBRO*RHOV1)
319 CONTINUE
GAMN=0.25*(GAM(IK)+GAM(IKL)+GAM(IKN)+GAM(IKLN))
S2=GAMN*RM(I+1)/DY(I+1)
Y21=0.

```

```

Y22=0.
Y23=0.
Y24=0.
IF(I.NE.2.AND.I.NE.(L-1)) GO TO 320
321 GRP=0.5*ABS(RHOV)
IF(S2.LT.GRP) GO TO 330
Y22=0.5
Y23=0.5
GO TO 335
320 PY=ABS(RHOV/S2)
IF(PY.GT.PFU) GO TO 330
IF(RHOV.LT.0.) GO TO 325
Y21=D3(I+1)
Y22=D2(I+1)
Y23=D1(I+1)
GO TO 335
325 Y22=D4(I+1)
Y23=D5(I+1)
Y24=D6(I+1)
GO TO 335
330 S2=0.
IF(RHOV.GE.0.) Y22=1.
IF(RHOV.LT.0.) Y23=1.
335 GS(K)=RHOV
TS(K)=S2
YS(K,1)=Y21
YS(K,2)=Y22
YS(K,3)=Y23
YS(K,4)=Y24
GO TO 350
340 RHOV=RHO(IKN)*V(IKN)
RHOV1=RHO(IKLN)*V(IKLN)
IF(K.EQ.3.OR.K.EQ.N) GO TO 342
RHOV=0.5*R(LP1)*(RHOV+RHOV1)

```

C-----

```

GO TO 344
342 IF(K.EQ.N) GO TO 343
RHOV=R(LP1)*(FXBL*RHOV+FXBLO*RHOV1)
GO TO 344
343 RHOV=R(LP1)*(FXBR*RHOV+FXBRO*RHOV1)
344 CONTINUE
S2=0.5*R(LP1)*(GAM(IKN)+GAM(IKLN))/DY(I+1)
Y21=0.
Y24=0.
IF(S2.LT.RHOV) GO TO 345
Y22=0.
Y23=1.
GO TO 350
345 Y22=1.
Y23=0.
S2=0.
350 CONTINUE

```

C-----

```

IF(K.EQ.3) GO TO 355
RHOUL=RHO
T1=T2
X11=X21
X12=X22
X13=X23
X14=X24
GO TO 357
355 IKLL=IKL-KO(2)
RHOUL=RHO(IKLL)*U(IKL)
T1=2.*GAM(IKLL)/DIFX(K-1)
X11=0.

```



```

X14=0.
IF(T1.LT.-RHOUL) GO TO 356
X12=1.
X13=0.
GO TO 357
356 X12=0.
X13=1.
T1=0.
357 IF(K.EQ.N) GO TO 380
FACP=DX(K)/(X(K+1)-X(K-1))
FACO=1.-FACP
RHOU=0.5*(RHO(IK)+RHO(IKL))*U(IK)
RHOUL=0.5*(RHO(IK)+RHO(IKR))*U(IKR)
RHOU=FACO*RHOU+FACP*RHOUL
T2=2.*GAM(IK)/DIFX(K)
X21=0.
X22=0.
X23=0.
X24=0.
IF(K.NE.3.AND.K.NE.(N-1)) GO TO 360
358 GXP=FACP*RHOU
GX=DX(K+1)*GXP/DX(K)
IF(T2.LT.GXP) GO TO 370
IF(T2.LT.-GX) GO TO 370
X22=FACO
X23=FACP
GO TO 375
360 PX=ABS(RHOU/T2)
IF(PX.GT.PFU) GO TO 370
IF(RHOU.LT.0.) GO TO 365
X21=C3(K)
X22=C1(K)
X23=C2(K)
GO TO 375
365 X22=C4(K+1)
X23=C6(K+1)
X24=C5(K+1)
GO TO 375
370 T2=0.
IF(RHOU.GE.0.) X22=1.
IF(RHOU.LT.0.) X23=1.
375 GO TO 390
380 RHOU=RHO(IKR)*U(IKR)
T2=2.*GAM(IKR)/DIFX(K)
X21=0.
X24=0.
IF(T2.LT.RHOU) GO TO 385
X22=0.
X23=1.
GO TO 390
385 T2=0.
X22=1.
X23=0.
390 CONTINUE
AN(IK)=(S2+Y14*RHOVS-Y23*RHOV)/RDIFY(I)
AS(IK)=(S1+Y12*RHOVS-Y21*RHOV)/RDIFY(I)
AR(IK)=(T2+X14*RHOUL-X23*RHOU)/DIFXU(K)
AL(IK)=(T1+RHOUL*X12-X21*RHOU)/DIFXU(K)
ANN=-Y24*RHOV/RDIFY(I)
ASS=Y11*RHOVS/RDIFY(I)
ARR=-X24*RHOU/DIFXU(K)
ALL=X11*RHOUL/DIFXU(K)
DIVG=(RHOV-RHOVS)/RDIFY(I)+(RHOU-RHOUL)/DIFXU(K)
SP(IK)=AN(IK)+AS(IK)+AR(IK)+AL(IK)-SP(IK)
DPDX=(P(IK)-P(IKL))/DX(K)
SU(IK)=SU(IK)-DPDX

```

```

IF(DIVG.LT.0.) GO TO 395
SP(IK)=SP(IK)+DIVG
SU(IK)=SU(IK)+DIVG*U(IK)
395 IF(KTIM.EQ.1) GO TO 400
RDT=.5*(RHOFOLD(IK)+RHOFOLD(IKL))/DTIM
IKNV=IK+NFO(NV)
SU(IK)=SU(IK)+RDT*FOLD(IKNV)
SP(IK)=SP(IK)+RDT
400 CONTINUE
CALL ADJUST(F,NV,IK,ANN,ASS,ARR,ALL,SEXT)
SU(IK)=SU(IK)+SEXT
QU(IK)=RELAX(NV)/(SP(IK)*DX(K))
415 CONTINUE
CALL PROBS2(F,GAM,RHO,U,V,W,Q,D,DP)
CALL SWEEP(F)
CALL PROBS3(F,GAM,RHO,U,V,W,Q,D,DP)
GO TO 8000
5000 IF(NV.NE.NVDP) GO TO 6000
C-----
-
C ** MASS CONSERVATION EQUATION **
C-----
---
```

```

ISTR=2
KSTR=2
CALL PROBS1(F,GAM,RHO,U,V,W,Q,D,DP)
DO 504 I=1,LP1
DO 504 K=1,NP1
IK=I+KO(K)
DP(IK)=0.0
504 CONTINUE
DO 570 I=2,L
DO 570 K=2,N
IK=I+KO(K)
IKN=IK+1
IKS=IK-1
IKL=IK-KO(2)
IKR=IK+KO(2)
IF(I.NE.2) GO TO 505
506 AS(IK)=0.0
GRM=R(1)*RHO(IKS)*V(IK)
GO TO 510
505 RQVS=TS(K)
GRM=GS(K)
AS(IK)=RQVS/RDIFY(I)
510 IF(I.EQ.L) GO TO 515
RRHON=.5*RM(I+1)*(RHO(IK)+RHO(IKN))
GRP=RRHON*V(IKN)
RQVN=RRHON*QV(IKN)
TS(K)=RQVN
GS(K)=GRP
AN(IK)=RQVN/RDIFY(I)
GO TO 540
515 GRP=R(LP1)*RHO(IKN)*V(IKN)
AN(IK)=0.0
540 CONTINUE
IF(K.NE.2) GO TO 545
546 AL(IK)=0.0
GXM=RHO(IKL)*U(IK)
GO TO 550
545 RQUL=RQUR
GXM=GXP
AL(IK)=RQUL/DIFX(K)
550 IF(K.EQ.N) GO TO 555
RHOR=.5*(RHO(IK)+RHO(IKR))
GXP=RHOR*U(IKR)

```

```

RQUR=RHOR*QU(IKR)
AR(IK)=RQUR/DIFX(K)
GO TO 560
555 GXP=RHO(IKR)*U(IKR)
AR(IK)=0.0
C CALCULATE MASS SOURCE
C WARNING ** DRODT OMITTED FROM CONTINUITY EQUATION **
560 SU(IK)=-((GRP-GRM)/RDIFY(I)+(GXP-GXM)/DIFX(K))
C
C RDT=(RHOFOLD(IK)-RHO(IK))/DTIM
C PRINT *,I,K,RDT
C SU(IK)=SU(IK)+RDT
C
SP(IK)=AN(IK)+AS(IK)+AR(IK)+AL(IK)
570 CONTINUE
CALL PROBS2(F,GAM,RHO,U,V,W,Q,D,DP)
CALL SWEEP(F)
C CORECT VELOSITIES TO CONSERVE MASS
DO 650 I=2,L
DO 650 K=2,N
IK=I+KO(K)
IKS=IK-1
IKL=IK-KO(2)
IF(I.EQ.2) GO TO 600
V(IK)=V(IK)-QV(IK)*(DP(IK)-DP(IKS))
600 IF(K.EQ.2) GO TO 650
U(IK)=U(IK)-QU(IK)*(DP(IK)-DP(IKL))
650 CONTINUE
CALL PROBS3(F,GAM,RHO,U,V,W,Q,D,DP)
DO 660 I=1,LP1
DO 660 K=1,NP1
IK=I+KO(K)
660 P(IK)=P(IK)+0.8*(DP(IK)-DP(IKREF))
GO TO 8000
C *** F EQUATIONS ****
6000 CONTINUE
ISTR=2
KSTR=2
CALL TRANSP(RHO,U,V,Q,D,GAM,F,VISMIXT,PRAD)
CALL PROBS1(F,GAM,RHO,U,V,W,Q,D,DP)
CALL SOURCE(F,U,V,W,Q,D,RHO,GAM,P,PRAD)
DO 800 I=2,L
DO 800 K=2,N
IK=I+KO(K)
IKN=IK+1
IKS=IK-1
IKL=IK-KO(2)
IKR=IK+KO(2)
IF(I.NE.2) GO TO 705
706 GRM=R(1)*RHO(IKS)*V(IK)
TRM=AMAX1(R(1)*GAM(IKS)/DY(I),-GRM)
GO TO 710
705 GRM=GS(K)
TRM=TS(K)
710 IF(I.EQ.L) GO TO 715
GRP=.25*(RHO(IK)+RHO(IKN))*RM(I+1)*V(IKN)
TRP=AMAX1(.5*(GAM(IK)+GAM(IKN))*RM(I+1)/DY(I+1),ABS(GRP))
GS(K)=GRP
TS(K)=TRP
GO TO 740
715 GRP=RHO(IKN)*R(LP1)*V(IKN)
TRP=AMAX1(R(LP1)*GAM(IKN)/DY(I+1),GRP)
740 CONTINUE
IF(K.NE.2) GO TO 745
741 GXM=RHO(IKL)*U(IK)
TXM=AMAX1(GAM(IKL)/DX(K),-GXM)

```

```

      GO TO 750
745  GXM=GXP
      TXM=TXP
750  IF(K.EQ.N) GO TO 755
      GXP=.25*(RHO(IK)+RHO(IKR))*U(IKR)
      TXP=AMAX1(.5*(GAM(IK)+GAM(IKR))/DX(K+1),ABS(GXP))
      GO TO 760
755  GXP=RHO(IKR)*U(IKR)
      TXP=AMAX1(GAM(IKR)/DX(K+1),GXP)
760  AN(IK)=(TRP-GRP)/RDIFY(I)
      AS(IK)=(TRM+GRM)/RDIFY(I)
      AR(IK)=(TXP-GXP)/DIFX(K)
      AL(IK)=(TXM+GXM)/DIFX(K) -
      SP(IK)=AN(IK)+AS(IK)+AR(IK)+AL(IK)-SP(IK)
      IF(I.EQ.ISTR) GRM=.5*GRM
      IF(K.EQ.KSTR) GXM=.5*GXM
      IF(I.EQ.L) GRP=.5*GRP
      IF(K.EQ.N) GXP=.5*GXP
      DIVG=2.*(GRP-GRM)/RDIFY(I)+(GXP-GXM)/DIFX(K)
      IKP=IK+NFO(NV)
      IF(DIVG.LT.0.) GO TO 765
      SP(IK)=SP(IK)+DIVG
      SU(IK)=SU(IK)+DIVG*F(IKP)
765  IF(KTIM.EQ.1) GO TO 800
      RDT=RHO(FOLD(IK)/DTIM)
      SU(IK)=SU(IK)+RDT*FOLD(IK+NFO(NV))
      SP(IK)=SP(IK)+RDT
800  CONTINUE
      CALL PROBS2(F,GAM,RHO,U,V,W,Q,D,DP)
      CALL SWEEP(F)
      CALL PROBS3(F,GAM,RHO,U,V,W,Q,D,DP)
8000 CONTINUE
      RETURN
      END

```

```

C      SUBROUTINE ADJUST(F,NV,IK,ANN,ASS,ARR,ALL,SEXT)

```

```

C      PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
      DIMENSION F(17*NXYZ)
      COMMON/CBCOEF/AN(NXYZ),AS(NXYZ),AR(NXYZ),AL(NXYZ),
1SP(NXYZ),SU(NXYZ),QU(NXYZ),QV(NXYZ)
      COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)

```

```

C      IKP=IK+NFO(NV)
      IKPN=IKP+1
      IKPS=IKP-1
      IKPR=IKP+KO(2)
      IKPL=IKP-KO(2)
      SEXT=0.
      IF(ALL.EQ.0.) GO TO 10
      IKPLL=IKPL-KO(2)
      SEXT=SEXT+ALL*(F(IKPLL)-F(IKP))
10  IF(ARR.EQ.0.) GO TO 20
      IKPRR=IKPR+KO(2)
      SEXT=SEXT+ARR*(F(IKPRR)-F(IKP))
20  IF(ASS.EQ.0.) GO TO 30
      IKPSS=IKPS-1
      SEXT=SEXT+ASS*(F(IKPSS)-F(IKP))
30  IF(ANN.EQ.0.) GO TO 40
      IKPNN=IKPN+1
      SEXT=SEXT+ANN*(F(IKPNN)-F(IKP))
40  CONTINUE
      ANN=0.
      ASS=0.
      ARR=0.

```

```

ALL=0.
C
  IF(AN(IK).GE.0.) GO TO 50
  SEXT=SEXT+AN(IK)*(F(IKPN)-F(IKP))
  SP(IK)=SP(IK)-AN(IK)
  AN(IK)=0.
50 IF(AS(IK).GE.0.) GO TO 60
  SEXT=SEXT+AS(IK)*(F(IKPS)-F(IKP))
  SP(IK)=SP(IK)-AS(IK)
  AS(IK)=0.
60 IF(AL(IK).GE.0.) GO TO 70
  SEXT=SEXT+AL(IK)*(F(IKPL)-F(IKP))
  SP(IK)=SP(IK)-AL(IK)
  AL(IK)=0.
70 IF(AR(IK).GE.0.) GO TO 80
  SEXT=SEXT+AR(IK)*(F(IKPR)-F(IKP))
  SP(IK)=SP(IK)-AR(IK)
  AR(IK)=0.
80 CONTINUE
  RETURN
  END
C
  SUBROUTINE SWEEP(F)
C
  PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
  DIMENSION A(NS),B(NS)
  DIMENSION F(17*NXYZ),GAM(NXYZ)
  COMMON/CBCOEF/AN(NXYZ),AS(NXYZ),AR(NXYZ),AL(NXYZ),
  1SP(NXYZ),SU(NXYZ),QU(NXYZ),QV(NXYZ)
  COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
  1TITLE(6,20),PR(20),PRT(20)
  COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
  1NVORDR(20)
  COMMON/CBFUEL/AA,BB,RHOAIR,TEMPAD,OXYG1
  COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
  1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
  1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVEF,
  1NVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
  COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
  1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
  COMMON/CSTORE/TS(NS),YS(NS,4),GS(NS)
  DATA ZERO/1.E-10/
C
  IF(ITEST.GT.1) CALL TEST(1,F,GAM)
  IF(ITEST.GT.0.AND.NV.NE.NVDP) CALL TEST(2,F,GAM)
  RELAXO=1.-RELAX(NV)
  DO 50 I=ISTR,L
  DO 50 K=KSTR,N
  IK=I+KO(K)
  IF(ABS(SP(IK)).LT.ZERO) SP(IK)=0.0
  IF(ABS(SU(IK)).LT.ZERO) SU(IK)=0.0
  IF(ABS(AN(IK)).LT.ZERO) AN(IK)=0.0
  IF(ABS(AS(IK)).LT.ZERO) AS(IK)=0.0
  IF(ABS(AR(IK)).LT.ZERO) AR(IK)=0.0
  IF(ABS(AL(IK)).LT.ZERO) AL(IK)=0.0
  AN(IK)=AN(IK)*RELAX(NV)
  AS(IK)=AS(IK)*RELAX(NV)
  AL(IK)=AL(IK)*RELAX(NV)
  AR(IK)=AR(IK)*RELAX(NV)
  SU(IK)=RELAX(NV)*SU(IK)
  IF(NV.EQ.NVDP) GO TO 50
  IKP=IK+NFO(NV)
  IF(ABS(F(IKP)).LT.ZERO) F(IKP)=0.0
  SU(IK)=SU(IK)+RELAXO*F(IKP)*SP(IK)

```

```

        IF(ABS(SU(IK)).LT.ZERO) SU(IK)=0.0
50 CONTINUE
        ISUM=ISTR+L
        KSUM=KSTR+N
        ISTR1=ISTR-1
        KSTR1=KSTR-1
        NCYCL=0
        ISW=1
        KSW=1
C
80 NCYCL=NCYCL+1
C   IF(NV.EQ.NVD) PRINT *, '1'
        DO 150 KK=KSTR,N
        GO TO (104,105),KSW
104 K=KK
        GO TO 106
105 K=KSUM-KK
106 A(ISTR1)=0.
        IKS=ISTR1+KO(K)+NFO(NV)
        B(ISTR1)=F(IKS)
        DO 120 I=ISTR,L
        IK=I+KO(K)+NFO(NV)
        IKL=IK-KO(2)
        IKR=IK+KO(2)
        IKP=IK
        IK=NFO(NV)
        IF(ABS(SP(IK)).LT.ZERO) SP(IK)=0.0
        IF(ABS(SU(IK)).LT.ZERO) SU(IK)=0.0
        IF(ABS(AN(IK)).LT.ZERO) AN(IK)=0.0
        IF(ABS(AS(IK)).LT.ZERO) AS(IK)=0.0
        IF(ABS(AR(IK)).LT.ZERO) AR(IK)=0.0
        IF(ABS(AL(IK)).LT.ZERO) AL(IK)=0.0
        IF(ABS(F(IKL)).LT.ZERO) F(IKL)=0.0
        IF(ABS(F(IKR)).LT.ZERO) F(IKR)=0.0
        IF(ABS(F(IKP)).LT.ZERO) F(IKP)=0.0
        IF(ABS(F(IK)).LT.ZERO) F(IK)=0.0
        IF(ABS(A(I)).LT.ZERO) A(I)=0.0
        IF(ABS(B(I)).LT.ZERO) B(I)=0.0
        IF(ABS(A(I-1)).LT.ZERO) A(I-1)=0.0
        IF(ABS(B(I-1)).LT.ZERO) B(I-1)=0.0
        STORE=SP(IK)-AS(IK)*A(I-1)
        IF(ABS(STORE).LE.ZERO) GOTO 121
        A(I)=AN(IK)/STORE
121 CONTINUE
        IF(NV.EQ.NVD.AND.B(I-1).LT.ZERO) B(I-1)=0.0
        IF(NV.EQ.NVD.AND.B(I-1).GT.1.E20) B(I-1)=1.E20
C   IF(NV.EQ.NVD) PRINT *, I, K, AS(IK), B(I-1), SU(IK), AL(IK),
C   IF(IKL), AR(IK), F(IKR)
        B(I)=(AS(IK)*B(I-1)+SU(IK)+AL(IK)*F(IKL)+AR(IK)*F(IKR))
        IF(ABS(B(I)).LE.ZERO) B(I)=0.0
        IF(NV.EQ.NVD.AND.B(I).LT.ZERO) B(I)=0.0
        IF(NV.EQ.NVD.AND.B(I).GT.1.E20) B(I)=1.E20
        IF(NV.EQ.NVDP) B(I)=B(I)+RELAXO*F(IKP)*SP(IK)
        IF(ABS(B(I)).LT.ZERO) B(I)=0.0
        IF(ABS(STORE).LE.ZERO) GOTO 122
        B(I)=B(I)/STORE
122 CONTINUE
        IF(NV.EQ.NVD.AND.B(I).LT.ZERO) B(I)=0.0
        IF(NV.EQ.NVD.AND.B(I).GT.1.E20) B(I)=1.E20
        IF(ABS(B(I)).LT.ZERO) B(I)=0.0
120 CONTINUE
C   IF(NV.EQ.NVD) PRINT *, '2'
        DO 130 II=ISTR,L
        I=ISUM-II
        IK=I+KO(K)+NFO(NV)
        IKN=IK+1

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IF (ABS (F (IKN)) .LT. ZERO) F (IKN) = 0.0
F (IK) = A (I) * F (IKN) + B (I)
IF (ABS (F (IK)) .LT. ZERO) F (IK) = 0.0
C-----
IF (NV .EQ. NVF) F (IK) = AMAX1 (ZERO, AMIN1 (1.0, F (IK)))
IF (NV .NE. NVD) GO TO 130
IKF = IK - NFO (NV)
FMAX = BB / (AA + BB)
ZMAX = AA * F (IKF + NFO (NVF))
IF (F (IKF + NFO (NVF)) .GT. FMAX) ZMAX = BB * (1.0 - F (IKF + NFO (NVF)))
F (IK) = AMAX1 (ZERO, AMIN1 (ZMAX, F (IK)))
C-----
130 CONTINUE
C IF (NV .EQ. NVD) PRINT *, '3'
150 CONTINUE
C IF (NV .EQ. NVD) PRINT *, '4'
DO 350 II = ISTR, L
GO TO (301, 302), ISW
301 I = II
GO TO 306
302 I = ISUM - II
306 I = I + NFO (NV)
A (KSTR1) = 0.0
IKL = I + KO (KSTR1)
B (KSTR1) = F (IKL)
C IF (NV .EQ. NVD) PRINT *, '5'
DO 320 KK = KSTR, N
K = KK
IK = I + KO (K)
IKN = IK + 1
IKS = IK - 1
IKP = IK
IK = IK - NFO (NV)
IF (ABS (F (IKN)) .LT. ZERO) F (IKN) = 0.0
IF (ABS (F (IKS)) .LT. ZERO) F (IKS) = 0.0
IF (ABS (SP (IK)) .LT. ZERO) SP (IK) = 0.0
IF (ABS (SU (IK)) .LT. ZERO) SU (IK) = 0.0
IF (ABS (AN (IK)) .LT. ZERO) AN (IK) = 0.0
IF (ABS (AS (IK)) .LT. ZERO) AS (IK) = 0.0
IF (ABS (AR (IK)) .LT. ZERO) AR (IK) = 0.0
IF (ABS (AL (IK)) .LT. ZERO) AL (IK) = 0.0
IF (ABS (F (IKL)) .LT. ZERO) F (IKL) = 0.0
IF (ABS (F (IKR)) .LT. ZERO) F (IKR) = 0.0
IF (ABS (F (IKP)) .LT. ZERO) F (IKP) = 0.0
IF (ABS (F (IK)) .LT. ZERO) F (IK) = 0.0
IF (ABS (A (K)) .LT. ZERO) A (K) = 0.0
IF (ABS (B (K)) .LT. ZERO) B (K) = 0.0
IF (ABS (A (K - 1)) .LT. ZERO) A (K - 1) = 0.0
IF (ABS (B (K - 1)) .LT. ZERO) B (K - 1) = 0.0
STORE = SP (IK) - AL (IK) * A (K - 1)
IF (ABS (STORE) .LE. ZERO) GOTO 321
A (K) = AR (IK) / STORE
321 CONTINUE
IF (ABS (A (K)) .LT. ZERO) A (K) = 0.0
IF (NV .EQ. NVD .AND. B (K - 1) .LT. ZERO) B (K - 1) = 0.0
IF (NV .EQ. NVD .AND. B (K - 1) .GT. 1.E20) B (K - 1) = 1.E20
C IF (NV .EQ. NVD) PRINT *, I, K, AL (IK), B (K - 1), SU (IK), AN (IK),
C 1F (IKN), AS (IK), F (IKS)
B (K) = (AL (IK) * B (K - 1) + SU (IK) + AN (IK) * F (IKN) + AS (IK) * F (IKS))
IF (ABS (B (K)) .LT. ZERO) B (K) = 0.0
IF (NV .EQ. NVD .AND. B (K) .LT. ZERO) B (K) = 0.0
IF (NV .EQ. NVD .AND. B (K) .GT. 1.E20) B (K) = 1.E20
IF (NV .EQ. NVD) B (K) = B (K) + RELAXO * F (IKP) * SP (IK)
IF (ABS (STORE) .LE. ZERO) GOTO 322
B (K) = B (K) / STORE
322 CONTINUE

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```

IF(NV.EQ.NVD.AND.B(K).LT.ZERO) B(K)=0.0
IF(NV.EQ.NVD.AND.B(K).GT.1.E20) B(K)=1.E20
IF(ABS(B(K)).LT.ZERO) B(K)=0.0
320 CONTINUE
C   IF(NV.EQ.NVD) PRINT *, '6'
DO 330 KK=KSTR,N
K=KSUM-KK
IK=I+KO(K)
IKR=IK+KO(2)
IF(ABS(F(IKR)).LT.ZERO) F(IKR)=0.0
F(IK)=A(K)*F(IKR)+B(K)
IF(ABS(F(IK)).LT.ZERO) F(IK)=0.0
C-----
IF(NV.EQ.NVF) F(IK)=AMAX1(ZERO,AMIN1(1.0,F(IK)))
IF(NV.NE.NVD) GO TO 330
IKF=IK-NFO(NV)
FMAX=BB/(AA+BB)
ZMAX=AA*F(IKF+NFO(NVF))
IF(F(IKF+NFO(NVF)).GT.FMAX) ZMAX=BB*(1.0-F(IKF+NFO(NVF)))
F(IK)=AMAX1(ZERO,AMIN1(ZMAX,F(IK)))
C-----
330 CONTINUE
C   IF(NV.EQ.NVD) PRINT *, '7'
350 CONTINUE
C   IF(NV.EQ.NVD) PRINT *, '8'
IF(NCYCL.LT.ICYCL(NV)) GO TO 80
IF(ITEST.GT.0.AND.NV.EQ.NVDP) CALL TEST(2,F,GAM)
RETURN
END
C
SUBROUTINE SOURCE(F,U,V,W,Q,D,RHO,GAM,P,PRAD)
PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
DIMENSION F(17*NXYZ),GAM(NXYZ),P(NXYZ),RHO(NXYZ)
DIMENSION U(NXYZ),V(NXYZ),W(NXYZ),DP(NXYZ),Q(NXYZ),
1D(NXYZ),TEMP(NXYZ),PSI(NXYZ),PRAD(NXYZ)
COMMON/CBCOEF/AN(NXYZ),AS(NXYZ),AR(NXYZ),AL(NXYZ),
1SP(NXYZ),SU(NXYZ),QU(NXYZ),QV(NXYZ)
COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
1TITLE(6,20),PR(20),PRT(20)
COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)
COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVFF,
1NVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
COMMON/CGRID/DY(NY),DX(NX),RDIFY(NY),RDIFYV(NY),
1DIFX(NX),DIFXU(NX),RM(NY),YV(NY),XU(NX)
COMMON/CTURB/AK,CD1,CD2,CM,CD,EWALL,RED
COMMON/CPROP/CP,GASCON,RHOREF,VISCO,WAIR
COMMON/OBSTACL/IARX,ITEL,KARX,KTEL,IFARX,IFTEL,IIN1,IIS1,
1KKW1,KKE1,IIN2,IIS2,UFU,RHOFU,RKE(NXYZ),DIK(NXYZ),RLU(NXYZ),
1RLV(NXYZ),RLUV(NXYZ),FIKL(NY),FIKR(NY),FIKN(NX),FIKS(NX)
COMMON/UVRMS/URMS(NXYZ),VRMS(NXYZ),UMESO(NXYZ),VMESO(NXYZ),
1QMESO(NXYZ),DMESO(NXYZ),ARXEI1(NXYZ),ARXEI2(NXYZ),ARXEI3(NXYZ),
1ARXEI4(NXYZ),PMESO(NXYZ),ARXEI5(NXYZ),ARXEI6(NXYZ),ARXEI7(NXYZ),
1ARXEI8(NXYZ),ARXEI9(NXYZ),ARXEI10(NXYZ),QTOTAL(NXYZ)
1,PRMS1(NXYZ),UR1(NXYZ),UR2(NXYZ),VR1(NXYZ),VR2(NXYZ),COMESO
(NXYZ)
1,ARXEI11(NXYZ),TMESO(NXYZ),ARXEI12(NXYZ),FMESO(NXYZ)
COMMON/COEMFF/EMUTFF(NXYZ)
COMMON/FDUT/FDOT(NXYZ)
COMMON/FIII/FII(NXYZ),FLLL(NXYZ)

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```

DATA ZERO/1.E-10/
C
IF(NV.NE.NVV) GO TO 1000
C
DO 190 I=ISTR,L
DO 190 K=KSTR,N
IK=I+KO(K)
IKN=IK+1
IKS=IK-1
IKL=IK-KO(2)
IKR=IK+KO(2)
IKRS=IKR-1
IKLS=IKL-1
IF(K.NE.KSTR) GO TO 150
151 GMDUM=.5*(GAM(IKL)+GAM(IKLS))*(U(IK)-U(IKS))
GO TO 160
150 GMDUM=GMDUP
160 IF(K.EQ.N) GO TO 170
GMDUP=.25*(GAM(IK)+GAM(IKR)+GAM(IKRS)+GAM(IKS))*
1 (U(IKR)-U(IKRS))
GO TO 180
170 GMDUP=.5*(GAM(IKR)+GAM(IKRS))*(U(IKR)-U(IKRS))
180 SU(IK)=(GMDUP-GMDUM)/(DIFX(K)*DY(I))
GRAV=9.81
RHOV=.5*(RHO(IK)+RHO(IKS))
RHOM=RHOV-RHOREF
SU(IK)=SU(IK)-RHOM*GRAV
IF(KRAD.EQ.1) GO TO 190
SP(IK)=- (GAM(IK)+GAM(IKS))/RM(I)**2
WAV=.5*(R(I)*W(IK)+R(I-1)*W(IKS))/RM(I)
SU(IK)=SU(IK)+.5*(RHO(IK)+RHO(IKS))*WAV**2/RM(I)
190 CONTINUE
C
1000 IF(NV.NE.NVW) GO TO 2000
C
DO 290 I=ISTR,L
DO 290 K=KSTR,N
IK=I+KO(K)
SU(IK)=0.
SP(IK)=0.
290 CONTINUE
C
2000 IF(NV.NE.NVU) GO TO 3000
C
DO 390 K=KSTR,N
DO 390 I=ISTR,L
RP=.5*(RM(I+1)+RM(I))
IK=I+KO(K)
IKN=IK+1
IKS=IK-1
IKL=IK-KO(2)
IKR=IK+KO(2)
IKLN=IKL+1
IKLS=IKL-1
SU(IK)=0.0
SP(IK)=0.0
IF(I.NE.ISTR) GO TO 310
309 RGMDV=.5*(GAM(IKS)+GAM(IKLS))*R(I)*(V(IK)-V(IKL))
GO TO 320
310 RGMDV=RGMDVP
320 IF(I.EQ.L) GO TO 330
RGMDVP=.25*(GAM(IK)+GAM(IKN)+GAM(IKLN)+GAM(IKL))*RM(I+1)*
1 (V(IKN)-V(IKLN))
GO TO 340
330 RGMDVP=.5*(GAM(IKN)+GAM(IKLN))*R(LP1)*(V(IKN)-V(IKLN))
C-----

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VAV=(1.-FACR)*V(IK)+FACR*V(IKN)
SU(IK)=SU(IK)+(VAV/R(I))**2
2408 SU(IK)=2.*SU(IK)+(R(I)*DWBRDY)**2+DUDY**2+DVDX**2+DWDX**2
RLUV(IK)=RLUV(IK)*FMM
IF(RLUV(IK).LT.0.09) RLUV(IK)=0.09
EMUT=RHO(IK)*RLUV(IK)*DDD*SQRT(F(IKP))
SU(IK)=EMUT*SU(IK)
SP(IK)=-.666667*(RHO(IK)+EMUT*SP(IK)/F(IKP))*SP(IK)
IF(SP(IK).LT.0.) GO TO 2410
SU(IK)=SU(IK)+SP(IK)*F(IKP)
SP(IK)=0.
2410 CONTINUE
DDE=0.92*F(IKP)**1.5/DDD
SP(IK)=SP(IK)-RHO(IK)*DDE/F(IKP)
COOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
650 CONTINUE
C
4000 IF(NV.NE.NVF) GO TO 5000
C
DO 550 I=ISTR,L
DO 550 K=KSTR,N
IK=I+KO(K)
SU(IK)=0.
SP(IK)=0.
550 CONTINUE
C
5000 IF(NV.NE.NVD) GO TO 6000
DO 5001 I=ISTR,L
DO 5001 K=KSTR,N
IK=I+KO(K)
IKP=IK+NFO(NV)
DDD=SQRT(DIFX(K)*RDIFY(I))
FLDF=SQRT(F(IK+NFO(NVK)))/DDD
FLDF=1./(FLDF+1.E-10)
FLLL(IK)=-1.E-3/FLDF
FLLL(IK)=EXP(FLLL(IK))
C PRINT *,I,K,F(IK+NFO(NVF)),FLLL,EXP(FLLL)
FDOTIK=ABS(FDOT(IK))
FDOTIK=1./(FDOTIK+1.E-10)
C PRINT *,FII(IK),F(IK+NFO(NVF)),FDOTIK,FLDF,F(IK+NFO(NVT))
FII(IK)=0.
IF(F(IK+NFO(NVF)).GT.0.325.OR.F(IK+NFO(NVF)).LT.0.0177) GOTO
4504
CC IF(F(IK+NFO(NVF)).LT.0.35.AND.F(IK+NFO(NVF)).GT.0.025) GOTO
5003
C-----
CC DFDX=(F(IK+NFO(NVF))-F(IKL+NFO(NVF)))/DX(K)
CC DFDY=(F(IK+NFO(NVF))-F(IKS+NFO(NVF)))/DY(I)
CC FLDF=2.*VISCO/PRAD(IK)*(DFDX**2+DFDY**2)
CC PRINT *,I,K,FDOTIK,FLDF
C-----
CC PRINT *,FII(IK),F(IK+NFO(NVF)),FDOTIK,FLDF,F(IK+NFO(NVT))
IF(FDOTIK.GT.FLDF) GO TO 5003
4504 IF(FDOT(IK).LT.0.0) GO TO 5002
C-----
SU(IK)=RHO(IK)*FDOT(IK)
GO TO 5001
5002 SMA=0.0
IF(F(IKP).EQ.0.0) SMA=1.E-10
SP(IK)=RHO(IK)*FDOT(IK)/(F(IKP)+SMA)
GO TO 5001
5003 CONTINUE
FII(IK)=2.
C PRINT *,FII(IK),F(IK+NFO(NVF)),FDOTIK,FLDF,F(IK+NFO(NVT))
FDOT(IK)=0.0
SU(IK)=RHO(IK)*FDOT(IK)

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5001 CONTINUE
C
6000 IF(NV.NE.NVNO) GO TO 7000
C
      DO 750 I=ISTR,L
      DO 750 K=KSTR,N
      IK=I+KO(K)
750 SP(IK)=0.
C
7000 CONTINUE
C
      IF(ITEST.GT.1) CALL TEST(3,F,GAM)
      RETURN
      END
C
      SUBROUTINE  TRANSP(RHO,U,V,Q,D,GAM,F,VISMIXT,PRAD)
C
      PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
      DIMENSION F(17*NXYZ),GAM(NXYZ),P(NXYZ),RHO(NXYZ)
      DIMENSION U(NXYZ),V(NXYZ),W(NXYZ),DP(NXYZ),Q(NXYZ),
1D(NXYZ),VISMIXT(NXYZ),PRAD(NXYZ)
      COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
1TITLE(6,20),PR(20),PRT(20)
      COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)
      COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVFF,
1NVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
      COMMON/CGRID/DY(NY),DX(NX),RDIFY(NY),RDIFYV(NY),
1DIFX(NX),DIFXU(NX),RM(NY),YV(NY),XU(NX)
      COMMON/CTURB/AK,CD1,CD2,CM,CD,EWALL,RED
      COMMON/CPROP/CP,GASCON,RHOREF,VISCO,WAIR
      COMMON/OBSTACL/IARX,ITEL,KARX,KTEL,IFARX,IFTEL,IIN1,IIS1,
1KKW1,KKE1,IIN2,IIS2,UFU,RHOFU,RKE(NXYZ),DIK(NXYZ),RLU(NXYZ),
1RLV(NXYZ),RLUV(NXYZ),FIKL(NY),FIKR(NY),FIKN(NX),FIKS(NX)
      COMMON/UVRMS/URMS(NXYZ),VRMS(NXYZ),UMESO(NXYZ),VMESO(NXYZ),
1QMESO(NXYZ),DMESO(NXYZ),ARXEI1(NXYZ),ARXEI2(NXYZ),ARXEI3(NXYZ),
1ARXEI4(NXYZ),PMESO(NXYZ),ARXEI5(NXYZ),ARXEI6(NXYZ),ARXEI7(NXYZ),
1ARXEI8(NXYZ),ARXEI9(NXYZ),ARXEI10(NXYZ),QTOTAL(NXYZ)
1,PRMS1(NXYZ),UR1(NXYZ),UR2(NXYZ),VR1(NXYZ),VR2(NXYZ),COMESO
(NXYZ)
1,ARXEI11(NXYZ),TMESO(NXYZ),ARXEI12(NXYZ),FMESO(NXYZ)
      DATA ZERO/1.E-10/
C
      IF(NV.NE.NVV.AND.NV.NE.NVU.AND.NV.NE.NVW) GO TO 100
      DO 5000 I=2,LP1
      DO 5000 K=1,NP1
      IK=I+KO(K)
      GAM(IK)=VISCO+VISMIXT(IK)
      IF(I.EQ.1.OR.I.EQ.LP1.OR.K.EQ.1.OR.K.EQ.NP1) GOTO 50
      IF(I.EQ.L) GO TO 50
      IF(K.EQ.2) GO TO 50
      IF(F(IK+NFO(NVK)).LE.ZERO) GOTO 50
      IF(I.GE.IIN2) GOTO 53
      IF(I.GT.IIS1.AND.I.LT.KKW1.AND.K.LE.IIS2) GOTO 403
      GO TO 601
53 CONTINUE
      DYW=Y(LP1)-Y(I)
      UUU=ABS(U(IK))
      UUU=SQRT(GAM(IK)*UUU/DYW/RHO(IK))
      RYY=SQRT(UUU)*DYW*RHO(IK)/GAM(IK)

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      FMM=1.-EXP(-RYY*RYY/625.)
      DDD=SQRT(DIFX(K)*RDIFY(I))
      DDD=AMIN1(DDD,0.92*DYW)
      GOTO 600
403  CONTINUE
      DXW=X(K)
      VVV=ABS(V(IK))
      VVV=SQRT(GAM(IK)*VVV/DXW/RHO(IK))
      RYY=SQRT(VVV)*DXW*RHO(IK)/GAM(IK)
      FMM=1.-EXP(-RYY*RYY/625.)
      DDD=SQRT(DIFX(K)*RDIFY(I))
      DDD=AMIN1(DDD,0.92*DXW)
      GOTO 600
601  CONTINUE
      FMM=1.
      DDD=SQRT(DIFX(K)*RDIFY(I))
600  CONTINUE
C-----
      RLUV(IK)=RLUV(IK)*FMM
      IF(RLUV(IK).LT.0.09) RLUV(IK)=0.09
      GAM(IK)=GAM(IK)+RHO(IK)*RLUV(IK)*DDD*SQRT(F(IK+NFO(NVK)))
C-----
      GO TO 5000
50  CONTINUE
      GAM(IK)=VISCO
5000 CONTINUE
      RETURN
100  IF(NV.NE.NVD) GO TO 200
      RETURN
200  IF(NV.NE.NVK.AND.NV.NE.NVD.AND.NV.NE.NVF) GO TO 300
      DO 1151 I=2,LP1
      DO 1151 K=1,NP1
      IK=I+KO(K)
      IKP=IK+NFO(NVK)
      GAM(IK)=VISCO+VISMIXT(IK)/PRAD(IK)
      IF(I.EQ.1.OR.I.EQ.LP1.OR.K.EQ.1.OR.K.EQ.NP1) GOTO 1150
      IF(I.EQ.L) GO TO 1150
      IF(K.EQ.2) GO TO 1150
      IF(F(IK+NFO(NVK)).LE.ZERO) GO TO 1150
      IF(I.GE.IIN2) GO TO 1153
      IF(I.GT.IIS1.AND.I.LT.KKW1.AND.K.LE.IIS2) GO TO 2403
      GO TO 2601
1153 CONTINUE
      DYW=Y(LP1)-Y(I)
      UUU=ABS(U(IK))
      UUU=SQRT(GAM(IK)*UUU/DYW/RHO(IK))
      RYY=SQRT(UUU)*DYW*RHO(IK)/GAM(IK)
      FMM=1.-EXP(-RYY*RYY/625.)
      DDD=SQRT(DIFX(K)*RDIFY(I))
      DDD=AMIN1(DDD,0.92*DYW)
      GOTO 2600
2403 CONTINUE
      DXW=X(K)
      VVV=ABS(V(IK))
      VVV=SQRT(GAM(IK)*VVV/DXW/RHO(IK))
      RYY=SQRT(VVV)*DXW*RHO(IK)/GAM(IK)
      FMM=1.-EXP(-RYY*RYY/625.)
      DDD=SQRT(DIFX(K)*RDIFY(I))
      DDD=AMIN1(DDD,0.92*DXW)
      GOTO 2600
2601 CONTINUE
      FMM=1.
      DDD=SQRT(DIFX(K)*RDIFY(I))
2600 CONTINUE
C-----
      RLUV(IK)=RLUV(IK)*FMM

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      IF (RLUV(IK) .LT. 0.09) RLUV(IK) = 0.09
      GAM(IK) = GAM(IK) + RHO(IK) * RLUV(IK) * DDD * SQRT ( F ( IK + NFO ( NVK ) ) )
C-----
      GO TO 1151
1150 CONTINUE
      GAM(IK) = VISCO
1151 CONTINUE
300 CONTINUE
      RETURN
      END
C
      SUBROUTINE THERMP ( RHO, F, TEMP, VISMIXT, PRAD )
      PARAMETER ( NX = 59, NY = 59, NS = 59, NXYZ = 3481 )
      DIMENSION F ( 17 * NXYZ ), GAM ( NXYZ ), P ( NXYZ ), RHO ( NXYZ )
      DIMENSION U ( NXYZ ), V ( NXYZ ), W ( NXYZ ), DP ( NXYZ ), Q ( NXYZ ),
1D ( NXYZ ), TEMP ( NXYZ ), PSI ( NXYZ ), VISMIXT ( NXYZ ), PRAD ( NXYZ )
      COMMON / CBCOEF / AN ( NXYZ ), AS ( NXYZ ), AR ( NXYZ ), AL ( NXYZ ),
1SP ( NXYZ ), SU ( NXYZ ), QU ( NXYZ ), QV ( NXYZ )
      COMMON / GENRAL / R ( NY ), X ( NX ), Y ( NY ), RELAX ( 20 ), RESID ( 20 ),
1TITLE ( 6, 20 ), PR ( 20 ), PRT ( 20 )
      COMMON / CBLK1 / ICYCL ( 20 ), IPRINT ( 20 ), KO ( NX ), NFO ( 20 ),
1NVORDR ( 20 )
      COMMON / CBLK2 / ISTEP, KRAD, KTIM, IMAX, KMAX, L, LP1, N, NP1,
1ISTR, KSTR, ISKIP, KSKIP, NSKIP, IDMX, KDMX, IKREF, IBURN,
1ITEST, ISTOP, LSTEP, NCYCL, NF, NV, NVU, NVV, NVW, NVDP, NVK, NVD, NVF, NVFF,
1INVNO, NVT, NVP, NVRHO, NVCO, NVCO2, NVHC, NVH2, NVH2O, NVO2, NVN2, NMAX
COMMON / CBLK3 / DMAX, DSUM, DTIM, FLOIN, FLOUT1, FLOUT2, PRESS, TIM, TLAST,
1F1A, F2A, ATOT1, ATOT2, FLOC, FLOINFU
COMMON / CTURB / AK, CD1, CD2, CM, CD, EWALL, RED
COMMON / CPROP / CP, GASCON, RHOREF, VISCO, WAIR
COMMON / CBFUEL / AA, BB, RHOAIR, TEMPAD, OXYG1
COMMON / FDUT / FDOT ( NXYZ )
COMMON / FIII / FII ( NXYZ ), FLLL ( NXYZ )
C
      DATA ZERO / 1.E-10 /
C
61 FORMAT ( F9.6, 1X, E12.6, 1X, E12.6, 1X, E12.6 )
C
      DO 1010 I = 1, LP1
      DO 1010 K = 1, NP1
      IK = I + KO ( K )
      IKCO = IK + NFO ( NVCO )
      IKCO2 = IK + NFO ( NVCO2 )
      IKHC = IK + NFO ( NVHC )
      IKH2O = IK + NFO ( NVH2O )
      IKO2 = IK + NFO ( NVO2 )
      IKN2 = IK + NFO ( NVN2 )
C
      RHOLD = RHO ( IK )
C
      IKP = IK + NFO ( NVF )
C-----
C      FS1 = AMAX1 ( ZERO, AMIN1 ( 1.0, F ( IKP ) ) )
C      IKF = IK + NFO ( NVD )
C      FMAX = BB / ( AA + BB )
C      ZMAX = AA * FS1
C      IF ( FS1 .GT. FMAX ) ZMAX = BB * ( 1.0 - FS1 )
C      FS2 = AMAX1 ( ZERO, AMIN1 ( ZMAX, F ( IKF ) ) )
C-----
      FS1 = F ( IK + NFO ( NVF ) )
      FS2 = F ( IK + NFO ( NVD ) )
C-----
      CALL PARTEQ ( 0, FS1, FS2, RHO ( IK ) )
      CALL PARTEQ ( 1, FS1, FS2, TEMP ( IK ) )

```

```

CALL PARTEQ(2,FS1,FS2,F(IKHC))
CALL PARTEQ(3,FS1,FS2,F(IKO2))
CALL PARTEQ(4,FS1,FS2,F(IKCO))
CALL PARTEQ(5,FS1,FS2,F(IKCO2))
CALL PARTEQ(6,FS1,FS2,F(IKH2O))
CALL PARTEQ(7,FS1,FS2,FDOT(IK))
F(IKN2)=(1.-FS1)*0.79114
IF(FII(IK).GE.2.) THEN
RHOIK=1.1716-FS1*(1.1716-6.5155E-01)
RHO(IK)=RHOIK+(RHO(IK)-RHOIK)*FLLL(IK)
TEMPIK=300+FS1*(300.-300.)
TEMP(IK)=TEMPIK+(TEMP(IK)-TEMPIK)*FLLL(IK)
FIKO2=(1-FS1)*0.20886
F(IKO2)=FIKO2+(F(IKO2)-FIKO2)*FLLL(IK)
FIKHC=FS1
F(IKHC)=FIKHC+(F(IKHC)-FIKHC)*FLLL(IK)
FIKN2=(1-FS1)*0.79114
F(IKN2)=FIKN2+(F(IKN2)-FIKN2)*FLLL(IK)
FIKCO=0.
F(IKCO)=FIKCO+(F(IKCO)-FIKCO)*FLLL(IK)
FIKCO2=0.
F(IKCO2)=FIKCO2+(F(IKCO2)-FIKCO2)*FLLL(IK)
FIKH2O=0.
F(IKH2O)=FIKH2O+(F(IKH2O)-FIKH2O)*FLLL(IK)
CSUMN=F(IKCO)+F(IKCO2)+F(IKHC)+F(IKH2O)+F(IKO2)+F(IKN2)+1.E-10
CFCO=F(IKCO)/CSUMN
CFCO2=F(IKCO2)/CSUMN
CFHC=F(IKHC)/CSUMN
CFH2O=F(IKH2O)/CSUMN
CFO2=F(IKO2)/CSUMN
CFN2=F(IKN2)/CSUMN
ENDIF

```

C-----

```

C      IF(FII(IK).LT.1.) THEN
C      CALL PARTEQ(0,FS1,FS2,RHO(IK))
C      CALL PARTEQ(1,FS1,FS2,TEMP(IK))
C      CALL PARTEQ(2,FS1,FS2,F(IKHC))
C      CALL PARTEQ(3,FS1,FS2,F(IKO2))
C      CALL PARTEQ(4,FS1,FS2,F(IKCO))
C      CALL PARTEQ(5,FS1,FS2,F(IKCO2))
C      CALL PARTEQ(6,FS1,FS2,F(IKH2O))
C      CALL PARTEQ(7,FS1,FS2,FDOT(IK))
C      F(IKN2)=(1.-FS1)*0.79114
C      ELSE
C      RHO(IK)=1.1716-FS1*(1.1716-6.5155E-01)
C      TEMP(IK)=300+FS1*(300.-300.)
C      F(IKO2)=(1-FS1)*0.20886
C      F(IKHC)=FS1
C      F(IKN2)=(1-FS1)*0.79114
C      CSUMN=F(IKO2)+F(IKHC)+F(IKN2)
C      F(IKO2)=F(IKO2)/CSUMN
C      F(IKHC)=F(IKHC)/CSUMN
C      F(IKN2)=F(IKN2)/CSUMN
C      F(IKCO)=0.
C      F(IKCO2)=0.
C      F(IKH2O)=0.
C      CSUMN=F(IKCO)+F(IKCO2)+F(IKHC)+F(IKH2O)+F(IKO2)+F(IKN2)+1.E-10
C      CFCO=F(IKCO)/CSUMN
C      CFCO2=F(IKCO2)/CSUMN
C      CFHC=F(IKHC)/CSUMN
C      CFH2O=F(IKH2O)/CSUMN
C      CFO2=F(IKO2)/CSUMN
C      CFN2=F(IKN2)/CSUMN
C      ENDIF

```

C-----

```

C      IF(I.EQ.39.AND.K.EQ.33) WRITE(17,61) FS1,TEMP(IK),FS2

```

```

C      IF(I.EQ.39.AND.K.EQ.37) WRITE(18,61) FS1,TEMP(IK),FS2
C      IF(I.EQ.39.AND.K.EQ.40) WRITE(19,61) FS1,TEMP(IK),FS2
C      IF(I.EQ.39.AND.K.EQ.42) WRITE(48,61) FS1,TEMP(IK),FS2
C      IF(I.EQ.39.AND.K.EQ.46) WRITE(49,61) FS1,TEMP(IK),FS2
C      IF(I.EQ.39.AND.K.EQ.49) WRITE(50,61) FS1,TEMP(IK),FS2
C-----
C      IF(I.EQ.60.AND.K.EQ.39) PRINT *,FS1,TEMP(IK),FS2,DSUM
C-----

      CSUMN=F(IKCO)+F(IKCO2)+F(IKHC)+F(IKH2O)+F(IKO2)+F(IKN2)+1.E-10
      CFCO=F(IKCO)/CSUMN
      CFCO2=F(IKCO2)/CSUMN
      CFHC=F(IKHC)/CSUMN
      CFH2O=F(IKH2O)/CSUMN
      CFO2=F(IKO2)/CSUMN
      CFN2=F(IKN2)/CSUMN

C
      IF(K.GE.45.AND.K.LE.46.AND.I.GE.17.AND.I.LE.33) THEN
      WRITE(17,61) FS1,TEMP(IK)
      WRITE(19,61) CFHC,CFCO
      END IF
      IF(K.GE.49.AND.K.LE.50.AND.I.GE.15.AND.I.LE.31) THEN
      WRITE(18,61) FS1,TEMP(IK)
      WRITE(19,61) CFHC,CFCO
      END IF

C
      TEMPE=TEMP(IK)
      CPCO=0.338-117.5/TEMPE+38200./TEMPE**2
      CPCO2=0.368-148.4/TEMPE+32000./TEMPE**2
      CPHC=0.114+4.53E-3*TEMPE-3.63E-7*TEMPE**2
C      CPH2=2.855+2.867E-4*TEMPE+9.92/TEMPE**0.5
      CPH2O=1.456+1.344E-4*TEMPE+2.36E-7*TEMPE**2
      CPO2=0.36-5.375/TEMPE**0.5+47.8/TEMPE
      CPN2=0.338-123.8/TEMPE+41400./TEMPE**2
      CPMIX=CFCO*CPCO+CFCO2*CPCO2+CFHC*CPHC+CFH2O*CPH2O+
      1CFO2*CPO2+CFN2*CPN2

C-----
      CTTT=(TEMPE/491.6)**1.5
      CMMIX=CFCO*0.1657*CTTT*(491.6+245.)/(TEMPE+245.)+
      1CFCO2*0.137*CTTT*(491.6+400.)/(TEMPE+400.)+
      1CFHC*0.218*CTTT*(491.6-30.)/(TEMPE-30.)+
      1CFH2O*0.329*CTTT*(491.6+30.9)/(TEMPE+30.9)+
      1CFO2*0.1919*CTTT*(491.6+250.)/(TEMPE+250.)+
      1CFN2*0.01663*CTTT*(491.6+192.)/(TEMPE+192.)
      VISMIXT(IK)=CMMIX*0.0001
      IF(VISMIXT(IK).LT.5.E-4) VISMIXT(IK)=5.E-4
      CKM=CFCO*0.01342*CTTT*(491.6+320.)/(TEMPE+320.)+
      1CFCO2*0.008407*CTTT*(491.6+320.)/(TEMPE+320.)+
      1CFHC*0.184*CTTT*(491.6+320.)/(TEMPE+320.)+
      1CFH2O*0.1415*CTTT*(491.6+320.)/(TEMPE+320.)+
      1CFO2*0.01419*CTTT*(491.6+320.)/(TEMPE+320.)+
      1CFN2*0.014*CTTT*(491.6+320.)/(TEMPE+320.)
      PRAD(IK)=0.25*CPMIX*CMMIX/(CKM+1.E-10)
      IF(PRAD(IK).LE.0.3) PRAD(IK)=0.3
      IF(PRAD(IK).GE.0.7) PRAD(IK)=0.7

C
      RHO(IK)=RELAX(NVRHO)*RHO(IK)+(1.-RELAX(NVRHO))*RHOLD
1010 CONTINUE
      RETURN
      END

C
      SUBROUTINE PARTEQ(KVA,XBA,YBA,VA)
      COMMON/CBEQUI/YTEQ(41,41,6),FDQ2(41,41),RHOG(41,41),
      1FS(41),ZS(41),NFS,NZS
      COMMON/CBFUEL/AA,BB,RHOAIR,TEMPAD,OXYG1
      DIMENSION FINT(41,41)

```


C

```

      VA=0.0
      IF(XBA.LE.0.0) GO TO 1005
      XBAR=XBA+YBA/BB
      YBAR=YBA/(AA*XBA)
      GO TO 1006
1005  XBAR=0.0
      YBAR=0.0
1006  CONTINUE
      IF(YBAR.LT.ZS(1)) YBAR=ZS(1)
      DO 1007 J=2,NZS
      JJ=J
      IF(YBAR.LE.ZS(J)) GO TO 1008
1007  CONTINUE
      YBAR=ZS(NZS)
1008  CONTINUE
      IF(XBAR.LT.FS(1)) XBAR=FS(1)
      DO 1010 I=2,NFS
      II=I
      IF(XBAR.LE.FS(I)) GO TO 1011
1010  CONTINUE
      XBAR=FS(NFS)
1011  FAC=(YBAR-ZS(JJ-1))/(ZS(JJ)-ZS(JJ-1))
      DO 1015 I=1,NFS
      DO 1015 J=1,NZS
      IF(KVA.EQ.7) GO TO 1014
      IF(FS(I).EQ.0.0) GO TO 1013
      IF(KVA.EQ.0) FINT(I,J)=RHOG(I,J)
      IF(KVA.EQ.1) FINT(I,J)=YTEQ(I,J,KVA)
      IF(KVA.GT.1.AND.KVA.LT.7) FINT(I,J)=YTEQ(I,J,KVA)
      GO TO 1015
1013  IF(KVA.EQ.0) FINT(I,J)=RHOAIR
      IF(KVA.EQ.1) FINT(I,J)=TEMPAD
      IF(KVA.EQ.3) FINT(I,J)=OXYG1
      IF(KVA.EQ.2.OR.KVA.GT.3) FINT(I,J)=0.0
      GO TO 1015
1014  FINT(I,J)=FDCO2(I,J)
1015  CONTINUE
      XJ1=FINT(II-1,JJ-1)+FAC*(FINT(II-1,JJ)-FINT(II-1,JJ-1))
      XJ=FINT(II,JJ-1)+FAC*(FINT(II,JJ)-FINT(II,JJ-1))
      VA=XJ1+((XBAR-FS(II-1))/(FS(II)-FS(II-1)))*(XJ-XJ1)
      RETURN
      END

```

C

```

SUBROUTINE TEST(IC,F,GAM)
PARAMETER(NX=59,NY=59,NS=59,NXYZ=3481)
DIMENSION F(17*NXYZ),GAM(NXYZ),P(NXYZ),RHO(NXYZ)
DIMENSION U(NXYZ),V(NXYZ),W(NXYZ),DP(NXYZ),Q(NXYZ),
1D(NXYZ),TEMP(NXYZ),PSI(NXYZ)
COMMON/CBCOEF/AN(NXYZ),AS(NXYZ),AR(NXYZ),AL(NXYZ),
1SP(NXYZ),SU(NXYZ),QU(NXYZ),QV(NXYZ)
COMMON/GENRAL/R(NY),X(NX),Y(NY),RELAX(20),RESID(20),
1TITLE(6,20),PR(20),PRT(20)
COMMON/CBLK1/ICYCL(20),IPRINT(20),KO(NX),NFO(20),
1NVORDR(20)
COMMON/CBLK2/ISTEP,KRAD,KTIM,IMAX,KMAX,L,LP1,N,NP1,
1ISTR,KSTR,ISKIP,KSKIP,NSKIP,IDMX,KDMX,IKREF,IBURN,
1ITEST,ISTOP,LSTEP,NCYCL,NF,NV,NVU,NVV,NVW,NVDP,NVK,NVD,NVF,NVFF,
1INVNO,NVT,NVP,NVRHO,NVCO,NVCO2,NVHC,NVH2,NVH2O,NVO2,NVN2,NMAX
COMMON/CBLK3/DMAX,DSUM,DTIM,FLOIN,FLOUT1,FLOUT2,PRESS,TIM,TLAST,
1F1A,F2A,ATOT1,ATOT2,FLOC,FLOINFU
COMMON/CGRID/DY(NY),DX(NX),RDIFY(NY),RDIFYV(NY),
1DIFX(NX),DIFXU(NX),RM(NY),YV(NY),XU(NX)
COMMON/CTURB/AK,CD1,CD2,CM,CD,EWALL,RED

```

```
COMMON/CPROP/CP, GASCON, RHOREF, VISCO, WAIR
DATA ANL, ASL, ARL, ALL, SUL/2HAN, 2HAS, 2HAR, 2HAL, 2HSU/
DATA SPL, GML/2HSP, 4HGAMA/
DATA ZERO/1.E-10/
```

C

```
GO TO (1000,2000,3000), IC
```

C

```
1000 WRITE(6,1500) NV, ISTEP
      KSTR1=KSTR-1
      ISTR1=ISTR-1
      I11=2
      IEND=LP1-ISTR1
      KLAST=N
      DO 1020 ID=1,7
      K1=KSTR
      GO TO (100,102,104,106,108,110,112), ID
100  WRITE(6,1504) ANL
      GO TO 1010
102  WRITE(6,1504) ASL
      GO TO 1010
104  WRITE(6,1504) ARL
      GO TO 1010
106  WRITE (6,1504)ALL
      GO TO 1010
108  WRITE(6,1504) SUL
      GO TO 1010
110  WRITE(6,1504) SPL
      GO TO 1010
112  K1=KSTR1
      WRITE(6,1510) (TITLE(I,NV), I=1,6)
      I11=1
      IEND=LP1+1-ISTR1
      KLAST=NP1
1010 KL=MINO(K1+9, KLAST)
      WRITE (6,1506) (K, K=K1, KL)
      DO 1015 II=I11, IEND
      I=LP1-II+1
      KSTART=I+KO(K1)
      KEND=I+KO(KL)
      KSKIPO=KO(2)
      GO TO (120,122,124,126,128,130,132), ID
120  WRITE(6,1508) I, (AN(K), K=KSTART, KEND, KSKIPO)
      GO TO 1015
122  WRITE(6,1508) I, (AS(K), K=KSTART, KEND, KSKIPO)
      GO TO 1015
124  WRITE(6,1508) I, (AR(K), K=KSTART, KEND, KSKIPO)
      GO TO 1015
126  WRITE(6,1508) I, (AL(K), K=KSTART, KEND, KSKIPO)
128  WRITE(6,1508) I, (SU(K), K=KSTART, KEND, KSKIPO)
      GO TO 1015
130  WRITE(6,1508) I, (SP(K), K=KSTART, KEND, KSKIPO)
132  KSTART=KSTART+NFO(NV)
      KEND=KEND+NFO(NV)
      WRITE (6,1508) I, (F(K), K=KSTART, KEND, KSKIPO)
1015 CONTINUE
      IF(KL.EQ.KLAST) GO TO 1020
      K1=KL+1
      GO TO 1010
1020 CONTINUE
1500 FORMAT(14H1 VARIABLE NV=, I3, 5X, 6HISTEP=, I5)
1504 FORMAT(/28(2H*-), 5X, A4, 5X, 28(2H*-))
1506 FORMAT(4H0 I=, I7, 9I11)
1508 FORMAT(1X, I2, 2X, 1P11E11.3)
1510 FORMAT(/23(2H*-), 5X, 6A4, 5X, 23(2H*-))
      RETURN
```

C

```

2000 CONTINUE
CALCULATE MAXIMUM RESIDUE
  FMAX=-1.E20
  FMIN=1.E20
  RESID(NV)=0.
  DO 2100 I=ISTR,L
  DO 2100 K=KSTR,N
  IK=I+NFO(NV)
  IKP=IK+KO(K)
  IKN=IKP+1
  IKS=IKP-1
  IKR=IKP+KO(2)
  IKL=IKP-KO(2)
  IK=IKP-NFO(NV)
  FMIN=AMIN1(FMIN,F(IKP))
  FMAX=AMAX1(FMAX,F(IKP))
  IF(ABS(SP(IK)).LT.ZERO) SP(IK)=0.0
  IF(ABS(SU(IK)).LT.ZERO) SU(IK)=0.0
  IF(ABS(AN(IK)).LT.ZERO) AN(IK)=0.0
  IF(ABS(AS(IK)).LT.ZERO) AS(IK)=0.0
  IF(ABS(AR(IK)).LT.ZERO) AR(IK)=0.0
  IF(ABS(AL(IK)).LT.ZERO) AL(IK)=0.0
  IF(ABS(F(IKP)).LT.ZERO) F(IKP)=0.0
  IF(ABS(F(IKN)).LT.ZERO) F(IKN)=0.0
  IF(ABS(F(IKS)).LT.ZERO) F(IKS)=0.0
  IF(ABS(F(IKR)).LT.ZERO) F(IKR)=0.0
  IF(ABS(F(IKL)).LT.ZERO) F(IKL)=0.0
  IF(NV.EQ.NVDP) GO TO 2050
C   IF(NV.EQ.NVD) PRINT *,'1'
   IF(ABS(F(IKN)).LE.1.E-20) GOTO 2101
   IF(ABS(F(IKR)).LE.1.E-20) GOTO 2101
   IF(ABS(F(IKL)).LE.1.E-20) GOTO 2101
   IF(ABS(F(IKP)).LE.1.E-20) GOTO 2101
   IF(ABS(SU(IK)).LE.1.E-20) GOTO 2101
   IF(ABS(SP(IK)).LE.1.E-10) GOTO 2101
   IF(ABS(F(IKN)).LE.1.E-20) GOTO 2101
   RES=(AN(IK)*F(IKN)+AS(IK)*F(IKS)+AR(IK)*F(IKR)+
1     AL(IK)*F(IKL)+SU(IK))/SP(IK)-F(IKP)
C   IF(NV.EQ.NVD) PRINT *,'2'
   GOTO 2102
2101 RES=0.0
2102 CONTINUE
   GO TO 2100
C   PRINT *,'3'
2050 RES=(AN(IK)*F(IKN)+AS(IK)*F(IKS)+AR(IK)*F(IKR)+
1     IAL(IK)*F(IKL)+SU(IK))/RELAX(NV)-SP(IK)*F(IKP)
C   PRINT *,'4'
   IF(ABS(RES).LT.ZERO) RES=0.0
2100 RESID(NV)=AMAX1(RESID(NV),ABS(RES))
C   PRINT *,'5'
   IF(NV.NE.NVDP) RESID(NV)=RESID(NV)/(FMAX-FMIN+1.E-10)
C   PRINT *,'6'
   RETURN
C
3000 CONTINUE
  WRITE(6,1500) NV,ISTEP
  DO 3025 ID=1,2
  IF(ID.NE.1) GO TO 3005
  WRITE(6,1504) SUL
  GO TO 3006
3005 WRITE(6,1504) SPL
3006 CONTINUE
  K1=KSTR
  IEND=LP1+1-ISTR
3010 KL=MIN0(K1+9,N)
  WRITE(6,1506) (K,K=K1,KL)

```

```
DO 3020 II=2, IEND
I=LP1-II+1
KSTART=I+KO(K1)
KEND=I+KO(KL)
IF(ID.NE.1) GO TO 3015
WRITE(6,1508) I, (SU(K), K=KSTART, KEND, KSKIPO)
GO TO 3020
3015 WRITE (6,1508) I, (SP(K), K=KSTART, KEND, KSKIPO)
3020 CONTINUE
IF(KL.EQ.N) GO TO 3025
K1=KL+1
GO TO 3010
3025 CONTINUE
WRITE (6,1504) GML
K1=1
3035 KL=MINO(K1+9, NP1)
WRITE(6,1506) (K, K=K1, KL)
DO 3040 II=1, LP1
I=LP1+1-II
KSTART=I+KO(K1)
KEND=I+KO(KL)
3040 WRITE(6,1508) I, (GAM(K), K=KSTART, KEND, KSKIPO)
IF(KL.EQ.NP1) GO TO 3045
K1=KL+1
GO TO 3035
3045 CONTINUE
RETURN
END
```

4. ΕΠΙΛΟΓΗ ΑΠΟΤΕΛΕΣΜΑΤΩΝ

0	1							
17	58	58	85					
0.00000	0.00010	0.00020	0.00040	0.00060	0.00080	0.00100	0.00120	0.00140
0.00150	0.00170	0.00190	0.00220	0.00260	0.00310	0.00370	0.00450	0.00550
0.00670	0.00800	0.00900	0.01000	0.01100	0.01200	0.01300	0.01400	0.01500
0.01600	0.01700	0.01800	0.01850	0.01950	0.02000	0.02200	0.02400	0.02600
0.02800	0.03000	0.03200	0.03400	0.03600	0.03800	0.04000	0.04200	0.04400
0.04600	0.04900	0.05200	0.05400	0.05600	0.05800	0.06000	0.06200	0.06400
0.06600	0.06800	0.07000	0.07200	0.07600				
0.00000	0.00010	0.00020	0.00030	0.00040	0.00050	0.00060	0.00070	0.00080
0.00090	0.00100	0.00110	0.00120	0.00130	0.00140	0.00150	0.00160	0.00170
0.00180	0.00190	0.00200	0.00220	0.00240	0.00260	0.00280	0.00300	0.00330
0.00360	0.00390	0.00420	0.00450	0.00480	0.00520	0.00560	0.00600	0.00650
0.00700	0.00750	0.00800	0.00850	0.00900	0.00950	0.01000	0.01500	0.02000
0.03000	0.04000	0.05500	0.06000	0.07500	0.08000	0.09500	0.11000	0.12500
0.13500	0.14500	0.15500	0.16500	0.17500				
0.00000	0.00000	0.00159	0.01905	0.07600	0.07600	0.17500		

58 1 1 10 32 59
2

0.100000E-020.100000E-020.101226E+00
0.200000E+020.100000E-020.178748E+020.178563E+02
0.177857E+020.101226E+00

3

0.200000E-020.100000E-020.917006E-01
0.400000E+020.200000E-020.182866E+020.182699E+02
0.179168E+020.917006E-01

4

0.300000E-020.100000E-020.686662E-01
0.600000E+020.300000E-020.181043E+020.180244E+02
0.177369E+020.686662E-01

5

0.400000E-020.100000E-020.605368E-01
0.800000E+020.400000E-020.173470E+020.173289E+02
0.175392E+020.605368E-01

6

0.500000E-020.100000E-020.259393E-01
0.100000E+030.500000E-020.182284E+020.182222E+02
0.180544E+020.259393E-01

7

0.600000E-020.100000E-020.232376E-01
0.120000E+030.600000E-020.183369E+020.183311E+02
0.180568E+020.232376E-01

8

0.700000E-020.100000E-020.142870E-01
0.140000E+030.700000E-020.177210E+020.177235E+02
0.177486E+020.142870E-01

9

0.800000E-020.100000E-020.128675E-01
0.160000E+030.800000E-020.179703E+020.179414E+02
0.178332E+020.128675E-01

10

0.900000E-020.100000E-020.567314E-02
0.180000E+030.900000E-020.180190E+020.180124E+02
0.179279E+020.567314E-02

11

0.100000E-010.100000E-020.520440E-02
0.200000E+030.100000E-010.180418E+020.180334E+02
0.179174E+020.520440E-02

12

0.110000E-010.100000E-020.349158E-02
0.220000E+030.110000E-010.179908E+020.179823E+02
0.178807E+020.349158E-02

13

0.120000E-010.100000E-020.354715E-02
0.240000E+030.120000E-010.179600E+020.179478E+02
0.178660E+020.354715E-02

14

0.130000E-010.100000E-020.166099E-02
0.260000E+030.130000E-010.179921E+020.179819E+02
0.178919E+020.166099E-02

15

0.140000E-010.100000E-020.208165E-02
0.280000E+030.140000E-010.180172E+020.180072E+02
0.179036E+020.208165E-02

16

0.150000E-010.100000E-020.893668E-03
0.300000E+030.150000E-010.179908E+020.179816E+02
0.178875E+020.893668E-03

17

0.160000E-010.100000E-020.122808E-02
0.320000E+030.160000E-010.179835E+020.179734E+02
0.178840E+020.122808E-02

18

0.170000E-010.100000E-020.777924E-03
0.340000E+030.170000E-010.179972E+020.179871E+02
0.178927E+020.777924E-03

19

0.180000E-010.100000E-020.760273E-03
0.360000E+030.180000E-010.179950E+020.179854E+02
0.178927E+020.760273E-03

20

0.190000E-010.100000E-020.568008E-03
0.380000E+030.190000E-010.179942E+020.179846E+02
0.178920E+020.568008E-03

21

0.200000E-010.100000E-020.110658E-02
0.400000E+030.200000E-010.179933E+020.179834E+02
0.178913E+020.110658E-02

22

0.210000E-010.100000E-020.924743E-03
0.420000E+030.210000E-010.179920E+020.179823E+02
0.178921E+020.924743E-03

23

0.220000E-010.100000E-020.811950E-03
0.440000E+030.220000E-010.179942E+020.179852E+02
0.178948E+020.811950E-03

24

0.230000E-010.100000E-020.927911E-03
0.460000E+030.230000E-010.179957E+020.179864E+02
0.178953E+020.927911E-03

25

0.240000E-010.100000E-020.104258E-02
0.480000E+030.240000E-010.179926E+020.179833E+02
0.178940E+020.104258E-02

26

0.250000E-010.100000E-020.919756E-03
0.500000E+030.250000E-010.179923E+020.179830E+02
0.178952E+020.919756E-03

27

0.260000E-010.100000E-020.140787E-02

0.520000E+030.260000E-010.179951E+020.179858E+02
0.178972E+020.140787E-02
28
0.270000E-010.100000E-020.192649E-02
0.540000E+030.270000E-010.179950E+020.179856E+02
0.178976E+020.192649E-02
29
0.280000E-010.100000E-020.671305E-03
0.560000E+030.280000E-010.179941E+020.179852E+02
0.178987E+020.671305E-03
30
0.290000E-010.100000E-020.891491E-03
0.580000E+030.290000E-010.179957E+020.179872E+02
0.179004E+020.891491E-03
31
0.300000E-010.100000E-020.559172E-03
0.600000E+030.300000E-010.179927E+020.179838E+02
0.178982E+020.559172E-03
32
0.310000E-010.100000E-020.116904E-02
0.620000E+030.310000E-010.179919E+020.179825E+02
0.178981E+020.116904E-02
33
0.320000E-010.100000E-020.167776E-02
0.640000E+030.320000E-010.179951E+020.179855E+02
0.179003E+020.167776E-02
34
0.330000E-010.100000E-020.127377E-02
0.660000E+030.330000E-010.179951E+020.179864E+02
0.179026E+020.127377E-02
35
0.340000E-010.100000E-020.236797E-02
0.680000E+030.340000E-010.179945E+020.179864E+02
0.179039E+020.236797E-02
36
0.350000E-010.100000E-020.136134E-02
0.700000E+030.350000E-010.179940E+020.179853E+02
0.179030E+020.136134E-02
37
0.360000E-010.100000E-020.223958E-02
0.720000E+030.360000E-010.179925E+020.179836E+02
0.179028E+020.223958E-02
38
0.370000E-010.100000E-020.157601E-02
0.740000E+030.370000E-010.179946E+020.179857E+02
0.179046E+020.157601E-02
39
0.380000E-010.100000E-020.819622E-03
0.760000E+030.380000E-010.179952E+020.179863E+02
0.179051E+020.819622E-03
40
0.390000E-010.100000E-020.766649E-03
0.780000E+030.390000E-010.179939E+020.179854E+02
0.179055E+020.766649E-03
41
0.400000E-010.100000E-020.725607E-03
0.800000E+030.400000E-010.179946E+020.179863E+02
0.179065E+020.725607E-03
42
0.410000E-010.100000E-020.224167E-02
0.820000E+030.410000E-010.179963E+020.179882E+02
0.179081E+020.224167E-02
43
0.420000E-010.100000E-020.374591E-02
0.840000E+030.420000E-010.179934E+020.179872E+02
0.179104E+020.374591E-02

44

0.430000E-010.100000E-020.139346E-02
0.860000E+030.430000E-010.179932E+020.179863E+02
0.179097E+020.139346E-02

45

0.440000E-010.100000E-020.243043E-02
0.880000E+030.440000E-010.179923E+020.179838E+02
0.179078E+020.243043E-02

46

0.450000E-010.100000E-020.246967E-02
0.900000E+030.450000E-010.179949E+020.179854E+02
0.179093E+020.246967E-02

47

0.460000E-010.100000E-020.115823E-02
0.920000E+030.460000E-010.179961E+020.179873E+02
0.179108E+020.115823E-02

48

0.470000E-010.100000E-020.108285E-02
0.940000E+030.470000E-010.179953E+020.179871E+02
0.179111E+020.108285E-02

49

0.480000E-010.100000E-020.975336E-03
0.960000E+030.480000E-010.179928E+020.179853E+02
0.179113E+020.975336E-03

50

0.490000E-010.100000E-020.213239E-02
0.980000E+030.490000E-010.179952E+020.179882E+02
0.179137E+020.213239E-02

51

0.500000E-010.100000E-020.977233E-03
0.100000E+040.500000E-010.179952E+020.179882E+02
0.179144E+020.977233E-03

52

0.510000E-010.100000E-020.157822E-02
0.102000E+040.510000E-010.179931E+020.179851E+02
0.179127E+020.157822E-02

53

0.520000E-010.100000E-020.111927E-02
0.104000E+040.520000E-010.179933E+020.179847E+02
0.179129E+020.111927E-02

54

0.530000E-010.100000E-020.587770E-03
0.106000E+040.530000E-010.179953E+020.179874E+02
0.179154E+020.587770E-03

55

0.540000E-010.100000E-020.103607E-02
0.108000E+040.540000E-010.179963E+020.179890E+02
0.179170E+020.103607E-02

56

0.550000E-010.100000E-020.881700E-03
0.110000E+040.550000E-010.179946E+020.179874E+02
0.179161E+020.881700E-03

57

0.560000E-010.100000E-020.836688E-03
0.112000E+040.560000E-010.179928E+020.179855E+02
0.179160E+020.836688E-03

58

0.570000E-010.100000E-020.189974E-02
0.114000E+040.570000E-010.179948E+020.179881E+02
0.179181E+020.189974E-02

59

0.580000E-010.100000E-020.116570E-02
0.116000E+040.580000E-010.179951E+020.179882E+02
0.179178E+020.116570E-02

60

0.590000E-010.100000E-020.574802E-03

0.118000E+040.590000E-010.179936E+020.179864E+02
0.179173E+020.574802E-03

61

0.600000E-010.100000E-020.105379E-02
0.120000E+040.600000E-010.179940E+020.179866E+02
0.179182E+020.105379E-02

62

0.610000E-010.100000E-020.763973E-03
0.122000E+040.610000E-010.179958E+020.179883E+02
0.179197E+020.763973E-03

63

0.620000E-010.100000E-020.445778E-03
0.124000E+040.620000E-010.179954E+020.179883E+02
0.179197E+020.445778E-03

64

0.629999E-010.100000E-020.926722E-03
0.126000E+040.629999E-010.179940E+020.179870E+02
0.179194E+020.926722E-03

65

0.640000E-010.100000E-020.217272E-02
0.128000E+040.640000E-010.179949E+020.179881E+02
0.179207E+020.217272E-02

66

0.650000E-010.100000E-020.227917E-02
0.130000E+040.650000E-010.179951E+020.179884E+02
0.179214E+020.227917E-02

67

0.660000E-010.100000E-020.127670E-02
0.132000E+040.660000E-010.179939E+020.179875E+02
0.179217E+020.127670E-02

68

0.670000E-010.100000E-020.522604E-03
0.134000E+040.670000E-010.179952E+020.179885E+02
0.179222E+020.522604E-03

69

0.680000E-010.100000E-020.908713E-03
0.136000E+040.680000E-010.179957E+020.179891E+02
0.179228E+020.908713E-03

70

0.690000E-010.100000E-020.229179E-02
0.138000E+040.690000E-010.179963E+020.179891E+02
0.179222E+020.229179E-02

71

0.700000E-010.100000E-020.168043E-02
0.140000E+040.700000E-010.179920E+020.179853E+02
0.179204E+020.168043E-02

72

0.710000E-010.100000E-020.922372E-03
0.142000E+040.710000E-010.179938E+020.179871E+02
0.179222E+020.922372E-03

73

0.720000E-010.100000E-020.109799E-02
0.144000E+040.720000E-010.179968E+020.179904E+02
0.179247E+020.109799E-02

74

0.730000E-010.100000E-020.430564E-03
0.146000E+040.730000E-010.179964E+020.179894E+02
0.179238E+020.430564E-03

75

0.740000E-010.100000E-020.470078E-03
0.148000E+040.740000E-010.179932E+020.179864E+02
0.179221E+020.470078E-03

76

0.750000E-010.100000E-020.478706E-03
0.150000E+040.750000E-010.179952E+020.179881E+02
0.179231E+020.478706E-03

77

0.760000E-010.100000E-020.437532E-03
0.152000E+040.760000E-010.179947E+020.179881E+02
0.179237E+020.437532E-03

78

0.770000E-010.100000E-020.462688E-03
0.154000E+040.770000E-010.179957E+020.179892E+02
0.179245E+020.462688E-03

79

0.780000E-010.100000E-020.563182E-03
0.156000E+040.780000E-010.179955E+020.179888E+02
0.179244E+020.563182E-03

80

0.790000E-010.100000E-020.850134E-03
0.158000E+040.790000E-010.179943E+020.179871E+02
0.179235E+020.850134E-03

81

0.800000E-010.100000E-020.469001E-03
0.160000E+040.800000E-010.179941E+020.179869E+02
0.179239E+020.469001E-03

82

0.810000E-010.100000E-020.394987E-03
0.162000E+040.810000E-010.179965E+020.179893E+02
0.179254E+020.394987E-03

83

0.820000E-010.100000E-020.333676E-03
0.164000E+040.820000E-010.179960E+020.179892E+02
0.179257E+020.333676E-03

84

0.830000E-010.100000E-020.257713E-03
0.166000E+040.830000E-010.179950E+020.179881E+02
0.179252E+020.257713E-03

85

0.840000E-010.100000E-020.264949E-03
0.168000E+040.840000E-010.179939E+020.179871E+02
0.179250E+020.264949E-03

86

0.850000E-010.100000E-020.200111E-03
0.170000E+040.850000E-010.179957E+020.179889E+02
0.179264E+020.200111E-03

87

0.860000E-010.100000E-020.312366E-03
0.172000E+040.860000E-010.179962E+020.179894E+02
0.179267E+020.312366E-03

88

0.870000E-010.100000E-020.618833E-03
0.174000E+040.870000E-010.179940E+020.179878E+02
0.179268E+020.618833E-03

89

0.880000E-010.100000E-020.937297E-03
0.176000E+040.880000E-010.179966E+020.179901E+02
0.179281E+020.937297E-03

90

0.890000E-010.100000E-020.871336E-03
0.178000E+040.890000E-010.179954E+020.179887E+02
0.179275E+020.871336E-03

91

0.900000E-010.100000E-020.104977E-02
0.180000E+040.900000E-010.179953E+020.179886E+02
0.179272E+020.104977E-02

92

0.910000E-010.100000E-020.676272E-03
0.182000E+040.910000E-010.179937E+020.179871E+02
0.179265E+020.676272E-03

93

0.920000E-010.100000E-020.848059E-03

0.184000E+040.920000E-010.179966E+020.179898E+02
0.179284E+020.848059E-03
94
0.930000E-010.100000E-020.414286E-03
0.186000E+040.930000E-010.179964E+020.179895E+02
0.179278E+020.414286E-03
95
0.940000E-010.100000E-020.328956E-03
0.188000E+040.940000E-010.179946E+020.179877E+02
0.179269E+020.328956E-03
96
0.950000E-010.100000E-020.379851E-03
0.190000E+040.950000E-010.179952E+020.179887E+02
0.179276E+020.379851E-03
97
0.960000E-010.100000E-020.240648E-03
0.192000E+040.960000E-010.179962E+020.179896E+02
0.179282E+020.240648E-03
98
0.970000E-010.100000E-020.172162E-02
0.194000E+040.970000E-010.179951E+020.179887E+02
0.179276E+020.172162E-02
99
0.980000E-010.100000E-020.116285E-02
0.196000E+040.980000E-010.179943E+020.179876E+02
0.179273E+020.116285E-02
100
0.990000E-010.100000E-020.131297E-02
0.198000E+040.990000E-010.179956E+020.179895E+02
0.179293E+020.131297E-02
101
0.100000E+000.100000E-020.111943E-02
0.200000E+040.100000E+000.179959E+020.179899E+02
0.179302E+020.111943E-02
102
0.101000E+000.100000E-020.290629E-03
0.202000E+040.101000E+000.179959E+020.179892E+02
0.179293E+020.290629E-03
103
0.102000E+000.100000E-020.163673E-02
0.204000E+040.102000E+000.179966E+020.179898E+02
0.179293E+020.163673E-02
104
0.103000E+000.100000E-020.993234E-03
0.206000E+040.103000E+000.179942E+020.179875E+02
0.179276E+020.993234E-03
105
0.104000E+000.100000E-020.502762E-03
0.208000E+040.104000E+000.179948E+020.179888E+02
0.179291E+020.502762E-03
106
0.105000E+000.100000E-020.464264E-03
0.210000E+040.105000E+000.179958E+020.179897E+02
0.179300E+020.464264E-03
107
0.106000E+000.100000E-020.504106E-03
0.212000E+040.106000E+000.179966E+020.179903E+02
0.179304E+020.504106E-03
108
0.107000E+000.100000E-020.352526E-03
0.214000E+040.107000E+000.179941E+020.179878E+02
0.179286E+020.352526E-03
109
0.108000E+000.100000E-020.359154E-03
0.216000E+040.108000E+000.179943E+020.179882E+02
0.179297E+020.359154E-03

110
0.109000E+000.100000E-020.987986E-03
0.218000E+040.109000E+000.179983E+020.179920E+02
0.179313E+020.987986E-03
111
0.110000E+000.100000E-020.452775E-03
0.220000E+040.110000E+000.179954E+020.179888E+02
0.179290E+020.452775E-03
112
0.111000E+000.100000E-020.388990E-03
0.222000E+040.111000E+000.179927E+020.179864E+02
0.179278E+020.388990E-03
113
0.112000E+000.100000E-020.215155E-03
0.224000E+040.112000E+000.179959E+020.179895E+02
0.179297E+020.215155E-03
114
0.113000E+000.100000E-020.257466E-03
0.226000E+040.113000E+000.179971E+020.179906E+02
0.179301E+020.257466E-03
115
0.114000E+000.100000E-020.420667E-03
0.228000E+040.114000E+000.179944E+020.179879E+02
0.179286E+020.420667E-03
116
0.115000E+000.100000E-020.249649E-03
0.230000E+040.115000E+000.179953E+020.179887E+02
0.179292E+020.249649E-03
117
0.116000E+000.100000E-020.221603E-03
0.232000E+040.116000E+000.179957E+020.179892E+02
0.179293E+020.221603E-03
118
0.117000E+000.100000E-020.317349E-03
0.234000E+040.117000E+000.179950E+020.179885E+02
0.179293E+020.317349E-03
119
0.118000E+000.100000E-020.249331E-03
0.236000E+040.118000E+000.179967E+020.179901E+02
0.179303E+020.249331E-03
120
0.119000E+000.100000E-020.373368E-03
0.238000E+040.119000E+000.179968E+020.179901E+02
0.179299E+020.373368E-03
121
0.120000E+000.100000E-020.267860E-03
0.240000E+040.120000E+000.179936E+020.179872E+02
0.179286E+020.267860E-03
122
0.121000E+000.100000E-020.129647E-03
0.242000E+040.121000E+000.179957E+020.179892E+02
0.179299E+020.129647E-03
123
0.122000E+000.100000E-020.220582E-03
0.244000E+040.122000E+000.179963E+020.179901E+02
0.179305E+020.220582E-03
124
0.123000E+000.100000E-020.193069E-03
0.246000E+040.123000E+000.179958E+020.179894E+02
0.179301E+020.193069E-03
125
0.124000E+000.100000E-020.221976E-03
0.248000E+040.124000E+000.179953E+020.179888E+02
0.179297E+020.221976E-03
126
0.125000E+000.100000E-020.141062E-03

0.250000E+040.125000E+000.179950E+020.179886E+02
0.179296E+020.141062E-03
127
0.126000E+000.100000E-020.158349E-03
0.252000E+040.126000E+000.179962E+020.179898E+02
0.179305E+020.158349E-03
128
0.127000E+000.100000E-020.265308E-03
0.254000E+040.127000E+000.179967E+020.179900E+02
0.179301E+020.265308E-03
129
0.128000E+000.100000E-020.193054E-03
0.256000E+040.128000E+000.179942E+020.179879E+02
0.179291E+020.193054E-03
130
0.129000E+000.100000E-020.247007E-03
0.258000E+040.129000E+000.179957E+020.179893E+02
0.179300E+020.247007E-03
131
0.130000E+000.100000E-020.229798E-03
0.260000E+040.130000E+000.179956E+020.179893E+02
0.179303E+020.229798E-03
132
0.131000E+000.100000E-020.159231E-03
0.262000E+040.131000E+000.179960E+020.179898E+02
0.179308E+020.159231E-03
133
0.132000E+000.100000E-020.192351E-03
0.264000E+040.132000E+000.179957E+020.179894E+02
0.179305E+020.192351E-03
134
0.133000E+000.100000E-020.249156E-03
0.266000E+040.133000E+000.179955E+020.179890E+02
0.179305E+020.249156E-03
135
0.134000E+000.100000E-020.256375E-03
0.268000E+040.134000E+000.179953E+020.179889E+02
0.179303E+020.256375E-03
136
0.135000E+000.100000E-020.328422E-03
0.270000E+040.135000E+000.179960E+020.179899E+02
0.179312E+020.328422E-03
137
0.136000E+000.100000E-020.249512E-03
0.272000E+040.136000E+000.179961E+020.179897E+02
0.179311E+020.249512E-03
138
0.137000E+000.100000E-020.300129E-03
0.274000E+040.137000E+000.179949E+020.179884E+02
0.179306E+020.300129E-03
139
0.138000E+000.100000E-020.521536E-03
0.276000E+040.138000E+000.179940E+020.179882E+02
0.179311E+020.521536E-03
140
0.139000E+000.100000E-020.376495E-03
0.278000E+040.139000E+000.179977E+020.179915E+02
0.179330E+020.376495E-03
141
0.140000E+000.100000E-020.338585E-03
0.280000E+040.140000E+000.179965E+020.179902E+02
0.179319E+020.338585E-03
142
0.141000E+000.100000E-020.283807E-03
0.282000E+040.141000E+000.179945E+020.179881E+02
0.179303E+020.283807E-03

143
0.142000E+000.100000E-020.282961E-03
0.284000E+040.142000E+000.179939E+020.179877E+02
0.179306E+020.282961E-03
144
0.143000E+000.100000E-020.305177E-03
0.286000E+040.143000E+000.179969E+020.179907E+02
0.179323E+020.305177E-03
145
0.144000E+000.100000E-020.292730E-03
0.288000E+040.144000E+000.179962E+020.179902E+02
0.179319E+020.292730E-03
146
0.145000E+000.100000E-020.129107E-02
0.290000E+040.145000E+000.179956E+020.179892E+02
0.179313E+020.129107E-02
147
0.146000E+000.100000E-020.112244E-02
0.292000E+040.146000E+000.179957E+020.179886E+02
0.179303E+020.112244E-02
148
0.147000E+000.100000E-020.468269E-03
0.294000E+040.147000E+000.179948E+020.179886E+02
0.179304E+020.468269E-03
149
0.148000E+000.100000E-020.427695E-03
0.296000E+040.148000E+000.179955E+020.179895E+02
0.179316E+020.427695E-03
150
0.149000E+000.100000E-020.264020E-03
0.298000E+040.149000E+000.179970E+020.179907E+02
0.179321E+020.264020E-03
151
0.150000E+000.100000E-020.187927E-03
0.300000E+040.150000E+000.179950E+020.179887E+02
0.179310E+020.187927E-03
152
0.151000E+000.100000E-020.211317E-03
0.302000E+040.151000E+000.179951E+020.179888E+02
0.179311E+020.211317E-03
153
0.152000E+000.100000E-020.174000E-03
0.304000E+040.152000E+000.179963E+020.179901E+02
0.179318E+020.174000E-03
154
0.153000E+000.100000E-020.171851E-03
0.306000E+040.153000E+000.179954E+020.179892E+02
0.179312E+020.171851E-03
155
0.154000E+000.100000E-020.157037E-03
0.308000E+040.154000E+000.179954E+020.179891E+02
0.179313E+020.157037E-03
156
0.155000E+000.100000E-020.164085E-03
0.310000E+040.155000E+000.179957E+020.179895E+02
0.179315E+020.164085E-03
157
0.156000E+000.100000E-020.235443E-03
0.312000E+040.156000E+000.179960E+020.179897E+02
0.179317E+020.235443E-03
158
0.157000E+000.100000E-020.194213E-03
0.314000E+040.157000E+000.179951E+020.179888E+02
0.179312E+020.194213E-03
159
0.158000E+000.100000E-020.171354E-03

0.316000E+040.158000E+000.179958E+020.179894E+02
0.179316E+020.171354E-03
160
0.159000E+000.100000E-020.167141E-03
0.318000E+040.159000E+000.179964E+020.179901E+02
0.179318E+020.167141E-03
161
0.160000E+000.100000E-020.148606E-03
0.320000E+040.160000E+000.179952E+020.179888E+02
0.179311E+020.148606E-03
162
0.161000E+000.100000E-020.105972E-03
0.322000E+040.161000E+000.179953E+020.179891E+02
0.179313E+020.105972E-03
163
0.162000E+000.100000E-020.180339E-03
0.324000E+040.162000E+000.179958E+020.179896E+02
0.179316E+020.180339E-03
164
0.163000E+000.100000E-020.206079E-03
0.326000E+040.163000E+000.179957E+020.179896E+02
0.179319E+020.206079E-03
165
0.164000E+000.100000E-020.186378E-03
0.328000E+040.164000E+000.179961E+020.179897E+02
0.179316E+020.186378E-03
166
0.165000E+000.100000E-020.151362E-03
0.330000E+040.165000E+000.179952E+020.179889E+02
0.179313E+020.151362E-03
167
0.166000E+000.100000E-020.996606E-04
0.332000E+040.166000E+000.179956E+020.179893E+02
0.179315E+020.996606E-04
168
0.167000E+000.100000E-020.195437E-03
0.334000E+040.167000E+000.179960E+020.179898E+C2
0.179319E+020.195437E-03
169
0.168000E+000.100000E-020.133979E-03
0.336000E+040.168000E+000.179953E+020.179892E+02
0.179316E+020.133979E-03
170
0.169000E+000.100000E-020.759152E-04
0.338000E+040.169000E+000.179959E+020.179896E+02
0.179317E+020.759152E-04
171
0.170000E+000.100000E-020.930428E-04
0.340000E+040.170000E+000.179954E+020.179892E+02
0.179316E+020.930428E-04
172
0.171000E+000.100000E-020.193965E-03
0.342000E+040.171000E+000.179961E+020.179897E+02
0.179317E+020.193965E-03
173
0.172000E+000.100000E-020.118336E-03
0.344000E+040.172000E+000.179952E+020.179890E+02
0.179313E+020.118336E-03
174
0.173000E+000.100000E-020.197574E-03
0.346000E+040.173000E+000.179951E+020.179890E+02
0.179314E+020.197574E-03
175
0.174000E+000.100000E-020.239241E-03
0.348000E+040.174000E+000.179962E+020.179900E+02
0.179321E+020.239241E-03

176
0.175000E+000.100000E-020.252040E-03
0.350000E+040.175000E+000.179965E+020.179901E+02
0.179321E+020.252040E-03
177
0.176000E+000.100000E-020.329934E-03
0.352000E+040.176000E+000.179951E+020.179887E+02
0.179312E+020.329934E-03
178
0.177000E+000.100000E-020.286998E-03
0.354000E+040.177000E+000.179952E+020.179889E+02
0.179312E+020.286998E-03
179
0.178000E+000.100000E-020.223715E-03
0.356000E+040.178000E+000.179954E+020.179893E+02
0.179316E+020.223715E-03
180
0.179000E+000.100000E-020.207490E-03
0.358000E+040.179000E+000.179962E+020.179901E+02
0.179322E+020.207490E-03
181
0.180000E+000.100000E-020.268831E-03
0.360000E+040.180000E+000.179963E+020.179899E+02
0.179319E+020.268831E-03
182
0.181000E+000.100000E-020.291606E-03
0.362000E+040.181000E+000.179939E+020.179878E+02
0.179309E+020.291606E-03
183
0.182000E+000.100000E-020.252561E-03
0.364000E+040.182000E+000.179960E+020.179897E+02
0.179321E+020.252561E-03
184
0.183000E+000.100000E-020.260538E-03
0.366000E+040.183000E+000.179970E+020.179908E+02
0.179325E+020.260538E-03
185
0.184000E+000.100000E-020.391215E-03
0.368000E+040.184000E+000.179958E+020.179893E+02
0.179315E+020.391215E-03
186
0.185000E+000.100000E-020.325582E-03
0.370000E+040.185000E+000.179941E+020.179879E+02
0.179307E+020.325582E-03
187
0.186000E+000.100000E-020.311263E-03
0.372000E+040.186000E+000.179954E+020.179892E+02
0.179317E+020.311263E-03
188
0.187000E+000.100000E-020.310420E-03
0.374000E+040.187000E+000.179969E+020.179909E+02
0.179328E+020.310420E-03
189
0.188000E+000.100000E-020.253562E-03
0.376000E+040.188000E+000.179960E+020.179897E+02
0.179318E+020.253562E-03
190
0.189000E+000.100000E-020.482330E-03
0.378000E+040.189000E+000.179952E+020.179887E+02
0.179313E+020.482330E-03
191
0.190000E+000.100000E-020.329672E-03
0.380000E+040.190000E+000.179949E+020.179885E+02
0.179310E+020.329672E-03
192
0.191000E+000.100000E-020.273332E-03

0.382000E+040.191000E+000.179955E+020.179894E+02
0.179319E+020.273332E-03
193
0.192000E+000.100000E-020.294144E-03
0.384000E+040.192000E+000.179967E+020.179906E+02
0.179325E+020.294144E-03
194
0.193000E+000.100000E-020.233077E-03
0.386000E+040.193000E+000.179961E+020.179898E+02
0.179319E+020.233077E-03
195
0.194000E+000.100000E-020.301593E-03
0.388000E+040.194000E+000.179943E+020.179880E+02
0.179309E+020.301593E-03
196
0.195000E+000.100000E-020.203576E-03
0.390000E+040.195000E+000.179958E+020.179896E+02
0.179319E+020.203576E-03
197
0.196000E+000.100000E-020.308808E-03
0.392000E+040.196000E+000.179972E+020.179908E+02
0.179325E+020.308808E-03
198
0.197000E+000.100000E-020.313461E-03
0.394000E+040.197000E+000.179948E+020.179884E+02
0.179309E+020.313461E-03
199
0.198000E+000.100000E-020.320170E-03
0.396000E+040.198000E+000.179943E+020.179881E+02
0.179309E+020.320170E-03
200
0.199000E+000.100000E-020.286640E-03
0.398000E+040.199000E+000.179968E+020.179907E+02
0.179326E+020.286640E-03
201
0.200000E+000.100000E-020.255343E-03
0.400000E+040.200000E+000.179963E+020.179901E+02
0.179321E+020.255343E-03
202
0.201000E+000.100000E-020.388560E-03
0.402000E+040.201000E+000.179954E+020.179889E+02
0.179312E+020.388560E-03
203
0.202000E+000.100000E-020.249412E-03
0.404000E+040.202000E+000.179951E+020.179887E+02
0.179312E+020.249412E-03
204
0.203000E+000.100000E-020.337036E-03
0.406000E+040.203000E+000.179956E+020.179893E+02
0.179315E+020.337036E-03
205
0.204000E+000.100000E-020.246543E-03
0.408000E+040.204000E+000.179958E+020.179897E+02
0.179320E+020.246543E-03
206
0.205000E+000.100000E-020.200027E-03
0.410000E+040.205000E+000.179959E+020.179897E+02
0.179319E+020.200027E-03
207
0.206000E+000.100000E-020.200858E-03
0.412000E+040.206000E+000.179955E+020.179892E+02
0.179318E+020.200858E-03
208
0.207000E+000.100000E-020.629037E-03
0.414000E+040.207000E+000.179971E+020.179905E+02
0.179321E+020.629037E-03

209
0.208000E+000.100000E-020.434586E-03
0.416000E+040.208000E+000.179944E+020.179879E+02
0.179305E+020.434586E-03
210
0.209000E+000.100000E-020.340724E-03
0.418000E+040.209000E+000.179943E+020.179882E+02
0.179311E+020.340724E-03
211
0.210000E+000.100000E-020.399517E-03
0.420000E+040.210000E+000.179970E+020.179910E+02
0.179327E+020.399517E-03
212
0.211000E+000.100000E-020.237412E-03
0.422000E+040.211000E+000.179967E+020.179904E+02
0.179323E+020.237412E-03
213
0.212000E+000.100000E-020.302385E-03
0.424000E+040.212000E+000.179950E+020.179886E+02
0.179310E+020.302385E-03
214
0.213000E+000.100000E-020.228756E-03
0.426000E+040.213000E+000.179951E+020.179887E+02
0.179311E+020.228756E-03
215
0.214000E+000.100000E-020.171459E-03
0.428000E+040.214000E+000.179956E+020.179895E+02
0.179317E+020.171459E-03
216
0.215000E+000.100000E-020.204776E-03
0.430000E+040.215000E+000.179960E+020.179899E+02
0.179321E+020.204776E-03
217
0.216000E+000.100000E-020.110983E-03
0.432000E+040.216000E+000.179961E+020.179898E+02
0.179319E+020.110983E-03
218
0.217000E+000.100000E-020.131933E-03
0.434000E+040.217000E+000.179950E+020.179887E+02
0.179311E+020.131933E-03
219
0.218000E+000.100000E-020.294574E-03
0.436000E+040.218000E+000.179956E+020.179893E+02
0.179316E+020.294574E-03
220
0.219000E+000.100000E-020.186366E-03
0.438000E+040.219000E+000.179960E+020.179897E+02
0.179317E+020.186366E-03
221
0.220000E+000.100000E-020.198874E-03
0.440000E+040.220000E+000.179958E+020.179895E+02
0.179317E+020.198874E-03
222
0.221000E+000.100000E-020.218769E-03
0.442000E+040.221000E+000.179960E+020.179896E+02
0.179315E+020.218769E-03
223
0.222000E+000.100000E-020.210662E-03
0.444000E+040.222000E+000.179950E+020.179887E+02
0.179310E+020.210662E-03
224
0.223000E+000.100000E-020.158522E-03
0.446000E+040.223000E+000.179954E+020.179892E+02
0.179317E+020.158522E-03
225
0.224000E+000.100000E-020.436647E-03

0.448000E+040.224000E+000.179973E+020.179909E+02
0.179323E+020.436647E-03
226
0.225000E+000.100000E-020.295286E-03
0.450000E+040.225000E+000.179943E+020.179881E+02
0.179307E+020.295286E-03
227
0.226000E+000.100000E-020.308823E-03
0.452000E+040.226000E+000.179949E+020.179887E+02
0.179313E+020.308823E-03
228
0.227000E+000.100000E-020.353269E-03
0.454000E+040.227000E+000.179972E+020.179910E+02
0.179327E+020.353269E-03
229
0.228000E+000.100000E-020.294582E-03
0.456000E+040.228000E+000.179957E+020.179894E+02
0.179316E+020.294582E-03
230
0.229000E+000.100000E-020.293300E-03
0.458000E+040.229000E+000.179945E+020.179882E+02
0.179308E+020.293300E-03
231
0.230000E+000.100000E-020.320191E-03
0.460000E+040.230000E+000.179959E+020.179895E+02
0.179315E+020.320191E-03
232
0.231000E+000.100000E-020.320567E-03
0.462000E+040.231000E+000.179965E+020.179903E+02
0.179322E+020.320567E-03
233
0.232000E+000.100000E-020.164978E-03
0.464000E+040.232000E+000.179951E+020.179889E+02
0.179312E+020.164978E-03
234
0.233000E+000.100000E-020.172918E-03
0.466000E+040.233000E+000.179950E+020.179889E+02
0.179315E+020.172918E-03
235
0.234000E+000.100000E-020.438439E-03
0.468000E+040.234000E+000.179974E+020.179909E+02
0.179324E+020.438439E-03
236
0.235000E+000.100000E-020.246358E-03
0.470000E+040.235000E+000.179950E+020.179887E+02
0.179309E+020.246358E-03
237
0.236000E+000.100000E-020.263947E-03
0.472000E+040.236000E+000.179943E+020.179881E+02
0.179308E+020.263947E-03
238
0.237000E+000.100000E-020.207417E-03
0.474000E+040.237000E+000.179964E+020.179903E+02
0.179321E+020.207417E-03
239
0.238000E+000.100000E-020.255396E-03
0.476000E+040.238000E+000.179967E+020.179904E+02
0.179323E+020.255396E-03
240
0.239000E+000.100000E-020.415977E-03
0.478000E+040.239000E+000.179957E+020.179892E+02
0.179312E+020.415977E-03
241
0.240000E+000.100000E-020.334480E-03
0.480000E+040.240000E+000.179946E+020.179882E+02
0.179306E+020.334480E-03

242

0.241000E+000.100000E-020.361817E-03
0.482000E+040.241000E+000.179948E+020.179887E+02
0.179313E+020.361817E-03

243

0.242000E+000.100000E-020.339124E-03
0.484000E+040.242000E+000.179971E+020.179910E+02
0.179328E+020.339124E-03

244

0.243000E+000.100000E-020.411734E-03
0.486000E+040.243000E+000.179972E+020.179907E+02
0.179321E+020.411734E-03

245

0.244000E+000.100000E-020.333668E-03
0.488000E+040.244000E+000.179936E+020.179871E+02
0.179300E+020.333668E-03

246

0.245000E+000.100000E-020.218463E-03
0.490000E+040.245000E+000.179948E+020.179886E+02
0.179311E+020.218463E-03

247

0.246000E+000.100000E-020.304027E-03
0.492000E+040.246000E+000.179969E+020.179909E+02
0.179325E+020.304027E-03

248

0.247000E+000.100000E-020.277808E-03
0.494000E+040.247000E+000.179966E+020.179902E+02
0.179322E+020.277808E-03

249

0.248000E+000.100000E-020.286452E-03
0.496000E+040.248000E+000.179952E+020.179887E+02
0.179308E+020.286452E-03

250

0.249000E+000.100000E-020.266713E-03
0.498000E+040.249000E+000.179943E+020.179880E+02
0.179307E+020.266713E-03

251

0.250000E+000.100000E-020.235216E-03
0.500000E+040.250000E+000.179967E+020.179904E+02
0.179323E+020.235216E-03

252

0.251000E+000.100000E-020.139914E-03
0.502000E+040.251000E+000.179963E+020.179901E+02
0.179320E+020.139914E-03

253

0.252000E+000.100000E-020.205939E-03
0.504000E+040.252000E+000.179951E+020.179888E+02
0.179312E+020.205939E-03

254

0.253000E+000.100000E-020.213413E-03
0.506000E+040.253000E+000.179955E+020.179891E+02
0.179312E+020.213413E-03

255

0.254000E+000.100000E-020.139322E-03
0.508000E+040.254000E+000.179954E+020.179891E+02
0.179314E+020.139322E-03

256

0.255000E+000.100000E-020.226543E-03
0.510000E+040.255000E+000.179958E+020.179896E+02
0.179318E+020.226543E-03

257

0.256000E+000.100000E-020.180003E-03
0.512000E+040.256000E+000.179964E+020.179900E+02
0.179319E+020.180003E-03

258

0.257000E+000.100000E-020.150370E-03

0.514000E+040.257000E+000.179952E+020.179889E+02
0.179313E+020.150370E-03
259
0.258000E+000.100000E-020.228876E-03
0.516000E+040.258000E+000.179956E+020.179892E+02
0.179312E+020.228876E-03
260
0.259000E+000.100000E-020.141670E-03
0.518000E+040.259000E+000.179955E+020.179893E+02
0.179315E+020.141670E-03
261
0.260000E+000.100000E-020.130828E-03
0.520000E+040.260000E+000.179957E+020.179894E+02
0.179316E+020.130828E-03
262
0.261000E+000.100000E-020.330932E-03
0.522000E+040.261000E+000.179964E+020.179901E+02
0.179321E+020.330932E-03
263
0.262000E+000.100000E-020.227081E-03
0.524000E+040.262000E+000.179954E+020.179890E+02
0.179311E+020.227081E-03
264
0.263000E+000.100000E-020.182995E-03
0.526000E+040.263000E+000.179949E+020.179886E+02
0.179312E+020.182995E-03
265
0.264000E+000.100000E-020.137394E-03
0.528000E+040.264000E+000.179965E+020.179902E+02
0.179319E+020.137394E-03
266
0.265000E+000.100000E-020.193274E-03
0.530000E+040.265000E+000.179957E+020.179895E+02
0.179315E+020.193274E-03
267
0.266000E+000.100000E-020.169385E-03
0.532000E+040.266000E+000.179949E+020.179887E+02
0.179313E+020.169385E-03
268
0.267000E+000.100000E-020.203269E-03
0.534000E+040.267000E+000.179959E+020.179897E+02
0.179318E+020.203269E-03
269
0.268000E+000.100000E-020.181037E-03
0.536000E+040.268000E+000.179960E+020.179897E+02
0.179320E+020.181037E-03
270
0.269000E+000.100000E-020.293977E-03
0.538000E+040.269000E+000.179966E+020.179900E+02
0.179316E+020.293977E-03
271
0.270000E+000.100000E-020.212888E-03
0.540000E+040.270000E+000.179945E+020.179882E+02
0.179308E+020.212888E-03
272
0.271000E+000.100000E-020.256924E-03
0.542000E+040.271000E+000.179953E+020.179890E+02
0.179312E+020.256924E-03
273
0.272000E+000.100000E-020.234599E-03
0.544000E+040.272000E+000.179959E+020.179898E+02
0.179319E+020.234599E-03
274
0.273000E+000.100000E-020.310775E-03
0.546000E+040.273000E+000.179963E+020.179901E+02
0.179322E+020.310775E-03

275
0.274000E+000.100000E-020.205999E-03
0.548000E+040.274000E+000.179953E+020.179890E+02
0.179313E+020.205999E-03
276
0.275000E+000.100000E-020.179576E-03
0.550000E+040.275000E+000.179947E+020.179885E+02
0.179312E+020.179576E-03
277
0.276000E+000.100000E-020.239026E-03
0.552000E+040.276000E+000.179968E+020.179906E+02
0.179324E+020.239026E-03
278
0.277000E+000.100000E-020.339844E-03
0.554000E+040.277000E+000.179966E+020.179902E+02
0.179319E+020.339844E-03
279
0.278000E+000.100000E-020.346955E-03
0.556000E+040.278000E+000.179942E+020.179877E+02
0.179303E+020.346955E-03
280
0.279000E+000.100000E-020.183438E-03
0.558000E+040.279000E+000.179955E+020.179892E+02
0.179313E+020.183438E-03
281
0.280000E+000.100000E-020.180612E-03
0.560000E+040.280000E+000.179965E+020.179904E+02
0.179321E+020.180612E-03
282
0.281000E+000.100000E-020.141312E-03
0.562000E+040.281000E+000.179953E+020.179891E+02
0.179315E+020.141312E-03
283
0.282000E+000.100000E-020.211013E-03
0.564000E+040.282000E+000.179952E+020.179890E+02
0.179315E+020.211013E-03
284
0.283000E+000.100000E-020.148516E-03
0.566000E+040.283000E+000.179963E+020.179899E+02
0.179319E+020.148516E-03
285
0.284000E+000.100000E-020.243489E-03
0.568000E+040.284000E+000.179960E+020.179896E+02
0.179317E+020.243489E-03
286
0.285000E+000.100000E-020.176549E-03
0.570000E+040.285000E+000.179952E+020.179889E+02
0.179311E+020.176549E-03
287
0.286000E+000.100000E-020.199007E-03
0.572000E+040.286000E+000.179951E+020.179889E+02
0.179313E+020.199007E-03
288
0.287000E+000.100000E-020.180896E-03
0.574000E+040.287000E+000.179963E+020.179902E+02
0.179321E+020.180896E-03
289
0.288000E+000.100000E-020.165245E-03
0.576000E+040.288000E+000.179960E+020.179897E+02
0.179316E+020.165245E-03
290
0.289000E+000.100000E-020.245170E-03
0.578000E+040.289000E+000.179951E+020.179888E+02
0.179313E+020.245170E-03
291
0.290000E+000.100000E-020.207179E-03

0.580000E+040.290000E+000.179962E+020.179898E+02
0.179317E+020.207179E-03
292
0.291000E+000.100000E-020.199209E-03
0.582000E+040.291000E+000.179954E+020.179891E+02
0.179313E+020.199209E-03
293
0.292000E+000.100000E-020.178829E-03
0.584000E+040.292000E+000.179952E+020.179889E+02
0.179312E+020.178829E-03
294
0.293000E+000.100000E-020.321209E-03
0.586000E+040.293000E+000.179953E+020.179892E+02
0.179315E+020.321209E-03
295
0.294000E+000.100000E-020.240130E-03
0.588000E+040.294000E+000.179961E+020.179900E+02
0.179322E+020.240130E-03
296
0.295000E+000.100000E-020.252165E-03
0.590000E+040.295000E+000.179962E+020.179899E+02
0.179320E+020.252165E-03
297
0.296000E+000.100000E-020.471243E-03
0.592000E+040.296000E+000.179959E+020.179894E+02
0.179316E+020.471243E-03
298
0.297000E+000.100000E-020.380889E-03
0.594000E+040.297000E+000.179956E+020.179891E+02
0.179309E+020.380889E-03
299
0.298000E+000.100000E-020.346639E-03
0.596000E+040.298000E+000.179943E+020.179882E+02
0.179307E+020.346639E-03
300
0.299000E+000.100000E-020.269220E-03
0.598000E+040.299000E+000.179965E+020.179904E+02
0.179323E+020.269220E-03
301
0.300000E+000.100000E-020.151842E-03
0.600000E+040.300000E+000.179961E+020.179900E+02
0.179319E+020.151842E-03
302
0.301000E+000.100000E-020.220751E-03
0.602000E+040.301000E+000.179949E+020.179888E+02
0.179315E+020.220751E-03
303
0.302000E+000.100000E-020.326815E-03
0.604000E+040.302000E+000.179963E+020.179898E+02
0.179317E+020.326815E-03
304
0.303000E+000.100000E-020.253041E-03
0.606000E+040.303000E+000.179952E+020.179889E+02
0.179312E+020.253041E-03
305
0.304000E+000.100000E-020.177084E-03
0.608000E+040.304000E+000.179953E+020.179890E+02
0.179314E+020.177084E-03
306
0.305000E+000.100000E-020.190681E-03
0.610000E+040.305000E+000.179964E+020.179902E+02
0.179320E+020.190681E-03
307
0.306000E+000.100000E-020.100334E-03
0.612000E+040.306000E+000.179958E+020.179895E+02
0.179316E+020.100334E-03

308

0.307000E+000.100000E-020.206100E-03
0.614000E+040.307000E+000.179952E+020.179889E+02
0.179312E+020.206100E-03

309

0.308000E+000.100000E-020.210501E-03
0.616000E+040.308000E+000.179958E+020.179895E+02
0.179317E+020.210501E-03

310

0.309000E+000.100000E-020.253861E-03
0.618000E+040.309000E+000.179960E+020.179897E+02
0.179317E+020.253861E-03

311

0.310000E+000.100000E-020.273279E-03
0.620000E+040.310000E+000.179948E+020.179887E+02
0.179312E+020.273279E-03

312

0.311000E+000.100000E-020.261631E-03
0.622000E+040.311000E+000.179959E+020.179897E+02
0.179317E+020.261631E-03

313

0.312000E+000.100000E-020.200597E-03
0.624000E+040.312000E+000.179957E+020.179895E+02
0.179318E+020.200597E-03

314

0.313000E+000.100000E-020.425360E-03
0.626000E+040.313000E+000.179963E+020.179899E+02
0.179320E+020.425360E-03

315

0.314000E+000.100000E-020.288117E-03
0.628000E+040.314000E+000.179953E+020.179889E+02
0.179312E+020.288117E-03

316

0.314999E+000.100000E-020.286627E-03
0.630000E+040.314999E+000.179949E+020.179886E+02
0.179312E+020.286627E-03

317

0.315999E+000.100000E-020.234381E-03
0.632000E+040.315999E+000.179971E+020.179908E+02
0.179323E+020.234381E-03

318

0.316999E+000.100000E-020.256629E-03
0.634000E+040.316999E+000.179960E+020.179897E+02
0.179315E+020.256629E-03

319

0.317999E+000.100000E-020.251993E-03
0.636000E+040.317999E+000.179941E+020.179878E+02
0.179305E+020.251993E-03

320

0.318999E+000.100000E-020.257728E-03
0.638000E+040.318999E+000.179951E+020.179890E+02
0.179314E+020.257728E-03

321

0.319999E+000.100000E-020.285155E-03
0.640000E+040.319999E+000.179967E+020.179906E+02
0.179326E+020.285155E-03

322

0.320999E+000.100000E-020.250769E-03
0.642000E+040.320999E+000.179966E+020.179902E+02
0.179321E+020.250769E-03

323

0.321999E+000.100000E-020.227547E-03
0.644000E+040.321999E+000.179944E+020.179880E+02
0.179308E+020.227547E-03

324

0.322999E+000.100000E-020.151986E-03

0.646000E+040.322999E+000.179953E+020.179890E+02
0.179314E+020.151986E-03
325
0.323999E+000.100000E-020.126694E-03
0.648000E+040.323999E+000.179966E+020.179904E+02
0.179321E+020.126694E-03
326
0.324999E+000.100000E-020.234169E-03
0.650000E+040.324999E+000.179961E+020.179898E+02
0.179317E+020.234169E-03
327
0.325999E+000.100000E-020.196217E-03
0.652000E+040.325999E+000.179949E+020.179886E+02
0.179309E+020.196217E-03
328
0.326999E+000.100000E-020.172836E-03
0.654000E+040.326999E+000.179949E+020.179888E+02
0.179313E+020.172836E-03
329
0.327999E+000.100000E-020.176931E-03
0.656000E+040.327999E+000.179962E+020.179900E+02
0.179321E+020.176931E-03
330
0.328999E+000.100000E-020.152687E-03
0.658000E+040.328999E+000.179961E+020.179899E+02
0.179320E+020.152687E-03
331
0.329999E+000.100000E-020.184402E-03
0.660000E+040.329999E+000.179957E+020.179892E+02
0.179314E+020.184402E-03
332
0.330999E+000.100000E-020.213611E-03
0.662000E+040.330999E+000.179946E+020.179883E+02
0.179309E+020.213611E-03
333
0.331999E+000.100000E-020.191413E-03
0.664000E+040.331999E+000.179957E+020.179895E+02
0.179318E+020.191413E-03
334
0.332999E+000.100000E-020.207257E-03
0.666000E+040.332999E+000.179968E+020.179906E+02
0.179323E+020.207257E-03
335
0.333999E+000.100000E-020.264929E-03
0.668000E+040.333999E+000.179960E+020.179895E+02
0.179315E+020.264929E-03
336
0.334999E+000.100000E-020.300643E-03
0.670000E+040.334999E+000.179944E+020.179881E+02
0.179306E+020.300643E-03
337
0.335999E+000.100000E-020.138679E-03
0.672000E+040.335999E+000.179957E+020.179895E+02
0.179317E+020.138679E-03
338
0.336999E+000.100000E-020.329049E-03
0.674000E+040.336999E+000.179969E+020.179907E+02
0.179324E+020.329049E-03
339
0.337999E+000.100000E-020.247695E-03
0.676000E+040.337999E+000.179952E+020.179889E+02
0.179312E+020.247695E-03
340
0.338999E+000.100000E-020.388714E-03
0.678000E+040.338999E+000.179941E+020.179879E+02
0.179308E+020.388714E-03

341

0.339999E+000.100000E-020.271335E-03
0.680000E+040.339999E+000.179967E+020.179905E+02
0.179324E+020.271335E-03

342

0.340999E+000.100000E-020.238508E-03
0.682000E+040.340999E+000.179964E+020.179901E+02
0.179321E+020.238508E-03

343

0.341999E+000.100000E-020.231979E-03
0.684000E+040.341999E+000.179951E+020.179888E+02
0.179313E+020.231979E-03

344

0.342999E+000.100000E-020.275873E-03
0.686000E+040.342999E+000.179960E+020.179895E+02
0.179314E+020.275873E-03

345

0.343999E+000.100000E-020.247585E-03
0.688000E+040.343999E+000.179950E+020.179888E+02
0.179310E+020.247585E-03

346

0.344999E+000.100000E-020.199726E-03
0.690000E+040.344999E+000.179957E+020.179896E+02
0.179318E+020.199726E-03

347

0.345999E+000.100000E-020.176708E-03
0.692000E+040.345999E+000.179965E+020.179903E+02
0.179321E+020.176708E-03

348

0.346999E+000.100000E-020.358296E-03
0.694000E+040.346999E+000.179959E+020.179895E+02
0.179314E+020.358296E-03

349

0.347999E+000.100000E-020.425477E-03
0.696000E+040.347999E+000.179936E+020.179875E+02
0.179303E+020.425477E-03

350

0.348999E+000.100000E-020.259931E-03
0.698000E+040.348999E+000.179962E+020.179900E+02
0.179322E+020.259931E-03

351

0.349999E+000.100000E-020.265176E-03
0.700000E+040.349999E+000.179972E+020.179910E+02
0.179325E+020.265176E-03

352

0.350999E+000.100000E-020.214472E-03
0.702000E+040.350999E+000.179943E+020.179881E+02
0.179310E+020.214472E-03

353

0.351999E+000.100000E-020.215295E-03
0.704000E+040.351999E+000.179958E+020.179894E+02
0.179316E+020.215295E-03

354

0.352999E+000.100000E-020.304645E-03
0.706000E+040.352999E+000.179968E+020.179903E+02
0.179319E+020.304645E-03

355

0.353999E+000.100000E-020.171529E-03
0.708000E+040.353999E+000.179946E+020.179884E+02
0.179308E+020.171529E-03

356

0.354999E+000.100000E-020.155977E-03
0.710000E+040.354999E+000.179957E+020.179894E+02
0.179315E+020.155977E-03

357

0.355999E+000.100000E-020.195570E-03

0.712000E+040.355999E+000.179961E+020.179899E+02
0.179318E+020.195570E-03
358
0.356999E+000.100000E-020.147155E-03
0.714000E+040.356999E+000.179953E+020.179892E+02
0.179315E+020.147155E-03
359
0.357999E+000.100000E-020.162840E-03
0.716000E+040.357999E+000.179956E+020.179893E+02
0.179317E+020.162840E-03
360
0.358999E+000.100000E-020.209753E-03
0.718000E+040.358999E+000.179965E+020.179900E+02
0.179319E+020.209753E-03
361
0.359999E+000.100000E-020.233479E-03
0.720000E+040.359999E+000.179952E+020.179888E+02
0.179310E+020.233479E-03
362
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0.722000E+040.360999E+000.179950E+020.179887E+02
0.179311E+020.194325E-03
363
0.361999E+000.100000E-020.342882E-03
0.724000E+040.361999E+000.179953E+020.179893E+02
0.179316E+020.342882E-03
364
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0.726000E+040.362999E+000.179967E+020.179905E+02
0.179324E+020.236009E-03
365
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0.728000E+040.363999E+000.179964E+020.179900E+02
0.179317E+020.211935E-03
366
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0.179309E+020.320272E-03
367
0.365999E+000.100000E-020.240761E-03
0.732000E+040.365999E+000.179948E+020.179885E+02
0.179309E+020.240761E-03
368
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0.734000E+040.366999E+000.179958E+020.179897E+02
0.179319E+020.219250E-03
369
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0.736000E+040.367999E+000.179962E+020.179901E+02
0.179320E+020.301050E-03
370
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0.738000E+040.368999E+000.179957E+020.179893E+02
0.179316E+020.244076E-03
371
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0.179311E+020.192589E-03
372
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0.742000E+040.370999E+000.179961E+020.179898E+02
0.179318E+020.217200E-03
373
0.371999E+000.100000E-020.515690E-03
0.744000E+040.371999E+000.179966E+020.179902E+02
0.179321E+020.515690E-03

374

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0.746000E+040.372999E+000.179951E+020.179888E+02
0.179309E+020.304079E-03

375

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0.179309E+020.352923E-03

376

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0.179320E+020.254244E-03

377

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378

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0.179313E+020.196707E-03

379

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0.756000E+040.377999E+000.179956E+020.179893E+02
0.179316E+020.148471E-03

380

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0.179319E+020.212955E-03

381

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382

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0.179314E+020.248364E-03

383

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0.179322E+020.244865E-03

384

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385

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386

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0.179314E+020.190907E-03

387

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0.179319E+020.211115E-03

388

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0.179318E+020.250740E-03

389

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0.179311E+020.211799E-03

390

0.388999E+000.100000E-020.130449E-03

Τ.Ε.Ι. ΠΑΤΡΑΣ
ΒΙΒΛΙΟΘΗΚΗ

0.778000E+040.388999E+000.179952E+020.179889E+02
0.179314E+020.130449E-03
391
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0.780000E+040.389999E+000.179961E+020.179900E+02
0.179319E+020.219363E-03
392
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0.179318E+020.350917E-03
393
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0.179308E+020.313909E-03
394
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0.179316E+020.236545E-03
395
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0.179316E+020.138618E-03
397
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398
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0.179322E+020.209664E-03
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0.179317E+020.195288E-03
403
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404
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0.179315E+020.180076E-03
405
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0.179323E+020.187472E-03
406
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0.179318E+020.349019E-03

407
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408
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409
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410
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412
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415
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416
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417
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418
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421
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422
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423
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424
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0.179324E+020.179488E-03
425
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0.179322E+020.342324E-03
426
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0.850000E+040.424998E+000.179947E+020.179883E+02
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427
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428
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429
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430
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431
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432
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433
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434
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435
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0.179311E+020.236983E-03
436
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0.179322E+020.187381E-03
437
0.435998E+000.100000E-020.141055E-03
0.872000E+040.435998E+000.179958E+020.179896E+02
0.179316E+020.141055E-03
438
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439
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440

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441

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442

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443

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0.179320E+020.199167E-03

444

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0.886000E+040.442998E+000.179966E+020.179903E+02
0.179322E+020.500060E-03

445

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0.888000E+040.443998E+000.179949E+020.179886E+02
0.179308E+020.338310E-03

446

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447

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0.892000E+040.445998E+000.179964E+020.179903E+02
0.179323E+020.240894E-03

448

0.446998E+000.100000E-020.188477E-03
0.894000E+040.446998E+000.179962E+020.179900E+02
0.179320E+020.188477E-03

449

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0.896000E+040.447998E+000.179948E+020.179886E+02
0.179313E+020.175010E-03

450

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0.898000E+040.448998E+000.179965E+020.179900E+02
0.179320E+020.340165E-03

451

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0.900000E+040.449998E+000.179960E+020.179895E+02
0.179315E+020.303010E-03

452

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0.902000E+040.450998E+000.179946E+020.179883E+02
0.179309E+020.205873E-03

453

0.451998E+000.100000E-020.142881E-03
0.904000E+040.451998E+000.179956E+020.179896E+02
0.179319E+020.142881E-03

454

0.452998E+000.100000E-020.168108E-03
0.906000E+040.452998E+000.179969E+020.179907E+02
0.179323E+020.168108E-03

455

0.453998E+000.100000E-020.318612E-03
0.908000E+040.453998E+000.179954E+020.179890E+02
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456

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457
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0.179315E+020.309150E-03
458
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0.914000E+040.456998E+000.179967E+020.179905E+02
0.179324E+020.269036E-03
459
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460
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0.918000E+040.458998E+000.179952E+020.179889E+02
0.179313E+020.228402E-03
461
0.459998E+000.100000E-020.244342E-03
0.920000E+040.459998E+000.179958E+020.179893E+02
0.179313E+020.244342E-03
462
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0.922000E+040.460998E+000.179950E+020.179889E+02
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463
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0.924000E+040.461998E+000.179967E+020.179904E+02
0.179322E+020.268488E-03
464
0.462998E+000.100000E-020.146889E-03
0.926000E+040.462998E+000.179954E+020.179892E+02
0.179314E+020.146889E-03
465
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0.179311E+020.230534E-03
466
0.464998E+000.100000E-020.136474E-03
0.930000E+040.464998E+000.179964E+020.179902E+02
0.179321E+020.136474E-03
467
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0.179318E+020.212444E-03
468
0.466998E+000.100000E-020.186899E-03
0.934000E+040.466998E+000.179957E+020.179894E+02
0.179316E+020.186899E-03
469
0.467998E+000.100000E-020.221213E-03
0.936000E+040.467998E+000.179953E+020.179891E+02
0.179313E+020.221213E-03
470
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0.938000E+040.468998E+000.179959E+020.179895E+02
0.179316E+020.164135E-03
471
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0.940000E+040.469997E+000.179957E+020.179895E+02
0.179317E+020.178484E-03
472
0.470997E+000.100000E-020.269834E-03
0.942000E+040.470997E+000.179961E+020.179897E+02
0.179317E+020.269834E-03

473

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0.944000E+040.471997E+000.179951E+020.179888E+02
0.179312E+020.198363E-03

474

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0.946000E+040.472997E+000.179961E+020.179898E+02
0.179317E+020.195925E-03

475

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0.948000E+040.473997E+000.179953E+020.179892E+02
0.179313E+020.266209E-03

476

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0.950000E+040.474997E+000.179948E+020.179886E+02
0.179312E+020.255208E-03

477

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0.179321E+020.360351E-03

478

0.476997E+000.100000E-020.345905E-03
0.954000E+040.476997E+000.179978E+020.179913E+02
0.179326E+020.345905E-03

479

0.477997E+000.100000E-020.342691E-03
0.956000E+040.477997E+000.179948E+020.179882E+02
0.179307E+020.342691E-03

480

0.478997E+000.100000E-020.240680E-03
0.958000E+040.478997E+000.179950E+020.179885E+02
0.179310E+020.240680E-03

481

0.479997E+000.100000E-020.152937E-03
0.960000E+040.479997E+000.179958E+020.179898E+02
0.179317E+020.152937E-03

482

0.480997E+000.100000E-020.133781E-03
0.962000E+040.480997E+000.179959E+020.179898E+02
0.179319E+020.133781E-03

483

0.481997E+000.100000E-020.255294E-03
0.964000E+040.481997E+000.179958E+020.179896E+02
0.179318E+020.255294E-03

484

0.482997E+000.100000E-020.277747E-03
0.966000E+040.482997E+000.179960E+020.179894E+02
0.179313E+020.277747E-03

485

0.483997E+000.100000E-020.423284E-03
0.968000E+040.483997E+000.179936E+020.179875E+02
0.179306E+020.423284E-03

486

0.484997E+000.100000E-020.353436E-03
0.970000E+040.484997E+000.179963E+020.179902E+02
0.179324E+020.353436E-03

487

0.485997E+000.100000E-020.296176E-03
0.972000E+040.485997E+000.179976E+020.179913E+02
0.179327E+020.296176E-03

488

0.486997E+000.100000E-020.611429E-03
0.974000E+040.486997E+000.179959E+020.179892E+02
0.179312E+020.611429E-03

489

0.487997E+000.100000E-020.463846E-03

0.976000E+040.487997E+000.179937E+020.179873E+02
0.179300E+020.463846E-03
490
0.488997E+000.100000E-020.386189E-03
0.978000E+040.488997E+000.179950E+020.179888E+02
0.179313E+020.386189E-03
491
0.489997E+000.100000E-020.375736E-03
0.980000E+040.489997E+000.179972E+020.179913E+02
0.179330E+020.375736E-03
492
0.490997E+000.100000E-020.318527E-03
0.982000E+040.490997E+000.179970E+020.179906E+02
0.179321E+020.318527E-03
493
0.491997E+000.100000E-020.404262E-03
0.984000E+040.491997E+000.179931E+020.179869E+02
0.179301E+020.404262E-03
494
0.492997E+000.100000E-020.214684E-03
0.986000E+040.492997E+000.179954E+020.179891E+02
0.179315E+020.214684E-03
495
0.493997E+000.100000E-020.325505E-03
0.988000E+040.493997E+000.179976E+020.179912E+02
0.179328E+020.325505E-03
496
0.494997E+000.100000E-020.268096E-03
0.990000E+040.494997E+000.179958E+020.179894E+02
0.179315E+020.268096E-03
497
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0.179307E+020.294473E-03
498
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0.994000E+040.496997E+000.179953E+020.179891E+02
0.179312E+020.140232E-03
499
0.497997E+000.100000E-020.303468E-03
0.996000E+040.497997E+000.179951E+020.179891E+02
0.179316E+020.303468E-03
500
0.498997E+000.100000E-020.235710E-03
0.998000E+040.498997E+000.179968E+020.179906E+02
0.179325E+020.235710E-03
501
0.499997E+000.100000E-020.345429E-03
0.100000E+050.499997E+000.179963E+020.179899E+02
0.179318E+020.345429E-03
502
0.500997E+000.100000E-020.314849E-03
0.100200E+050.500997E+000.179945E+020.179881E+02
0.179306E+020.314849E-03
503
0.501997E+000.100000E-020.210587E-03
0.100400E+050.501997E+000.179952E+020.179889E+02
0.179312E+020.210587E-03
504
0.502997E+000.100000E-020.268313E-03
0.100600E+050.502997E+000.179959E+020.179899E+02
0.179320E+020.268313E-03
505
0.503997E+000.100000E-020.230066E-03
0.100800E+050.503997E+000.179967E+020.179904E+02
0.179323E+020.230066E-03

506

0.504997E+000.100000E-020.183087E-03
0.101000E+050.504997E+000.179950E+020.179887E+02
0.179311E+020.183087E-03

507

0.505997E+000.100000E-020.267619E-03
0.101200E+050.505997E+000.179952E+020.179887E+02
0.179312E+020.267619E-03

508

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0.101400E+050.506997E+000.179970E+020.179907E+02
0.179321E+020.253065E-03

509

0.507997E+000.100000E-020.228932E-03
0.101600E+050.507997E+000.179954E+020.179891E+02
0.179311E+020.228932E-03

510

0.508997E+000.100000E-020.214214E-03
0.101800E+050.508997E+000.179941E+020.179880E+02
0.179307E+020.214214E-03

511

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0.102000E+050.509997E+000.179958E+020.179898E+02
0.179319E+020.371229E-03

512

0.510997E+000.100000E-020.345801E-03
0.102200E+050.510997E+000.179970E+020.179907E+02
0.179326E+020.345801E-03

513

0.511997E+000.100000E-020.229515E-03
0.102400E+050.511997E+000.179957E+020.179893E+02
0.179313E+020.229515E-03

514

0.512997E+000.100000E-020.225376E-03
0.102600E+050.512997E+000.179941E+020.179878E+02
0.179306E+020.225376E-03

515

0.513997E+000.100000E-020.202911E-03
0.102800E+050.513997E+000.179958E+020.179897E+02
0.179319E+020.202911E-03

516

0.514997E+000.100000E-020.503816E-03
0.103000E+050.514997E+000.179981E+020.179916E+02
0.179327E+020.503816E-03

517

0.515997E+000.100000E-020.377588E-03
0.103200E+050.515997E+000.179947E+020.179883E+02
0.179305E+020.377588E-03

518

0.516997E+000.100000E-020.306124E-03
0.103400E+050.516997E+000.179939E+020.179876E+02
0.179303E+020.306124E-03

519

0.517997E+000.100000E-020.325939E-03
0.103600E+050.517997E+000.179960E+020.179900E+02
0.179321E+020.325939E-03

520

0.518997E+000.100000E-020.247467E-03
0.103800E+050.518997E+000.179969E+020.179908E+02
0.179324E+020.247467E-03

521

0.519997E+000.100000E-020.356189E-03
0.104000E+050.519997E+000.179956E+020.179893E+02
0.179316E+020.356189E-03

522

0.520997E+000.100000E-020.276674E-03

0.104200E+050.520997E+000.179951E+020.179886E+02
0.179309E+020.276674E-03
523
0.521997E+000.100000E-020.159297E-03
0.104400E+050.521997E+000.179952E+020.179889E+02
0.179313E+020.159297E-03
524
0.522997E+000.100000E-020.132624E-03
0.104600E+050.522997E+000.179964E+020.179902E+02
0.179320E+020.132624E-03
525
0.523997E+000.100000E-020.136300E-03
0.104800E+050.523997E+000.179962E+020.179899E+02
0.179318E+020.136300E-03
526
0.524997E+000.100000E-020.213279E-03
0.105000E+050.524997E+000.179955E+020.179891E+02
0.179312E+020.213279E-03
527
0.525997E+000.100000E-020.198138E-03
0.105200E+050.525997E+000.179958E+020.179894E+02
0.179313E+020.198138E-03
528
0.526997E+000.100000E-020.191482E-03
0.105400E+050.526997E+000.179954E+020.179892E+02
0.179313E+020.191482E-03
529
0.527997E+000.100000E-020.211384E-03
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0.179312E+020.211384E-03
530
0.528997E+000.100000E-020.272450E-03
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0.179315E+020.272450E-03
531
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0.106000E+050.529997E+000.179962E+020.179901E+02
0.179321E+020.265878E-03
532
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0.106200E+050.530997E+000.179969E+020.179904E+02
0.179321E+020.406695E-03
533
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0.106400E+050.531997E+000.179938E+020.179875E+02
0.179304E+020.284173E-03
534
0.532997E+000.100000E-020.152404E-03
0.106600E+050.532997E+000.179956E+020.179894E+02
0.179317E+020.152404E-03
535
0.533997E+000.100000E-020.297830E-03
0.106800E+050.533997E+000.179980E+020.179917E+02
0.179327E+020.297830E-03
536
0.534997E+000.100000E-020.295862E-03
0.107000E+050.534997E+000.179947E+020.179883E+02
0.179306E+020.295862E-03
537
0.535997E+000.100000E-020.208395E-03
0.107200E+050.535997E+000.179942E+020.179879E+02
0.179307E+020.208395E-03
538
0.536997E+000.100000E-020.170882E-03
0.107400E+050.536997E+000.179964E+020.179902E+02
0.179320E+020.170882E-03

539

0.537997E+000.100000E-020.217079E-03
0.107600E+050.537997E+000.179959E+020.179898E+02
0.179320E+020.217079E-03

540

0.538997E+000.100000E-020.143722E-03
0.107800E+050.538997E+000.179959E+020.179896E+02
0.179316E+020.143722E-03

541

0.539997E+000.100000E-020.166703E-03
0.108000E+050.539997E+000.179954E+020.179890E+02
0.179313E+020.166703E-03

542

0.540997E+000.100000E-020.222248E-03
0.108200E+050.540997E+000.179957E+020.179893E+02
0.179314E+020.222248E-03

543

0.541997E+000.100000E-020.289920E-03
0.108400E+050.541997E+000.179958E+020.179895E+02
0.179315E+020.289920E-03

544

0.542997E+000.100000E-020.211045E-03
0.108600E+050.542997E+000.179953E+020.179891E+02
0.179314E+020.211045E-03

545

0.543997E+000.100000E-020.173381E-03
0.108800E+050.543997E+000.179957E+020.179896E+02
0.179316E+020.173381E-03

546

0.544997E+000.100000E-020.220864E-03
0.109000E+050.544997E+000.179962E+020.179899E+02
0.179319E+020.220864E-03

547

0.545997E+000.100000E-020.181095E-03
0.109200E+050.545997E+000.179953E+020.179890E+02
0.179312E+020.181095E-03

548

0.546997E+000.100000E-020.224865E-03
0.109400E+050.546997E+000.179946E+020.179884E+02
0.179311E+020.224865E-03

549

0.547997E+000.100000E-020.310797E-03
0.109600E+050.547997E+000.179969E+020.179906E+02
0.179325E+020.310797E-03

550

0.548997E+000.100000E-020.389095E-03
0.109800E+050.548997E+000.179971E+020.179905E+02
0.179320E+020.389095E-03

551

0.549996E+000.100000E-020.368540E-03
0.110000E+050.549996E+000.179935E+020.179870E+02
0.179300E+020.368540E-03

552

0.550996E+000.100000E-020.188654E-03
0.110200E+050.550996E+000.179955E+020.179892E+02
0.179315E+020.188654E-03

553

0.551996E+000.100000E-020.250247E-03
0.110400E+050.551996E+000.179969E+020.179907E+02
0.179322E+020.250247E-03

554

0.552996E+000.100000E-020.227769E-03
0.110600E+050.552996E+000.179952E+020.179891E+02
0.179316E+020.227769E-03

555

0.553996E+000.100000E-020.108589E-03

0.110800E+050.553996E+000.179958E+020.179895E+02
0.179316E+020.108589E-03
556
0.554996E+000.100000E-020.281748E-03
0.111000E+050.554996E+000.179961E+020.179896E+02
0.179316E+020.281748E-03
557
0.555996E+000.100000E-020.191730E-03
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0.179310E+020.191730E-03
558
0.556996E+000.100000E-020.141137E-03
0.111400E+050.556996E+000.179956E+020.179894E+02
0.179315E+020.141137E-03
559
0.557996E+000.100000E-020.136727E-03
0.111600E+050.557996E+000.179960E+020.179899E+02
0.179320E+020.136727E-03
560
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0.111800E+050.558996E+000.179959E+020.179897E+02
0.179317E+020.920642E-04
561
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0.112000E+050.559996E+000.179957E+020.179893E+02
0.179315E+020.360014E-03
562
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0.112200E+050.560996E+000.179952E+020.179889E+02
0.179312E+020.248523E-03
563
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0.112400E+050.561996E+000.179949E+020.179888E+02
0.179313E+020.297055E-03
564
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0.112600E+050.562996E+000.179964E+020.179903E+02
0.179324E+020.268002E-03
565
0.563996E+000.100000E-020.333796E-03
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0.179321E+020.333796E-03
566
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567
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0.113200E+050.565996E+000.179951E+020.179888E+02
0.179312E+020.220762E-03
568
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0.179325E+020.242692E-03
569
0.567996E+000.100000E-020.293828E-03
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570
0.568996E+000.100000E-020.283203E-03
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0.179308E+020.283203E-03
571
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0.114000E+050.569996E+000.179950E+020.179888E+02
0.179313E+020.196421E-03

572

0.570996E+000.100000E-020.226432E-03
0.114200E+050.570996E+000.179962E+020.179901E+02
0.179321E+020.226432E-03

573

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0.114400E+050.571996E+000.179964E+020.179902E+02
0.179322E+020.266311E-03

574

0.572996E+000.100000E-020.294854E-03
0.114600E+050.572996E+000.179957E+020.179892E+02
0.179312E+020.294854E-03

575

0.573996E+000.100000E-020.218591E-03
0.114800E+050.573996E+000.179948E+020.179884E+02
0.179309E+020.218591E-03

576

0.574996E+000.100000E-020.194199E-03
0.115000E+050.574996E+000.179960E+020.179898E+02
0.179317E+020.194199E-03

577

0.575996E+000.100000E-020.202470E-03
0.115200E+050.575996E+000.179957E+020.179896E+02
0.179318E+020.202470E-03

578

0.576996E+000.100000E-020.286410E-03
0.115400E+050.576996E+000.179960E+020.179897E+02
0.179318E+020.286410E-03

579

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0.115600E+050.577996E+000.179954E+020.179890E+02
0.179312E+020.238248E-03

580

0.578996E+000.100000E-020.202197E-03
0.115800E+050.578996E+000.179950E+020.179888E+02
0.179313E+020.202197E-03

581

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0.116000E+050.579996E+000.179959E+020.179898E+02
0.179319E+020.194454E-03

582

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0.116200E+050.580996E+000.179962E+020.179900E+02
0.179320E+020.130850E-03

583

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0.116400E+050.581996E+000.179957E+020.179893E+02
0.179314E+020.172171E-03

584

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0.116600E+050.582996E+000.179959E+020.179894E+02
0.179315E+020.406012E-03

585

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0.116800E+050.583996E+000.179953E+020.179889E+02
0.179310E+020.276639E-03

586

0.584996E+000.100000E-020.292437E-03
0.117000E+050.584996E+000.179952E+020.179890E+02
0.179313E+020.292437E-03

587

0.585996E+000.100000E-020.292444E-03
0.117200E+050.585996E+000.179963E+020.179902E+02
0.179320E+020.292444E-03

588

0.586996E+000.100000E-020.222474E-03

0.117400E+050.586996E+000.179961E+020.179898E+02
0.179318E+020.222474E-03
589
0.587996E+000.100000E-020.163878E-03
0.117600E+050.587996E+000.179948E+020.179885E+02
0.179311E+020.163878E-03
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0.588996E+000.100000E-020.364220E-03
0.117800E+050.588996E+000.179958E+020.179895E+02
0.179318E+020.364220E-03
591
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0.118000E+050.589996E+000.179960E+020.179897E+02
0.179317E+020.260937E-03
592
0.590996E+000.100000E-020.316730E-03
0.118200E+050.590996E+000.179949E+020.179888E+02
0.179312E+020.316730E-03
593
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0.118400E+050.591996E+000.179964E+020.179900E+02
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0.118800E+050.593996E+000.179955E+020.179891E+02
0.179313E+020.203220E-03
596
0.594996E+000.100000E-020.154712E-03
0.119000E+050.594996E+000.179954E+020.179891E+02
0.179313E+020.154712E-03
597
0.595996E+000.100000E-020.230224E-03
0.119200E+050.595996E+000.179956E+020.179893E+02
0.179315E+020.230224E-03
598
0.596996E+000.100000E-020.230466E-03
0.119400E+050.596996E+000.179964E+020.179902E+02
0.179320E+020.230466E-03
599
0.597996E+000.100000E-020.244608E-03
0.119600E+050.597996E+000.179954E+020.179891E+02
0.179312E+020.244608E-03
600
0.598996E+000.100000E-020.277676E-03
0.119800E+050.598996E+000.179948E+020.179887E+02
0.179313E+020.277676E-03
601
0.599996E+000.100000E-020.315083E-03
0.120000E+050.599996E+000.179956E+020.179894E+02
0.179316E+020.315083E-03
602
0.600996E+000.100000E-020.248214E-03
0.120200E+050.600996E+000.179960E+020.179899E+02
0.179322E+020.248214E-03
603
0.601996E+000.100000E-020.318306E-03
0.120400E+050.601996E+000.179971E+020.179906E+02
0.179320E+020.318306E-03
604
0.602996E+000.100000E-020.307835E-03
0.120600E+050.602996E+000.179946E+020.179881E+02
0.179304E+020.307835E-03

605

0.603996E+000.100000E-020.288894E-03
0.120800E+050.603996E+000.179942E+020.179880E+02
0.179308E+020.288894E-03

606

0.604996E+000.100000E-020.265360E-03
0.121000E+050.604996E+000.179971E+020.179910E+02
0.179326E+020.265360E-03

607

0.605996E+000.100000E-020.267061E-03
0.121200E+050.605996E+000.179967E+020.179904E+02
0.179321E+020.267061E-03

608

0.606996E+000.100000E-020.295200E-03
0.121400E+050.606996E+000.179946E+020.179882E+02
0.179308E+020.295200E-03

609

0.607996E+000.100000E-020.271481E-03
0.121600E+050.607996E+000.179946E+020.179884E+02
0.179310E+020.271481E-03

610

0.608996E+000.100000E-020.287998E-03
0.121800E+050.608996E+000.179965E+020.179904E+02
0.179323E+020.287998E-03

611

0.609996E+000.100000E-020.224068E-03
0.122000E+050.609996E+000.179962E+020.179900E+02
0.179320E+020.224068E-03

612

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0.122200E+050.610996E+000.179950E+020.179887E+02
0.179311E+020.172911E-03

613

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0.122400E+050.611996E+000.179958E+020.179894E+02
0.179315E+020.199689E-03

614

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0.122600E+050.612996E+000.179961E+020.179897E+02
0.179315E+020.190949E-03

615

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0.122800E+050.613996E+000.179947E+020.179885E+02
0.179310E+020.236712E-03

616

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0.123000E+050.614996E+000.179957E+020.179896E+02
0.179317E+020.232436E-03

617

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0.123200E+050.615996E+000.179964E+020.179902E+02
0.179321E+020.210192E-03

618

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0.123400E+050.616996E+000.179958E+020.179894E+02
0.179316E+020.245936E-03

619

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0.123600E+050.617996E+000.179948E+020.179885E+02
0.179310E+020.216431E-03

620

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0.123800E+050.618996E+000.179957E+020.179895E+02
0.179316E+020.134727E-03

621

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0.124000E+050.619996E+000.179960E+020.179898E+02
0.179318E+020.174363E-03
622
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0.124200E+050.620996E+000.179963E+020.179899E+02
0.179318E+020.245544E-03
623
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0.124400E+050.621996E+000.179946E+020.179884E+02
0.179309E+020.234886E-03
624
0.622996E+000.100000E-020.131741E-03
0.124600E+050.622996E+000.179954E+020.179892E+02
0.179316E+020.131741E-03
625
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0.124800E+050.623996E+000.179966E+020.179904E+02
0.179322E+020.188497E-03
626
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0.125000E+050.624996E+000.179961E+020.179897E+02
0.179318E+020.258589E-03
627
0.625996E+000.100000E-020.301423E-03
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0.179306E+020.301423E-03
628
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631
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0.179304E+020.401210E-03
632
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0.126200E+050.630995E+000.179939E+020.179877E+02
0.179305E+020.381808E-03
633
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0.126400E+050.631995E+000.179970E+020.179909E+02
0.179326E+020.314600E-03
634
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0.179321E+020.165156E-03
635
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0.179308E+020.149186E-03
636
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0.127000E+050.634995E+000.179959E+020.179895E+02
0.179316E+020.249508E-03
637
0.635995E+000.100000E-020.207685E-03
0.127200E+050.635995E+000.179957E+020.179895E+02
0.179315E+020.207685E-03

638

0.636995E+000.100000E-020.293593E-03
0.127400E+050.636995E+000.179950E+020.179888E+02
0.179314E+020.293593E-03

639

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0.127600E+050.637995E+000.179963E+020.179900E+02
0.179321E+020.213273E-03

640

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0.127800E+050.638995E+000.179963E+020.179899E+02
0.179319E+020.166300E-03

641

0.639995E+000.100000E-020.348731E-03
0.128000E+050.639995E+000.179957E+020.179893E+02
0.179313E+020.348731E-03

642

0.640995E+000.100000E-020.249495E-03
0.128200E+050.640995E+000.179947E+020.179884E+02
0.179308E+020.249495E-03

643

0.641995E+000.100000E-020.270814E-03
0.128400E+050.641995E+000.179954E+020.179893E+02
0.179316E+020.270814E-03

644

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0.128600E+050.642995E+000.179974E+020.179912E+02
0.179326E+020.267213E-03

645

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0.128800E+050.643995E+000.179947E+020.179884E+02
0.179308E+020.237838E-03

646

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0.129000E+050.644995E+000.179945E+020.179883E+02
0.179311E+020.183057E-03

647

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0.129200E+050.645995E+000.179972E+020.179909E+02
0.179324E+020.309819E-03

648

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0.129400E+050.646995E+000.179956E+020.179893E+02
0.179315E+020.288199E-03

649

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0.129600E+050.647995E+000.179951E+020.179887E+02
0.179309E+020.273706E-03

650

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0.179313E+020.235842E-03

651

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0.130000E+050.649995E+000.179960E+020.179898E+02
0.179319E+020.226361E-03

652

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0.179315E+020.141828E-03

653

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0.130400E+050.651995E+000.179951E+020.179889E+02
0.179313E+020.131262E-03

654

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656
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0.179311E+020.221621E-03
657
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0.131200E+050.655995E+000.179965E+020.179902E+02
0.179321E+020.150966E-03
658
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0.131400E+050.656995E+000.179962E+020.179899E+02
0.179319E+020.246243E-03
659
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660
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661
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0.132000E+050.659995E+000.179956E+020.179894E+02
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662
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663
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0.132400E+050.661995E+000.179964E+020.179901E+02
0.179321E+020.209713E-03
664
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0.179319E+020.350013E-03
665
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0.179311E+020.278916E-03
666
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667
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668
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669
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670
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0.179314E+020.162191E-03

671
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0.179320E+020.157516E-03

672
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0.134200E+050.670995E+000.179966E+020.179902E+02
0.179320E+020.260069E-03

673
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674
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0.179311E+020.200139E-03

675
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0.179321E+020.204676E-03

676
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0.135000E+050.674995E+000.179962E+020.179901E+02
0.179320E+020.157235E-03

677
0.675995E+000.100000E-020.297900E-03
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0.179314E+020.297900E-03

678
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0.179304E+020.340581E-03

679
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0.179329E+020.324101E-03

681
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0.136000E+050.679995E+000.179970E+020.179906E+02
0.179320E+020.379227E-03

682
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0.179300E+020.395190E-03

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0.136400E+050.681995E+000.179953E+020.179889E+02
0.179313E+020.247961E-03

684
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0.179326E+020.276585E-03

685
0.683995E+000.100000E-020.144748E-03
0.136800E+050.683995E+000.179953E+020.179891E+02
0.179313E+020.144748E-03

686
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0.137000E+050.684995E+000.179944E+020.179882E+02
0.179309E+020.160977E-03

687
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0.179320E+020.227473E-03
689
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691
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0.179321E+020.145866E-03
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0.179322E+020.227786E-03
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0.179321E+020.145775E-03
701
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0.140000E+050.699995E+000.179952E+020.179888E+02
0.179312E+020.216222E-03
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0.179312E+020.190687E-03
703
0.701995E+000.100000E-020.138814E-03
0.140400E+050.701995E+000.179956E+020.179893E+02
0.179315E+020.138814E-03

704
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0.140600E+050.702995E+000.179956E+020.179895E+02
0.179318E+020.219104E-03
705
0.703995E+000.100000E-020.290139E-03
0.140800E+050.703995E+000.179965E+020.179903E+02
0.179322E+020.290139E-03
706
0.704994E+000.100000E-020.258531E-03
0.141000E+050.704994E+000.179952E+020.179889E+02
0.179312E+020.258531E-03
707
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0.141200E+050.705994E+000.179949E+020.179886E+02
0.179311E+020.240242E-03
708
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0.141400E+050.706994E+000.179959E+020.179899E+02
0.179320E+020.186900E-03
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0.707994E+000.100000E-020.247911E-03
0.141600E+050.707994E+000.179965E+020.179903E+02
0.179320E+020.247911E-03
710
0.708994E+000.100000E-020.205344E-03
0.141800E+050.708994E+000.179950E+020.179886E+02
0.179312E+020.205344E-03
711
0.709994E+000.100000E-020.139698E-03
0.142000E+050.709994E+000.179955E+020.179891E+02
0.179314E+020.139698E-03
712
0.710994E+000.100000E-020.175681E-03
0.142200E+050.710994E+000.179960E+020.179898E+02
0.179318E+020.175681E-03
713
0.711994E+000.100000E-020.251899E-03
0.142400E+050.711994E+000.179957E+020.179895E+02
0.179317E+020.251899E-03
714
0.712994E+000.100000E-020.199683E-03
0.142600E+050.712994E+000.179948E+020.179887E+02
0.179313E+020.199683E-03
715
0.713994E+000.100000E-020.193026E-03
0.142800E+050.713994E+000.179962E+020.179900E+02
0.179320E+020.193026E-03
716
0.714994E+000.100000E-020.273562E-03
0.143000E+050.714994E+000.179968E+020.179904E+02
0.179320E+020.273562E-03
717
0.715994E+000.100000E-020.240494E-03
0.143200E+050.715994E+000.179944E+020.179881E+02
0.179306E+020.240494E-03
718
0.716994E+000.100000E-020.200100E-03
0.143400E+050.716994E+000.179947E+020.179886E+02
0.179313E+020.200100E-03
719
0.717994E+000.100000E-020.206758E-03
0.143600E+050.717994E+000.179971E+020.179908E+02
0.179325E+020.206758E-03
720
0.718994E+000.100000E-020.209767E-03

0.143800E+050.718994E+000.179959E+020.179896E+02
0.179319E+020.209767E-03
721
0.719994E+000.100000E-020.181881E-03
0.144000E+050.719994E+000.179951E+020.179887E+02
0.179311E+020.181881E-03
722
0.720994E+000.100000E-020.128555E-03
0.144200E+050.720994E+000.179955E+020.179892E+02
0.179315E+020.128555E-03
723
0.721994E+000.100000E-020.181753E-03
0.144400E+050.721994E+000.179956E+020.179895E+02
0.179317E+020.181753E-03
724
0.722994E+000.100000E-020.150216E-03
0.144600E+050.722994E+000.179959E+020.179896E+02
0.179317E+020.150216E-03
725
0.723994E+000.100000E-020.230493E-03
0.144800E+050.723994E+000.179958E+020.179894E+02
0.179317E+020.230493E-03
726
0.724994E+000.100000E-020.148284E-03
0.145000E+050.724994E+000.179958E+020.179895E+02
0.179314E+020.148284E-03
727
0.725994E+000.100000E-020.257538E-03
0.145200E+050.725994E+000.179949E+020.179887E+02
0.179311E+020.257538E-03
728
0.726994E+000.100000E-020.266431E-03
0.145400E+050.726994E+000.179964E+020.179901E+02
0.179321E+020.266431E-03
729
0.727994E+000.100000E-020.296434E-03
0.145600E+050.727994E+000.179963E+020.179900E+02
0.179317E+020.296434E-03
730
0.728994E+000.100000E-020.209679E-03
0.145800E+050.728994E+000.179944E+020.179882E+02
0.179309E+020.209679E-03
731
0.729994E+000.100000E-020.288568E-03
0.146000E+050.729994E+000.179954E+020.179892E+02
0.179315E+020.288568E-03
732
0.730994E+000.100000E-020.337698E-03
0.146200E+050.730994E+000.179958E+020.179898E+02
0.179320E+020.337698E-03
733
0.731994E+000.100000E-020.328986E-03
0.146400E+050.731994E+000.179964E+020.179902E+02
0.179324E+020.328986E-03
734
0.732994E+000.100000E-020.311555E-03
0.146600E+050.732994E+000.179960E+020.179895E+02
0.179314E+020.311555E-03
735
0.733994E+000.100000E-020.288605E-03
0.146800E+050.733994E+000.179945E+020.179880E+02
0.179308E+020.288605E-03
736
0.734994E+000.100000E-020.235012E-03
0.147000E+050.734994E+000.179963E+020.179900E+02
0.179317E+020.235012E-03

737

0.735994E+000.100000E-020.192856E-03
0.147200E+050.735994E+000.179960E+020.179898E+02
0.179318E+020.192856E-03

738

0.736994E+000.100000E-020.408871E-03
0.147400E+050.736994E+000.179961E+020.179897E+02
0.179317E+020.408871E-03

739

0.737994E+000.100000E-020.333494E-03
0.147600E+050.737994E+000.179952E+020.179888E+02
0.179309E+020.333494E-03

740

0.738994E+000.100000E-020.258265E-03
0.147800E+050.738994E+000.179949E+020.179887E+02
0.179312E+020.258265E-03

741

0.739994E+000.100000E-020.243822E-03
0.148000E+050.739994E+000.179963E+020.179902E+02
0.179320E+020.243822E-03

742

0.740994E+000.100000E-020.192546E-03
0.148200E+050.740994E+000.179956E+020.179893E+02
0.179315E+020.192546E-03

743

0.741994E+000.100000E-020.226250E-03
0.148400E+050.741994E+000.179946E+020.179885E+02
0.179314E+020.226250E-03

744

0.742994E+000.100000E-020.298014E-03
0.148600E+050.742994E+000.179978E+020.179912E+02
0.179325E+020.298014E-03

745

0.743994E+000.100000E-020.197175E-03
0.148800E+050.743994E+000.179952E+020.179888E+02
0.179310E+020.197175E-03

746

0.744994E+000.100000E-020.197840E-03
0.149000E+050.744994E+000.179945E+020.179882E+02
0.179308E+020.197840E-03

747

0.745994E+000.100000E-020.132494E-03
0.149200E+050.745994E+000.179962E+020.179900E+02
0.179319E+020.132494E-03

748

0.746994E+000.100000E-020.153859E-03
0.149400E+050.746994E+000.179962E+020.179899E+02
0.179318E+020.153859E-03

749

0.747994E+000.100000E-020.133946E-03
0.149600E+050.747994E+000.179949E+020.179888E+02
0.179313E+020.133946E-03

750

0.748994E+000.100000E-020.154052E-03
0.149800E+050.748994E+000.179962E+020.179899E+02
0.179317E+020.154052E-03

TIM= 7.49E-01 DT= 1.00E-03 ISTEP=14999 DMAX= -2.972E-
01 I= 11 K= 3
FLOW IN= 5.715E-02 FLOW OUT= 5.715E-02 DSUM= 1.156E-
04

RESID(1)= 1.220E-04 RESID(2)= 1.048E-04 RESID(3)= 1.969E-01 RESID
(4)= 0.000E+00
RESID(5)= 2.411E-04 RESID(6)= 4.746E+01 RESID(7)= 2.107E-04 RESID
(8)= 0.000E+00

TIM= 7.49E-01 DT= 1.00E-03 ISTEP=14999 DMAX= -2.426E-01
 I= 11 K= 3
 FLOW IN= 5.715E-02 FLOW OUT= 5.715E-02 DSUM= 1.173E-04
 RESID(1)= 1.239E-04 RESID(2)= 8.839E-05 RESID(3)= 1.465E-01 RESID(4)= 0.000E+00
 RESID(5)= 2.282E-04 RESID(6)= 4.746E+01 RESID(7)= 2.375E-04 RESID(8)= 0.000E+00

TIM= 7.49E-01 DT= 1.00E-03 ISTEP=14999 DMAX= -2.426E-01
 I= 11 K= 3
 FLOW IN= 5.715E-02 FLOW OUT= 5.715E-02 DSUM= 1.173E-04
 RESID(1)= 1.239E-04 RESID(2)= 8.839E-05 RESID(3)= 1.465E-01 RESID(4)= 0.000E+00
 RESID(5)= 2.282E-04 RESID(6)= 4.746E+01 RESID(7)= 2.375E-04 RESID(8)= 0.000E+00

U VELOCITY
 X= 0.000E+00 1.500E-04 2.500E-04 3.500E-04 4.500E-04
 5.500E-04 6.500E-04 7.500E-04 8.500E-04 9.500E-04
 K= 2 3 4 5 6
 8 9 10 11
 I Y
 59 7.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
 00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
 58 7.200E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 57 7.000E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 56 6.800E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 55 6.600E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 54 6.400E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 53 6.200E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 52 6.000E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 51 5.800E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 50 5.600E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 49 5.400E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 48 5.200E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 47 4.900E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 46 4.600E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 45 4.400E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 44 4.200E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 43 4.000E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 42 3.800E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 41 3.600E-02 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01
 01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01 1.800E+01

13 4.246E-13 8.085E-13 3.082E-12 0.000E+00
5 6.000E-04 6.082E-19 5.285E-15 5.024E-14 1.064E-13 1.617E-
13 3.201E-13 6.135E-13 2.413E-12 0.000E+00
4 4.000E-04 1.343E-19 2.071E-15 2.402E-14 5.347E-14 8.252E-
14 1.725E-13 3.450E-13 1.531E-12 0.000E+00
3 2.000E-04 1.307E-22 5.228E-17 1.411E-15 3.982E-15 6.859E-
15 1.832E-14 4.549E-14 3.454E-13 0.000E+00
2 1.000E-04 2.180E-29 1.182E-20 2.202E-18 1.099E-17 2.503E-
17 1.193E-16 5.050E-16 1.339E-14 0.000E+00
1 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00

PROPANE

0 X= 0.000E+00 1.000E-04 2.000E-04 3.000E-04 4.000E-
04 5.000E-04 6.000E-04 7.000E-04 8.000E-04 9.000E-04
0 K= 1 2 3 4 5
6 7 8 9 10
I Y
59 7.600E-02 0.000E+00 1.000E-10 1.000E-10 1.000E-10 1.000E-
10 1.000E-10 1.000E-10 1.000E-10 1.000E-10 1.000E-10
58 7.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
57 7.000E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
56 6.800E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
55 6.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
54 6.400E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
53 6.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
52 6.000E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
51 5.800E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
50 5.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
49 5.400E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
48 5.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
47 4.900E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
46 4.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
45 4.400E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
44 4.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
43 4.000E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
42 3.800E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
41 3.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
40 3.400E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
39 3.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
38 3.000E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
37 2.800E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
36 2.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00

31	1.850E-02	4.896E-02	4.826E-02	4.759E-02	4.694E-02	4.632E-
02	4.572E-02	4.514E-02	4.458E-02	4.403E-02	4.350E-02	
30	1.800E-02	7.221E-02	7.122E-02	7.026E-02	6.932E-02	6.840E-
02	6.751E-02	6.663E-02	6.577E-02	6.492E-02	6.407E-02	
29	1.700E-02	1.001E-01	9.921E-02	9.831E-02	9.747E-02	9.668E-
02	9.589E-02	9.511E-02	9.432E-02	9.351E-02	9.268E-02	
28	1.600E-02	1.104E-01	1.096E-01	1.088E-01	1.080E-01	1.073E-
01	1.066E-01	1.059E-01	1.053E-01	1.047E-01	1.040E-01	
27	1.500E-02	1.172E-01	1.163E-01	1.154E-01	1.144E-01	1.135E-
01	1.126E-01	1.118E-01	1.110E-01	1.102E-01	1.095E-01	
26	1.400E-02	1.235E-01	1.225E-01	1.216E-01	1.206E-01	1.197E-
01	1.188E-01	1.179E-01	1.171E-01	1.162E-01	1.152E-01	
25	1.300E-02	1.311E-01	1.301E-01	1.290E-01	1.280E-01	1.270E-
01	1.260E-01	1.250E-01	1.240E-01	1.230E-01	1.220E-01	
24	1.200E-02	1.403E-01	1.393E-01	1.382E-01	1.372E-01	1.361E-
01	1.350E-01	1.338E-01	1.327E-01	1.315E-01	1.304E-01	
23	1.100E-02	1.525E-01	1.516E-01	1.506E-01	1.495E-01	1.484E-
01	1.473E-01	1.462E-01	1.450E-01	1.438E-01	1.425E-01	
22	1.000E-02	1.693E-01	1.685E-01	1.677E-01	1.669E-01	1.660E-
01	1.650E-01	1.641E-01	1.631E-01	1.620E-01	1.609E-01	
21	9.000E-03	1.892E-01	1.887E-01	1.881E-01	1.875E-01	1.869E-
01	1.861E-01	1.854E-01	1.846E-01	1.838E-01	1.829E-01	
20	8.000E-03	2.128E-01	2.124E-01	2.120E-01	2.116E-01	2.110E-
01	2.105E-01	2.099E-01	2.093E-01	2.086E-01	2.078E-01	
19	6.700E-03	2.493E-01	2.493E-01	2.492E-01	2.491E-01	2.490E-
01	2.488E-01	2.485E-01	2.482E-01	2.479E-01	2.475E-01	
18	5.500E-03	2.866E-01	2.872E-01	2.878E-01	2.883E-01	2.888E-
01	2.893E-01	2.897E-01	2.901E-01	2.904E-01	2.907E-01	
17	4.500E-03	3.565E-01	3.592E-01	3.619E-01	3.644E-01	3.668E-
01	3.691E-01	3.712E-01	3.733E-01	3.753E-01	3.772E-01	
16	3.700E-03	4.470E-01	4.521E-01	4.570E-01	4.615E-01	4.659E-
01	4.700E-01	4.738E-01	4.773E-01	4.807E-01	4.838E-01	
15	3.100E-03	5.559E-01	5.613E-01	5.664E-01	5.712E-01	5.757E-
01	5.799E-01	5.838E-01	5.873E-01	5.907E-01	5.938E-01	
14	2.600E-03	6.697E-01	6.749E-01	6.796E-01	6.840E-01	6.879E-
01	6.914E-01	6.947E-01	6.977E-01	7.004E-01	7.029E-01	
13	2.200E-03	7.794E-01	7.829E-01	7.860E-01	7.887E-01	7.912E-
01	7.934E-01	7.954E-01	7.971E-01	7.988E-01	8.002E-01	
12	1.900E-03	8.712E-01	8.719E-01	8.726E-01	8.733E-01	8.738E-
01	8.744E-01	8.748E-01	8.752E-01	8.756E-01	8.759E-01	
11	1.700E-03	9.307E-01	9.296E-01	9.287E-01	9.279E-01	9.272E-
01	9.265E-01	9.259E-01	9.254E-01	9.248E-01	9.243E-01	
10	1.500E-03	9.784E-01	9.766E-01	9.749E-01	9.733E-01	9.719E-
01	9.705E-01	9.692E-01	9.679E-01	9.668E-01	9.656E-01	
9	1.400E-03	9.904E-01	9.890E-01	9.876E-01	9.863E-01	9.850E-
01	9.837E-01	9.825E-01	9.813E-01	9.802E-01	9.791E-01	
8	1.200E-03	9.982E-01	9.978E-01	9.973E-01	9.968E-01	9.963E-
01	9.958E-01	9.952E-01	9.946E-01	9.940E-01	9.934E-01	
7	1.000E-03	9.997E-01	9.996E-01	9.995E-01	9.994E-01	9.992E-
01	9.991E-01	9.989E-01	9.987E-01	9.985E-01	9.983E-01	
6	8.000E-04	1.000E+00	9.999E-01	9.999E-01	9.999E-01	9.999E-
01	9.998E-01	9.998E-01	9.997E-01	9.997E-01	9.996E-01	
5	6.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+
00	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-01	
4	4.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+
00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
3	2.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+
00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
2	1.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+
00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
1	0.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+
00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
0	X=	2.000E-03	2.200E-03	2.400E-03	2.600E-03	2.800E-
03	3.000E-03	3.300E-03	3.600E-03	3.900E-03	4.200E-03	
0	K=	21	22	23	24	25
26	27	28	29	30		

02	9.247E-02	8.850E-02	8.757E-02	8.674E-02	0.000E+00		
26	1.400E-02	1.105E-01	1.056E-01	1.037E-01	1.018E-01	1.001E-	
01	9.581E-02	9.118E-02	8.913E-02	8.773E-02	8.684E-02		
25	1.300E-02	1.177E-01	1.132E-01	1.108E-01	1.085E-01	1.063E-	
01	1.019E-01	9.692E-02	9.437E-02	9.216E-02	9.067E-02		
24	1.200E-02	1.263E-01	1.217E-01	1.193E-01	1.169E-01	1.142E-	
01	1.096E-01	1.042E-01	1.009E-01	9.796E-02	9.535E-02		
23	1.100E-02	1.388E-01	1.341E-01	1.314E-01	1.288E-01	1.261E-	
01	1.219E-01	1.165E-01	1.123E-01	1.084E-01	1.049E-01		
22	1.000E-02	1.577E-01	1.536E-01	1.512E-01	1.488E-01	1.463E-	
01	1.423E-01	1.373E-01	1.336E-01	1.300E-01	1.265E-01		
21	9.000E-03	1.802E-01	1.768E-01	1.746E-01	1.723E-01	1.701E-	
01	1.666E-01	1.619E-01	1.584E-01	1.549E-01	1.516E-01		
20	8.000E-03	2.060E-01	2.033E-01	2.014E-01	1.994E-01	1.973E-	
01	1.944E-01	1.903E-01	1.869E-01	1.836E-01	1.804E-01		
19	6.700E-03	2.470E-01	2.459E-01	2.447E-01	2.433E-01	2.419E-	
01	2.402E-01	2.375E-01	2.347E-01	2.319E-01	2.291E-01		
18	5.500E-03	2.917E-01	2.927E-01	2.928E-01	2.926E-01	2.923E-	
01	2.923E-01	2.917E-01	2.903E-01	2.888E-01	2.868E-01		
17	4.500E-03	3.789E-01	3.822E-01	3.848E-01	3.870E-01	3.891E-	
01	3.904E-01	3.953E-01	3.930E-01	3.943E-01	3.933E-01		
16	3.700E-03	4.868E-01	4.921E-01	4.971E-01	5.008E-01	5.081E-	
01	5.072E-01	5.128E-01	5.137E-01	5.170E-01	5.177E-01		
15	3.100E-03	5.966E-01	6.018E-01	6.063E-01	6.102E-01	6.135E-	
01	6.163E-01	6.198E-01	6.227E-01	6.250E-01	6.269E-01		
14	2.600E-03	7.052E-01	7.092E-01	7.126E-01	7.155E-01	7.179E-	
01	7.200E-01	7.225E-01	7.246E-01	7.262E-01	7.276E-01		
13	2.200E-03	8.015E-01	8.037E-01	8.055E-01	8.069E-01	8.081E-	
01	8.091E-01	8.102E-01	8.109E-01	8.115E-01	8.119E-01		
12	1.900E-03	8.761E-01	8.764E-01	8.766E-01	8.766E-01	8.766E-	
01	8.764E-01	8.760E-01	8.755E-01	8.750E-01	8.744E-01		
11	1.700E-03	9.236E-01	9.226E-01	9.216E-01	9.206E-01	9.197E-	
01	9.185E-01	9.172E-01	9.158E-01	9.145E-01	9.132E-01		
10	1.500E-03	9.641E-01	9.621E-01	9.602E-01	9.585E-01	9.568E-	
01	9.549E-01	9.527E-01	9.506E-01	9.487E-01	9.468E-01		
9	1.400E-03	9.775E-01	9.755E-01	9.737E-01	9.719E-01	9.702E-	
01	9.682E-01	9.660E-01	9.639E-01	9.618E-01	9.599E-01		
8	1.200E-03	9.925E-01	9.913E-01	9.901E-01	9.889E-01	9.876E-	
01	9.861E-01	9.844E-01	9.826E-01	9.809E-01	9.792E-01		
7	1.000E-03	9.979E-01	9.974E-01	9.968E-01	9.962E-01	9.955E-	
01	9.947E-01	9.936E-01	9.925E-01	9.914E-01	9.902E-01		
6	8.000E-04	9.995E-01	9.993E-01	9.991E-01	9.988E-01	9.986E-	
01	9.982E-01	9.976E-01	9.971E-01	9.964E-01	9.958E-01		
5	6.000E-04	9.999E-01	9.998E-01	9.998E-01	9.997E-01	9.996E-	
01	9.994E-01	9.992E-01	9.989E-01	9.986E-01	9.983E-01		
4	4.000E-04	1.000E+00	1.000E+00	9.999E-01	9.999E-01	9.999E-	
01	9.998E-01	9.997E-01	9.996E-01	9.995E-01	9.993E-01		
3	2.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+	
00	9.999E-01	9.999E-01	9.998E-01	9.998E-01	9.997E-01		
2	1.000E-04	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+	
00	1.000E+00	9.999E-01	9.999E-01	9.998E-01	9.998E-01		
1	0.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+	
00	9.999E-01	9.999E-01	9.999E-01	9.998E-01	9.997E-01		
0		X=	4.500E-03	4.800E-03	5.200E-03	5.600E-03	6.000E-
03	6.500E-03	7.000E-03	7.500E-03	8.000E-03	8.500E-03		
0		K=	31	32	33	34	35
36			37	38	39	40	
I		Y					
59	7.600E-02	1.000E-10	1.000E-10	1.000E-10	1.000E-10	1.000E-	
10	1.000E-10	1.000E-10	1.000E-10	1.000E-10	1.000E-10		
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
57	7.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
56	6.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		

22	1.000E-02	1.232E-01	1.189E-01	1.135E-01	1.093E-01	1.046E-
01	9.945E-02	9.579E-02	9.302E-02	9.023E-02	8.744E-02	
21	9.000E-03	1.483E-01	1.441E-01	1.391E-01	1.351E-01	1.305E-
01	1.254E-01	1.215E-01	1.179E-01	1.147E-01	1.119E-01	
20	8.000E-03	1.773E-01	1.734E-01	1.686E-01	1.647E-01	1.602E-
01	1.551E-01	1.511E-01	1.476E-01	1.443E-01	1.412E-01	
19	6.700E-03	2.262E-01	2.231E-01	2.189E-01	2.150E-01	2.109E-
01	2.060E-01	2.016E-01	1.976E-01	1.938E-01	1.901E-01	
18	5.500E-03	2.848E-01	2.829E-01	2.800E-01	2.767E-01	2.734E-
01	2.691E-01	2.647E-01	2.605E-01	2.565E-01	2.524E-01	
17	4.500E-03	3.929E-01	3.922E-01	3.908E-01	3.889E-01	3.866E-
01	3.833E-01	3.796E-01	3.758E-01	3.718E-01	3.676E-01	
16	3.700E-03	5.190E-01	5.229E-01	5.206E-01	5.235E-01	5.205E-
01	5.197E-01	5.224E-01	5.171E-01	5.155E-01	5.135E-01	
15	3.100E-03	6.285E-01	6.297E-01	6.310E-01	6.318E-01	6.323E-
01	6.324E-01	6.322E-01	6.319E-01	6.314E-01	6.306E-01	
14	2.600E-03	7.287E-01	7.295E-01	7.304E-01	7.310E-01	7.314E-
01	7.315E-01	7.313E-01	7.312E-01	7.310E-01	7.305E-01	
13	2.200E-03	8.121E-01	8.122E-01	8.123E-01	8.121E-01	8.119E-
01	8.113E-01	8.106E-01	8.100E-01	8.094E-01	8.087E-01	
12	1.900E-03	8.738E-01	8.730E-01	8.721E-01	8.711E-01	8.700E-
01	8.687E-01	8.674E-01	8.661E-01	8.648E-01	8.636E-01	
11	1.700E-03	9.120E-01	9.105E-01	9.089E-01	9.074E-01	9.057E-
01	9.037E-01	9.018E-01	9.000E-01	8.983E-01	8.966E-01	
10	1.500E-03	9.451E-01	9.431E-01	9.409E-01	9.388E-01	9.366E-
01	9.342E-01	9.319E-01	9.297E-01	9.276E-01	9.255E-01	
9	1.400E-03	9.580E-01	9.560E-01	9.537E-01	9.516E-01	9.493E-
01	9.468E-01	9.444E-01	9.421E-01	9.399E-01	9.377E-01	
8	1.200E-03	9.776E-01	9.757E-01	9.736E-01	9.716E-01	9.694E-
01	9.670E-01	9.647E-01	9.624E-01	9.602E-01	9.581E-01	
7	1.000E-03	9.890E-01	9.877E-01	9.861E-01	9.845E-01	9.827E-
01	9.807E-01	9.787E-01	9.767E-01	9.748E-01	9.728E-01	
6	8.000E-04	9.950E-01	9.942E-01	9.931E-01	9.920E-01	9.907E-
01	9.892E-01	9.877E-01	9.861E-01	9.846E-01	9.830E-01	
5	6.000E-04	9.979E-01	9.974E-01	9.967E-01	9.960E-01	9.952E-
01	9.942E-01	9.931E-01	9.919E-01	9.907E-01	9.894E-01	
4	4.000E-04	9.991E-01	9.988E-01	9.985E-01	9.980E-01	9.975E-
01	9.968E-01	9.960E-01	9.952E-01	9.942E-01	9.932E-01	
3	2.000E-04	9.996E-01	9.994E-01	9.992E-01	9.989E-01	9.985E-
01	9.980E-01	9.975E-01	9.968E-01	9.961E-01	9.953E-01	
2	1.000E-04	9.997E-01	9.995E-01	9.994E-01	9.991E-01	9.988E-
01	9.983E-01	9.978E-01	9.972E-01	9.965E-01	9.957E-01	
1	0.000E+00	9.996E-01	9.994E-01	9.991E-01	9.988E-01	9.983E-
01	9.977E-01	9.970E-01	9.961E-01	9.952E-01	9.941E-01	
0	X=	9.000E-03	9.500E-03	1.000E-02	1.500E-02	2.000E-
02	3.000E-02	4.000E-02	5.500E-02	6.000E-02	7.500E-02	
0	K=	41	42	43	44	45
46	47	48	49	50		
I	Y					
59	7.600E-02	1.000E-10	1.000E-10	1.000E-10	1.000E-10	1.000E-
10	1.000E-10	1.000E-10	1.000E-10	1.000E-10	1.000E-10	
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
57	7.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
56	6.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
55	6.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
54	6.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
53	6.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
52	6.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
51	5.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+

00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
50	5.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
49	5.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
48	5.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
47	4.900E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
46	4.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
45	4.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
44	4.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
43	4.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
42	3.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
41	3.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
40	3.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
39	3.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
38	3.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
37	2.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
36	2.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
35	2.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
34	2.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
33	2.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
32	1.950E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
31	1.850E-02	1.965E-02	1.850E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
30	1.800E-02	2.628E-02	2.469E-02	1.952E-02	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
29	1.700E-02	3.647E-02	3.365E-02	2.703E-02	1.918E-02	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
28	1.600E-02	4.175E-02	3.859E-02	3.207E-02	2.234E-02	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
27	1.500E-02	0.000E+00	4.334E-02	3.619E-02	2.495E-02	1.868E-	1.868E-
02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
26	1.400E-02	0.000E+00	0.000E+00	0.000E+00	2.752E-02	2.093E-	2.093E-
02	1.667E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
25	1.300E-02	0.000E+00	5.257E-02	0.000E+00	3.183E-02	2.444E-	2.444E-
02	2.013E-02	1.803E-02	1.731E-02	1.587E-02	1.506E-02	0.000E+00	0.000E+
24	1.200E-02	0.000E+00	5.711E-02	0.000E+00	3.944E-02	3.101E-	3.101E-
02	2.569E-02	2.275E-02	2.128E-02	1.921E-02	1.798E-02	0.000E+00	0.000E+
23	1.100E-02	0.000E+00	6.397E-02	0.000E+00	4.844E-02	4.051E-	4.051E-
02	3.383E-02	2.915E-02	2.656E-02	2.371E-02	2.149E-02	0.000E+00	0.000E+
22	1.000E-02	8.463E-02	8.188E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
21	9.000E-03	1.093E-01	1.065E-01	1.024E-01	8.342E-02	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
20	8.000E-03	1.383E-01	1.352E-01	1.278E-01	1.064E-01	9.275E-	9.275E-
02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
19	6.700E-03	1.865E-01	1.829E-01	1.749E-01	1.521E-01	1.350E-	1.350E-
01	1.306E-01	1.158E-01	9.786E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+
18	5.500E-03	2.485E-01	2.445E-01	2.403E-01	2.192E-01	1.987E-	1.987E-

01	1.902E-01	1.676E-01	1.367E-01	1.198E-01	1.042E-01		
17	4.500E-03	3.632E-01	3.585E-01	3.530E-01	2.936E-01	2.666E-	
01	2.549E-01	2.212E-01	1.849E-01	1.580E-01	1.417E-01		
16	3.700E-03	5.110E-01	5.083E-01	5.014E-01	4.322E-01	3.880E-	
01	3.180E-01	2.701E-01	2.319E-01	1.968E-01	1.756E-01		
15	3.100E-03	6.292E-01	6.264E-01	6.200E-01	5.703E-01	5.232E-	
01	4.334E-01	3.520E-01	2.731E-01	2.298E-01	2.037E-01		
14	2.600E-03	7.298E-01	7.279E-01	7.197E-01	6.819E-01	6.338E-	
01	5.468E-01	4.511E-01	3.135E-01	2.616E-01	2.298E-01		
13	2.200E-03	8.079E-01	8.068E-01	7.965E-01	7.646E-01	7.166E-	
01	6.328E-01	5.282E-01	3.907E-01	2.892E-01	2.526E-01		
12	1.900E-03	8.623E-01	8.610E-01	8.497E-01	8.205E-01	7.732E-	
01	6.921E-01	5.833E-01	4.507E-01	3.114E-01	2.706E-01		
11	1.700E-03	8.950E-01	8.934E-01	8.815E-01	8.537E-01	8.072E-	
01	7.281E-01	6.179E-01	4.880E-01	3.576E-01	2.828E-01		
10	1.500E-03	9.236E-01	9.216E-01	9.095E-01	8.830E-01	8.377E-	
01	7.608E-01	6.502E-01	5.230E-01	3.933E-01	2.956E-01		
9	1.400E-03	9.356E-01	9.336E-01	9.216E-01	8.959E-01	8.514E-	
01	7.757E-01	6.652E-01	5.393E-01	4.105E-01	3.020E-01		
8	1.200E-03	9.560E-01	9.539E-01	9.423E-01	9.182E-01	8.756E-	
01	8.024E-01	6.925E-01	5.695E-01	4.421E-01	3.143E-01		
7	1.000E-03	9.709E-01	9.690E-01	9.582E-01	9.358E-01	8.953E-	
01	8.246E-01	7.158E-01	5.954E-01	4.690E-01	3.511E-01		
6	8.000E-04	9.813E-01	9.797E-01	9.699E-01	9.493E-01	9.107E-	
01	8.424E-01	7.349E-01	6.165E-01	4.900E-01	3.642E-01		
5	6.000E-04	9.881E-01	9.867E-01	9.781E-01	9.590E-01	9.222E-	
01	8.559E-01	7.495E-01	6.329E-01	5.066E-01	3.805E-01		
4	4.000E-04	9.922E-01	9.911E-01	9.835E-01	9.656E-01	9.301E-	
01	8.653E-01	7.599E-01	6.445E-01	5.187E-01	3.927E-01		
3	2.000E-04	9.944E-01	9.934E-01	9.864E-01	9.694E-01	9.348E-	
01	8.709E-01	7.661E-01	6.513E-01	5.260E-01	4.002E-01		
2	1.000E-04	9.949E-01	9.940E-01	9.872E-01	9.703E-01	9.359E-	
01	8.722E-01	7.676E-01	6.530E-01	5.277E-01	4.021E-01		
1	0.000E+00	9.930E-01	9.917E-01	9.823E-01	9.594E-01	9.138E-	
01	8.334E-01	7.116E-01	5.912E-01	4.726E-01	3.657E-01		
0		X=	8.000E-02	9.500E-02	1.100E-01	1.250E-01	1.350E-
01	1.450E-01	1.550E-01	1.650E-01	1.750E-01			
0		K=	51	52	53	54	55
56		57	58	59			

I	Y						
59	7.600E-02	1.000E-10	1.000E-10	1.000E-10	1.000E-10	1.000E-	
10	1.000E-10	1.000E-10	1.000E-10	1.000E-10			
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
57	7.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
56	6.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
55	6.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
54	6.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
53	6.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
52	6.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
51	5.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
50	5.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
49	5.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.000E-10			
48	5.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.519E-10			
47	4.900E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	1.319E-09			

46	4.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.927E-09		
45	4.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.629E-08		
44	4.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.322E-07		
43	4.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.633E-07		
42	3.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.566E-06		
41	3.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.083E-06		
40	3.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.574E-05		
39	3.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.616E-05		
38	3.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.269E-04		
37	2.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E-04		
36	2.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.483E-04		
35	2.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.562E-03		
34	2.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.995E-03		
33	2.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.430E-03		
32	1.950E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.273E-03		
31	1.850E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.272E-03		
30	1.800E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.446E-03		
29	1.700E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.217E-02		
28	1.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.541E-02		
27	1.500E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	1.145E-02	9.150E-03	1.919E-02			
26	1.400E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.349E-02	1.441E-
02	1.445E-02	1.360E-02	1.132E-02	2.358E-02			
25	1.300E-02	1.469E-02	1.448E-02	1.555E-02	1.634E-02	1.709E-	
02	1.733E-02	1.627E-02	1.413E-02	2.859E-02			
24	1.200E-02	1.746E-02	1.713E-02	1.841E-02	1.924E-02	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	3.425E-02			
23	1.100E-02	2.118E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	4.041E-02			
22	1.000E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	4.710E-02			
21	9.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	5.457E-02			
20	8.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	6.313E-02			
19	6.700E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	7.632E-02			
18	5.500E-03	1.035E-01	1.015E-01	9.557E-02	9.019E-02	8.666E-	
02	7.904E-02	0.000E+00	0.000E+00	9.038E-02			
17	4.500E-03	1.366E-01	1.310E-01	1.233E-01	1.165E-01	1.121E-	
01	1.056E-01	9.360E-02	6.622E-02	1.022E-01			
16	3.700E-03	1.657E-01	1.547E-01	1.432E-01	1.336E-01	1.270E-	
01	1.198E-01	1.085E-01	8.331E-02	1.105E-01			
15	3.100E-03	1.896E-01	1.733E-01	1.580E-01	1.460E-01	1.376E-	
01	1.295E-01	1.196E-01	9.585E-02	1.164E-01			
14	2.600E-03	2.109E-01	1.892E-01	1.700E-01	1.558E-01	1.459E-	
01	1.369E-01	1.269E-01	1.049E-01	1.209E-01			

10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
50	5.600E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
49	5.400E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
48	5.200E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
47	4.900E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
46	4.600E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
45	4.400E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
44	4.200E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
43	4.000E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
42	3.800E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
41	3.600E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
40	3.400E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
39	3.200E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
38	3.000E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
37	2.800E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
36	2.600E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
35	2.400E-02	0.000E+00	3.569E-10	3.569E-10	3.569E-10	1.051E-	
09	2.694E-09	5.244E-09	9.043E-09	1.425E-08	2.118E-08		
34	2.200E-02	0.000E+00	3.569E-10	8.300E-08	2.307E-07	4.840E-	
07	8.646E-07	1.390E-06	2.076E-06	2.934E-06	3.972E-06		
33	2.000E-02	0.000E+00	3.569E-10	2.974E-05	7.099E-05	1.275E-	
04	1.973E-04	2.788E-04	3.710E-04	4.729E-04	5.837E-04		
32	1.950E-02	0.000E+00	3.569E-10	1.840E-03	3.332E-03	4.734E-	
03	6.028E-03	7.233E-03	8.361E-03	9.415E-03	1.041E-02		
31	1.850E-02	0.000E+00	5.920E-05	5.201E-06	2.913E-06	1.819E-	
06	1.248E-06	9.196E-07	7.165E-07	5.799E-07	4.892E-07		
30	1.800E-02	0.000E+00	1.882E-04	1.922E-05	3.407E-05	5.103E-	
05	6.624E-05	7.719E-05	8.306E-05	1.997E-01	8.366E-05		
29	1.700E-02	0.000E+00	6.035E-03	2.584E-03	2.997E-03	3.460E-	
03	3.906E-03	4.295E-03	4.599E-03	4.802E-03	4.909E-03		
28	1.600E-02	0.000E+00	2.032E-02	1.333E-02	1.410E-02	1.493E-	
02	1.573E-02	1.643E-02	1.697E-02	1.734E-02	1.751E-02		
27	1.500E-02	0.000E+00	2.902E-02	2.112E-02	2.212E-02	2.314E-	
02	2.416E-02	2.509E-02	2.589E-02	2.652E-02	2.696E-02		
26	1.400E-02	0.000E+00	3.072E-02	2.264E-02	2.389E-02	2.517E-	
02	2.641E-02	2.755E-02	2.856E-02	2.940E-02	3.003E-02		
25	1.300E-02	0.000E+00	3.062E-02	2.210E-02	2.342E-02	2.473E-	
02	2.595E-02	2.704E-02	2.796E-02	2.868E-02	2.918E-02		
24	1.200E-02	0.000E+00	3.345E-02	2.394E-02	2.482E-02	2.565E-	
02	2.636E-02	2.693E-02	2.734E-02	2.757E-02	2.761E-02		
23	1.100E-02	0.000E+00	3.723E-02	2.660E-02	2.687E-02	2.710E-	
02	2.725E-02	2.731E-02	2.726E-02	2.708E-02	2.678E-02		
22	1.000E-02	0.000E+00	3.739E-02	2.608E-02	2.684E-02	2.752E-	
02	2.810E-02	2.851E-02	2.880E-02	2.889E-02	2.884E-02		
21	9.000E-03	0.000E+00	4.759E-02	3.535E-02	3.522E-02	3.519E-	
02	3.518E-02	3.514E-02	3.505E-02	3.488E-02	3.461E-02		
20	8.000E-03	0.000E+00	5.317E-02	4.087E-02	4.038E-02	4.003E-	
02	3.978E-02	3.958E-02	3.937E-02	3.913E-02	3.883E-02		
19	6.700E-03	0.000E+00	4.331E-02	3.215E-02	3.183E-02	3.176E-	
02	3.184E-02	3.198E-02	3.214E-02	3.227E-02	3.235E-02		
18	5.500E-03	0.000E+00	1.753E-02	1.048E-02	1.086E-02	1.143E-	

46	4.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
45	4.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
44	4.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
43	4.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
42	3.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
41	3.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
40	3.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
39	3.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
38	3.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
37	2.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
36	2.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
35	2.400E-02	3.011E-08	4.133E-08	5.511E-08	7.174E-08	9.147E-08	9.147E-08
08	1.146E-07	1.412E-07	1.718E-07	2.068E-07	2.478E-07	2.478E-07	2.478E-07
34	2.200E-02	5.199E-06	6.620E-06	8.237E-06	1.006E-05	1.208E-05	1.208E-05
05	1.430E-05	1.673E-05	1.936E-05	2.222E-05	2.540E-05	2.540E-05	2.540E-05
33	2.000E-02	7.024E-04	8.287E-04	9.614E-04	1.101E-03	1.245E-03	1.245E-03
03	1.396E-03	1.550E-03	1.710E-03	1.873E-03	2.047E-03	2.047E-03	2.047E-03
32	1.950E-02	1.134E-02	1.222E-02	1.305E-02	1.384E-02	1.458E-02	1.458E-02
02	1.528E-02	1.594E-02	1.657E-02	1.716E-02	1.775E-02	1.775E-02	1.775E-02
31	1.850E-02	4.215E-07	3.720E-07	3.342E-07	3.039E-07	2.779E-07	2.779E-07
07	2.535E-07	2.279E-07	1.985E-07	1.628E-07	1.207E-07	1.207E-07	1.207E-07
30	1.800E-02	8.113E-05	7.665E-05	7.082E-05	6.401E-05	5.642E-05	5.642E-05
05	4.822E-05	3.956E-05	3.071E-05	2.213E-05	1.443E-05	1.443E-05	1.443E-05
29	1.700E-02	4.907E-03	4.800E-03	4.598E-03	4.318E-03	3.977E-03	3.977E-03
03	3.585E-03	3.157E-03	2.714E-03	2.274E-03	1.853E-03	1.853E-03	1.853E-03
28	1.600E-02	1.747E-02	1.722E-02	1.678E-02	1.616E-02	1.537E-02	1.537E-02
02	1.446E-02	1.343E-02	1.234E-02	1.120E-02	1.006E-02	1.006E-02	1.006E-02
27	1.500E-02	2.719E-02	2.721E-02	2.702E-02	2.663E-02	2.604E-02	2.604E-02
02	2.526E-02	2.430E-02	2.319E-02	2.195E-02	2.059E-02	2.059E-02	2.059E-02
26	1.400E-02	3.045E-02	3.065E-02	3.063E-02	3.038E-02	2.991E-02	2.991E-02
02	2.923E-02	2.836E-02	2.730E-02	2.609E-02	2.477E-02	2.477E-02	2.477E-02
25	1.300E-02	2.946E-02	2.950E-02	2.931E-02	2.890E-02	2.827E-02	2.827E-02
02	2.745E-02	2.643E-02	2.526E-02	2.395E-02	2.252E-02	2.252E-02	2.252E-02
24	1.200E-02	2.746E-02	2.712E-02	2.659E-02	2.589E-02	2.503E-02	2.503E-02
02	2.401E-02	2.287E-02	2.161E-02	2.027E-02	1.886E-02	1.886E-02	1.886E-02
23	1.100E-02	2.634E-02	2.576E-02	2.506E-02	2.424E-02	2.331E-02	2.331E-02
02	2.228E-02	2.117E-02	1.998E-02	1.875E-02	1.748E-02	1.748E-02	1.748E-02
22	1.000E-02	2.862E-02	2.824E-02	2.771E-02	2.704E-02	2.626E-02	2.626E-02
02	2.537E-02	2.440E-02	2.336E-02	2.226E-02	2.112E-02	2.112E-02	2.112E-02
21	9.000E-03	3.425E-02	3.378E-02	3.321E-02	3.254E-02	3.178E-02	3.178E-02
02	3.094E-02	3.002E-02	2.903E-02	2.799E-02	2.690E-02	2.690E-02	2.690E-02
20	8.000E-03	3.847E-02	3.803E-02	3.752E-02	3.694E-02	3.628E-02	3.628E-02
02	3.554E-02	3.474E-02	3.387E-02	3.294E-02	3.196E-02	3.196E-02	3.196E-02
19	6.700E-03	3.237E-02	3.232E-02	3.219E-02	3.199E-02	3.169E-02	3.169E-02
02	3.132E-02	3.086E-02	3.033E-02	2.972E-02	2.905E-02	2.905E-02	2.905E-02
18	5.500E-03	1.507E-02	1.548E-02	1.581E-02	1.604E-02	1.618E-02	1.618E-02
02	1.623E-02	1.619E-02	1.605E-02	1.583E-02	1.552E-02	1.552E-02	1.552E-02
17	4.500E-03	1.248E-01	1.242E-01	1.237E-01	1.232E-01	1.228E-01	1.228E-01
01	1.223E-01	1.219E-01	1.215E-01	1.211E-01	1.208E-01	1.208E-01	1.208E-01
16	3.700E-03	1.072E-01	1.062E-01	1.053E-01	1.044E-01	1.036E-01	1.036E-01
01	1.028E-01	1.020E-01	1.013E-01	1.007E-01	1.001E-01	1.001E-01	1.001E-01
15	3.100E-03	8.612E-02	8.506E-02	8.407E-02	8.315E-02	8.228E-02	8.228E-02
02	8.147E-02	8.071E-02	8.001E-02	7.937E-02	7.877E-02	7.877E-02	7.877E-02
14	2.600E-03	6.404E-02	6.304E-02	6.212E-02	6.128E-02	6.051E-02	6.051E-02
02	5.983E-02	5.920E-02	5.862E-02	5.809E-02	5.761E-02	5.761E-02	5.761E-02

13	2.200E-03	4.277E-02	4.209E-02	4.149E-02	4.096E-02	4.049E-02
02	4.006E-02	3.968E-02	3.933E-02	3.902E-02	3.874E-02	3.846E-02
12	1.900E-03	2.498E-02	2.483E-02	2.470E-02	2.457E-02	2.446E-02
02	2.436E-02	2.427E-02	2.419E-02	2.413E-02	2.407E-02	2.401E-02
11	1.700E-03	1.343E-02	1.365E-02	1.383E-02	1.399E-02	1.412E-02
02	1.425E-02	1.436E-02	1.447E-02	1.458E-02	1.468E-02	1.478E-02
10	1.500E-03	4.189E-03	4.539E-03	4.865E-03	5.170E-03	5.455E-03
03	5.724E-03	5.978E-03	6.218E-03	6.447E-03	6.665E-03	6.883E-03
9	1.400E-03	1.870E-03	2.139E-03	2.404E-03	2.662E-03	2.912E-03
03	3.155E-03	3.389E-03	3.618E-03	3.841E-03	4.057E-03	4.273E-03
8	1.200E-03	3.462E-04	4.294E-04	5.192E-04	6.149E-04	7.156E-04
04	8.205E-04	9.291E-04	1.041E-03	1.154E-03	1.270E-03	1.387E-03
7	1.000E-03	5.425E-05	7.253E-05	9.401E-05	1.187E-04	1.467E-04
04	1.779E-04	2.123E-04	2.498E-04	2.902E-04	3.334E-04	3.796E-04
6	8.000E-04	7.672E-06	1.098E-05	1.519E-05	2.038E-05	2.665E-05
05	3.410E-05	4.280E-05	5.281E-05	6.419E-05	7.698E-05	9.127E-05
5	6.000E-04	1.064E-06	1.610E-06	2.339E-06	3.303E-06	4.536E-06
06	6.079E-06	7.999E-06	1.031E-05	1.308E-05	1.636E-05	2.014E-05
4	4.000E-04	2.091E-07	2.846E-07	4.020E-07	5.697E-07	7.961E-07
07	1.098E-06	1.492E-06	1.987E-06	2.624E-06	3.404E-06	4.333E-06
3	2.000E-04	1.001E-07	1.169E-07	1.420E-07	1.672E-07	1.924E-07
07	3.014E-07	3.852E-07	5.026E-07	6.619E-07	8.632E-07	1.104E-06
2	1.000E-04	7.496E-08	8.334E-08	1.001E-07	1.169E-07	1.347E-07
07	1.756E-07	2.259E-07	2.846E-07	3.768E-07	4.775E-07	5.856E-07
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0		X=	2.000E-03	2.200E-03	2.400E-03	2.600E-03
03	3.000E-03	3.300E-03	3.600E-03	3.900E-03	4.200E-03	4.500E-03
0		K=	21	22	23	24
26	27	28	29	30		25
I	Y					
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
58	7.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
57	7.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
56	6.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
55	6.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
54	6.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
53	6.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
52	6.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
51	5.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
50	5.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
49	5.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
48	5.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
47	4.900E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
46	4.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
45	4.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
44	4.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
43	4.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
42	3.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10

10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
41	3.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
40	3.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
39	3.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
38	3.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
37	2.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	
36	2.600E-02	6.443E-10	1.910E-09	3.537E-09	5.554E-09	8.091E-	8.091E-
09	1.209E-08	1.826E-08	2.595E-08	3.528E-08	4.635E-08		
35	2.400E-02	3.023E-07	4.098E-07	5.381E-07	6.881E-07	8.605E-	8.605E-
07	1.115E-06	1.476E-06	1.892E-06	2.360E-06	2.878E-06		
34	2.200E-02	2.944E-05	3.674E-05	4.481E-05	5.361E-05	6.311E-	6.311E-
05	7.614E-05	9.317E-05	1.112E-04	1.301E-04	1.496E-04		
33	2.000E-02	2.246E-03	2.597E-03	2.956E-03	3.322E-03	3.692E-	3.692E-
03	4.161E-03	4.727E-03	5.285E-03	5.831E-03	6.362E-03		
32	1.950E-02	1.832E-02	1.931E-02	2.019E-02	2.096E-02	2.165E-	2.165E-
02	2.242E-02	2.320E-02	2.382E-02	2.433E-02	2.471E-02		
31	1.850E-02	1.062E-06	2.625E-06	1.704E-06	1.081E-06	6.673E-	6.673E-
07	1.394E-06	1.847E-06	1.257E-06	1.040E-06	9.718E-07		
30	1.800E-02	1.508E-01	6.825E-05	1.653E-01	2.382E-05	3.227E-	3.227E-
05	8.062E-05	1.305E-04	1.049E-04	8.735E-05	7.492E-05		
29	1.700E-02	3.622E-03	4.311E-03	2.884E-03	2.091E-01	1.418E-	1.418E-
01	2.139E-01	2.932E-03	2.208E-01	1.138E-01	2.078E-01		
28	1.600E-02	1.565E-02	1.832E-02	1.525E-02	1.262E-02	1.042E-	1.042E-
02	1.177E-02	1.151E-02	2.048E-01	6.450E-02	2.121E-01		
27	1.500E-02	2.908E-02	3.347E-02	2.985E-02	2.639E-02	2.310E-	2.310E-
02	2.536E-02	2.505E-02	2.053E-02	1.642E-02	2.036E-01		
26	1.400E-02	3.405E-02	3.900E-02	3.542E-02	3.190E-02	2.846E-	2.846E-
02	3.110E-02	3.100E-02	2.604E-02	2.151E-02	1.738E-02		
25	1.300E-02	3.121E-02	3.570E-02	3.216E-02	2.869E-02	2.532E-	2.532E-
02	2.771E-02	2.746E-02	2.257E-02	1.799E-02	1.388E-02		
24	1.200E-02	2.675E-02	3.097E-02	2.767E-02	2.447E-02	2.147E-	2.147E-
02	2.378E-02	2.381E-02	1.954E-02	1.555E-02	1.188E-02		
23	1.100E-02	2.514E-02	2.965E-02	2.692E-02	2.423E-02	2.161E-	2.161E-
02	2.431E-02	2.514E-02	2.176E-02	1.851E-02	1.545E-02		
22	1.000E-02	2.958E-02	3.463E-02	3.202E-02	2.946E-02	2.695E-	2.695E-
02	3.020E-02	3.148E-02	2.813E-02	2.494E-02	2.190E-02		
21	9.000E-03	3.616E-02	4.163E-02	3.913E-02	3.670E-02	3.433E-	3.433E-
02	3.812E-02	3.988E-02	3.669E-02	3.364E-02	3.065E-02		
20	8.000E-03	4.165E-02	4.751E-02	4.538E-02	4.325E-02	4.113E-	4.113E-
02	4.527E-02	4.746E-02	4.457E-02	4.174E-02	3.891E-02		
19	6.700E-03	3.828E-02	4.424E-02	4.271E-02	4.112E-02	3.948E-	3.948E-
02	4.369E-02	4.621E-02	4.396E-02	4.169E-02	3.938E-02		
18	5.500E-03	2.261E-02	2.762E-02	2.651E-02	2.535E-02	2.414E-	2.414E-
02	2.762E-02	2.973E-02	2.802E-02	2.631E-02	2.473E-02		
17	4.500E-03	1.204E-01	1.198E-01	1.193E-01	1.188E-01	1.184E-	1.184E-
01	1.182E-01	1.165E-01	1.177E-01	1.156E-01	1.176E-01		
16	3.700E-03	9.952E-02	9.849E-02	9.746E-02	9.680E-02	9.450E-	9.450E-
02	9.555E-02	9.032E-02	9.428E-02	8.517E-02	9.352E-02		
15	3.100E-03	7.821E-02	7.721E-02	7.634E-02	7.559E-02	7.495E-	7.495E-
02	7.440E-02	7.371E-02	7.315E-02	7.271E-02	7.234E-02		
14	2.600E-03	5.716E-02	5.638E-02	5.572E-02	5.517E-02	5.470E-	5.470E-
02	5.429E-02	5.380E-02	5.340E-02	5.308E-02	5.282E-02		
13	2.200E-03	3.849E-02	3.806E-02	3.772E-02	3.743E-02	3.720E-	3.720E-
02	3.702E-02	3.681E-02	3.666E-02	3.655E-02	3.648E-02		
12	1.900E-03	2.403E-02	2.397E-02	2.393E-02	2.392E-02	2.393E-	2.393E-
02	2.397E-02	2.404E-02	2.413E-02	2.424E-02	2.435E-02		
11	1.700E-03	1.481E-02	1.501E-02	1.520E-02	1.539E-02	1.557E-	1.557E-
02	1.579E-02	1.606E-02	1.632E-02	1.658E-02	1.683E-02		
10	1.500E-03	6.970E-03	7.353E-03	7.713E-03	8.052E-03	8.372E-	8.372E-
03	8.748E-03	9.171E-03	9.570E-03	9.948E-03	1.031E-02		
9	1.400E-03	4.363E-03	4.747E-03	5.109E-03	5.452E-03	5.778E-	5.778E-

37	2.800E-02	3.569E-10	3.794E-10	9.214E-10	1.582E-09	2.491E-
09	3.747E-09	5.201E-09	6.955E-09	8.938E-09	1.116E-08	
36	2.600E-02	5.923E-08	7.695E-08	1.007E-07	1.279E-07	1.630E-
07	2.072E-07	2.561E-07	3.094E-07	3.667E-07	4.277E-07	
35	2.400E-02	3.443E-06	4.167E-06	5.067E-06	6.025E-06	7.173E-
06	8.508E-06	9.885E-06	1.129E-05	1.271E-05	1.415E-05	
34	2.200E-02	1.695E-04	1.934E-04	2.210E-04	2.484E-04	2.788E-
04	3.118E-04	3.437E-04	3.743E-04	4.035E-04	4.315E-04	
33	2.000E-02	6.875E-03	7.452E-03	8.075E-03	8.656E-03	9.260E-
03	9.869E-03	1.041E-02	1.090E-02	1.132E-02	1.168E-02	
32	1.950E-02	2.500E-02	2.527E-02	2.544E-02	2.547E-02	2.542E-
02	2.528E-02	2.505E-02	2.475E-02	2.437E-02	2.394E-02	
31	1.850E-02	9.575E-07	1.898E-06	2.942E-06	2.761E-06	4.235E-
06	5.946E-06	6.135E-06	7.099E-06	8.777E-06	1.127E-05	
30	1.800E-02	6.578E-05	1.001E-04	1.299E-04	9.872E-05	9.717E-
05	9.506E-05	8.089E-05	7.852E-05	8.302E-05	9.191E-05	
29	1.700E-02	1.339E-03	2.065E-01	1.882E-01	1.761E-01	1.739E-
01	1.665E-01	2.614E-03	2.503E-03	2.159E-03	1.731E-03	
28	1.600E-02	4.059E-03	2.078E-01	2.159E-01	1.928E-01	1.981E-
01	1.852E-01	1.796E-01	1.765E-01	1.633E-01	1.529E-01	
27	1.500E-02	9.835E-03	2.107E-01	2.155E-01	1.999E-01	2.139E-
01	2.020E-01	1.936E-01	1.703E-01	1.761E-01	1.692E-01	
26	1.400E-02	1.348E-02	2.065E-01	1.235E-02	2.055E-01	2.202E-
01	1.986E-01	2.024E-01	1.983E-01	1.850E-01	1.791E-01	
25	1.300E-02	1.014E-02	9.156E-03	6.459E-02	6.337E-03	2.178E-
01	2.061E-01	2.087E-01	2.009E-01	1.923E-01	1.943E-01	
24	1.200E-02	8.697E-03	7.760E-03	5.841E-03	3.208E-03	2.138E-
01	9.490E-02	1.975E-01	2.089E-01	2.010E-01	1.523E-01	
23	1.100E-02	1.262E-02	1.256E-02	1.149E-02	8.684E-03	7.931E-
03	2.097E-01	7.905E-02	2.187E-01	2.176E-01	1.226E-01	
22	1.000E-02	1.899E-02	1.943E-02	1.873E-02	1.543E-02	1.448E-
02	1.283E-02	9.483E-03	6.366E-03	3.783E-03	1.730E-03	
21	9.000E-03	2.772E-02	2.870E-02	2.826E-02	2.450E-02	2.352E-
02	2.126E-02	1.658E-02	1.195E-02	7.577E-03	3.849E-03	
20	8.000E-03	3.608E-02	3.744E-02	3.734E-02	3.353E-02	3.272E-
02	3.039E-02	2.504E-02	1.946E-02	1.385E-02	8.671E-03	
19	6.700E-03	3.698E-02	3.855E-02	3.883E-02	3.554E-02	3.515E-
02	3.344E-02	2.876E-02	2.379E-02	1.859E-02	1.344E-02	
18	5.500E-03	2.305E-02	2.447E-02	2.494E-02	2.270E-02	2.283E-
02	2.220E-02	1.939E-02	1.633E-02	1.298E-02	9.496E-03	
17	4.500E-03	1.177E-01	1.179E-01	1.181E-01	1.185E-01	1.189E-
01	1.196E-01	1.203E-01	1.210E-01	1.218E-01	1.226E-01	
16	3.700E-03	9.327E-02	9.207E-02	9.296E-02	9.006E-02	9.297E-
02	9.313E-02	9.181E-02	9.363E-02	9.394E-02	9.433E-02	
15	3.100E-03	7.203E-02	7.179E-02	7.155E-02	7.139E-02	7.130E-
02	7.128E-02	7.132E-02	7.137E-02	7.146E-02	7.163E-02	
14	2.600E-03	5.261E-02	5.244E-02	5.227E-02	5.215E-02	5.208E-
02	5.207E-02	5.209E-02	5.212E-02	5.216E-02	5.225E-02	
13	2.200E-03	3.643E-02	3.641E-02	3.640E-02	3.642E-02	3.648E-
02	3.659E-02	3.672E-02	3.684E-02	3.696E-02	3.710E-02	
12	1.900E-03	2.448E-02	2.463E-02	2.481E-02	2.499E-02	2.520E-
02	2.546E-02	2.572E-02	2.597E-02	2.621E-02	2.645E-02	
11	1.700E-03	1.707E-02	1.735E-02	1.766E-02	1.796E-02	1.829E-
02	1.867E-02	1.903E-02	1.938E-02	1.972E-02	2.005E-02	
10	1.500E-03	1.065E-02	1.104E-02	1.146E-02	1.186E-02	1.230E-
02	1.276E-02	1.321E-02	1.364E-02	1.404E-02	1.444E-02	
9	1.400E-03	8.137E-03	8.538E-03	8.974E-03	9.391E-03	9.840E-
03	1.032E-02	1.078E-02	1.123E-02	1.166E-02	1.208E-02	
8	1.200E-03	4.352E-03	4.716E-03	5.119E-03	5.511E-03	5.938E-
03	6.400E-03	6.848E-03	7.286E-03	7.716E-03	8.134E-03	
7	1.000E-03	2.124E-03	2.392E-03	2.699E-03	3.006E-03	3.352E-
03	3.739E-03	4.127E-03	4.512E-03	4.892E-03	5.268E-03	
6	8.000E-04	9.602E-04	1.131E-03	1.336E-03	1.551E-03	1.801E-
03	2.089E-03	2.385E-03	2.687E-03	2.993E-03	3.304E-03	
5	6.000E-04	4.110E-04	5.086E-04	6.324E-04	7.677E-04	9.333E-
04	1.133E-03	1.346E-03	1.572E-03	1.809E-03	2.056E-03	

4	4.000E-04	1.744E-04	2.276E-04	2.990E-04	3.812E-04	4.871E-	
04	6.213E-04	7.715E-04	9.369E-04	1.117E-03	1.311E-03		
3	2.000E-04	8.272E-05	1.137E-04	1.577E-04	2.109E-04	2.830E-	
04	3.787E-04	4.905E-04	6.181E-04	7.615E-04	9.204E-04		
2	1.000E-04	6.262E-05	8.831E-05	1.257E-04	1.718E-04	2.355E-	
04	3.216E-04	4.236E-04	5.417E-04	6.759E-04	8.261E-04		
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0		X=	9.000E-03	9.500E-03	1.000E-02	1.500E-02	2.000E-
02	3.000E-02	4.000E-02	5.500E-02	6.000E-02	7.500E-02		
0		K=	41	42	43	44	45
46	47	48	49	50			
I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
58	7.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
57	7.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
56	6.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
55	6.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
54	6.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
53	6.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
52	6.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
51	5.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
50	5.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
49	5.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
48	5.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
47	4.900E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
46	4.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
45	4.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
44	4.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10		
43	4.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	8.625E-10		
42	3.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	3.569E-10	4.739E-10	1.776E-09	6.166E-09		
41	3.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	3.569E-10	9.092E-10	3.565E-09	1.157E-08	3.703E-08		
40	3.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-	
10	8.449E-10	6.881E-09	2.502E-08	7.456E-08	2.189E-07		
39	3.200E-02	3.569E-10	3.569E-10	3.569E-10	3.813E-10	1.871E-	
09	8.631E-09	5.326E-08	1.774E-07	4.802E-07	1.270E-06		
38	3.000E-02	3.569E-10	3.569E-10	1.428E-09	6.760E-09	2.312E-	
08	8.528E-08	4.236E-07	1.266E-06	3.052E-06	7.149E-06		
37	2.800E-02	1.361E-08	1.631E-08	4.567E-08	1.228E-07	3.032E-	
07	8.890E-07	3.463E-06	8.992E-06	1.888E-05	3.846E-05		
36	2.600E-02	4.917E-07	5.591E-07	1.138E-06	2.198E-06	4.154E-	
06	9.740E-06	2.886E-05	6.248E-05	1.113E-04	1.930E-04		
35	2.400E-02	1.558E-05	1.703E-05	2.733E-05	4.046E-05	6.099E-	
05	1.127E-04	2.391E-04	4.074E-04	5.967E-04	8.605E-04		
34	2.200E-02	4.583E-04	4.849E-04	6.425E-04	7.808E-04	9.551E-	
04	1.269E-03	1.746E-03	2.217E-03	2.610E-03	3.114E-03		
33	2.000E-02	1.199E-02	1.225E-02	1.309E-02	1.289E-02	1.155E-	

02	9.958E-03	8.811E-03	8.493E-03	8.304E-03	8.532E-03		
32	1.950E-02	2.348E-02	2.299E-02	2.190E-02	1.916E-02	1.585E-	
02	1.303E-02	1.118E-02	1.058E-02	1.019E-02	1.035E-02		
31	1.850E-02	1.475E-05	1.629E-05	5.202E-02	3.849E-02	2.777E-	
02	2.096E-02	1.704E-02	1.566E-02	1.475E-02	1.471E-02		
30	1.800E-02	1.038E-04	9.434E-05	4.349E-04	4.913E-02	3.404E-	
02	2.517E-02	2.022E-02	1.847E-02	1.733E-02	1.720E-02		
29	1.700E-02	1.331E-03	5.757E-04	2.147E-03	1.453E-03	4.652E-	
02	3.372E-02	2.695E-02	2.466E-02	2.311E-02	2.287E-02		
28	1.600E-02	3.323E-03	1.456E-03	7.544E-03	4.396E-03	5.834E-	
02	4.244E-02	3.433E-02	3.180E-02	2.993E-02	2.966E-02		
27	1.500E-02	1.578E-01	2.488E-03	1.457E-02	8.056E-03	4.978E-	
03	5.257E-02	4.334E-02	4.072E-02	3.844E-02	3.808E-02		
26	1.400E-02	1.696E-01	1.663E-01	1.525E-01	1.132E-02	7.925E-	
03	6.637E-03	5.539E-02	5.250E-02	4.946E-02	4.878E-02		
25	1.300E-02	1.783E-01	8.482E-04	1.675E-01	1.166E-02	9.959E-	
03	9.173E-03	8.725E-03	7.876E-03	8.667E-03	1.012E-02		
24	1.200E-02	1.879E-01	2.335E-04	1.798E-01	5.245E-03	7.599E-	
03	1.018E-02	1.244E-02	1.300E-02	1.430E-02	1.626E-02		
23	1.100E-02	2.031E-01	1.964E-05	1.904E-01	9.970E-04	2.853E-	
03	1.034E-02	1.765E-02	1.875E-02	2.026E-02	2.435E-02		
22	1.000E-02	4.667E-04	4.849E-05	2.165E-01	1.935E-01	1.743E-	
01	1.627E-01	1.523E-01	1.380E-01	1.268E-01	1.219E-01		
21	9.000E-03	1.344E-03	2.450E-04	3.353E-03	8.389E-04	2.206E-	
01	2.054E-01	1.944E-01	1.745E-01	1.618E-01	1.536E-01		
20	8.000E-03	4.494E-03	1.761E-03	1.413E-02	7.611E-03	1.548E-	
02	1.999E-01	2.074E-01	2.147E-01	1.969E-01	1.868E-01		
19	6.700E-03	8.725E-03	4.870E-03	2.640E-02	2.077E-02	2.853E-	
02	2.511E-02	3.372E-02	1.121E-02	2.014E-01	2.102E-01		
18	5.500E-03	6.155E-03	3.331E-03	2.031E-02	1.551E-02	1.747E-	
02	1.604E-02	2.060E-02	1.531E-02	2.117E-02	2.823E-02		
17	4.500E-03	1.235E-01	1.244E-01	1.254E-01	2.655E-03	2.582E-	
03	2.198E-03	3.889E-03	7.074E-03	1.271E-02	1.400E-02		
16	3.700E-03	9.483E-02	8.644E-02	9.667E-02	1.101E-01	1.187E-	
01	2.822E-05	1.012E-04	5.881E-04	2.400E-03	3.645E-03		
15	3.100E-03	7.190E-02	7.245E-02	7.368E-02	8.332E-02	9.245E-	
02	1.099E-01	1.256E-01	5.381E-06	1.118E-04	4.622E-04		
14	2.600E-03	5.240E-02	5.276E-02	5.435E-02	6.169E-02	7.100E-	
02	8.788E-02	1.064E-01	2.098E-09	1.023E-06	3.546E-05		
13	2.200E-03	3.725E-02	3.747E-02	3.946E-02	4.564E-02	5.494E-	
02	7.120E-02	9.147E-02	1.181E-01	2.238E-09	1.252E-06		
12	1.900E-03	2.669E-02	2.695E-02	2.914E-02	3.480E-02	4.398E-	
02	5.971E-02	8.079E-02	1.065E-01	2.396E-14	2.404E-08		
11	1.700E-03	2.036E-02	2.067E-02	2.297E-02	2.837E-02	3.739E-	
02	5.273E-02	7.408E-02	9.927E-02	1.246E-01	1.954E-09		
10	1.500E-03	1.482E-02	1.520E-02	1.754E-02	2.268E-02	3.146E-	
02	4.638E-02	6.782E-02	9.249E-02	1.176E-01	2.038E-11		
9	1.400E-03	1.248E-02	1.287E-02	1.520E-02	2.019E-02	2.881E-	
02	4.349E-02	6.491E-02	8.932E-02	1.143E-01	1.186E-12		
8	1.200E-03	8.540E-03	8.934E-03	1.118E-02	1.586E-02	2.412E-	
02	3.831E-02	5.962E-02	8.347E-02	1.082E-01	7.710E-14		
7	1.000E-03	5.639E-03	6.004E-03	8.098E-03	1.245E-02	2.031E-	
02	3.401E-02	5.511E-02	7.845E-02	1.030E-01	1.258E-01		
6	8.000E-04	3.619E-03	3.940E-03	5.828E-03	9.840E-03	1.731E-	
02	3.056E-02	5.141E-02	7.436E-02	9.889E-02	1.233E-01		
5	6.000E-04	2.312E-03	2.576E-03	4.239E-03	7.949E-03	1.508E-	
02	2.795E-02	4.857E-02	7.118E-02	9.566E-02	1.201E-01		
4	4.000E-04	1.517E-03	1.735E-03	3.205E-03	6.671E-03	1.355E-	
02	2.611E-02	4.655E-02	6.894E-02	9.332E-02	1.177E-01		
3	2.000E-04	1.094E-03	1.282E-03	2.630E-03	5.939E-03	1.265E-	
02	2.504E-02	4.536E-02	6.760E-02	9.191E-02	1.163E-01		
2	1.000E-04	9.918E-04	1.173E-03	2.489E-03	5.759E-03	1.243E-	
02	2.478E-02	4.507E-02	6.727E-02	9.157E-02	1.159E-01		
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0		X=	8.000E-02	9.500E-02	1.100E-01	1.250E-01	1.350E-

	01	1.450E-01	1.550E-01	1.650E-01	1.750E-01				
0		K=			51	52	53	54	55
56		57	58	59					
I	Y								
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
58	7.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
57	7.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
56	6.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
55	6.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
54	6.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
53	6.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
52	6.000E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
51	5.800E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
50	5.600E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
49	5.400E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	0.000E+00				
48	5.200E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10
10	3.569E-10	3.569E-10	3.569E-10	5.404E-10	0.000E+00				
47	4.900E-02	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.569E-10	3.947E-10	3.569E-10
10	1.027E-09	2.030E-09	4.598E-09	0.000E+00					
46	4.600E-02	3.569E-10	3.569E-10	8.378E-10	2.448E-09	4.723E-10			
09	8.719E-09	1.505E-08	3.099E-08	0.000E+00					
45	4.400E-02	3.569E-10	9.376E-10	4.557E-09	1.184E-08	2.191E-10			
08	3.869E-08	6.437E-08	1.254E-07	0.000E+00					
44	4.200E-02	4.701E-10	4.622E-09	2.030E-08	4.973E-08	8.936E-10			
08	1.531E-07	2.467E-07	4.562E-07	0.000E+00					
43	4.000E-02	3.106E-09	2.250E-08	8.774E-08	2.038E-07	3.542E-10			
07	5.863E-07	9.131E-07	1.599E-06	0.000E+00					
42	3.800E-02	1.818E-08	1.066E-07	3.719E-07	8.141E-07	1.364E-10			
06	2.174E-06	3.265E-06	5.404E-06	0.000E+00					
41	3.600E-02	1.008E-07	4.944E-07	1.535E-06	3.151E-06	5.071E-10			
06	7.766E-06	1.122E-05	1.754E-05	0.000E+00					
40	3.400E-02	5.480E-07	2.234E-06	6.131E-06	1.174E-05	1.809E-10			
05	2.654E-05	3.683E-05	5.430E-05	0.000E+00					
39	3.200E-02	2.889E-06	9.742E-06	2.351E-05	4.179E-05	6.138E-10			
05	8.603E-05	1.145E-04	1.592E-04	0.000E+00					
38	3.000E-02	1.460E-05	4.056E-05	8.557E-05	1.405E-04	1.960E-10			
04	2.618E-04	3.338E-04	4.379E-04	0.000E+00					
37	2.800E-02	6.957E-05	1.587E-04	2.911E-04	4.389E-04	5.799E-10			
04	7.362E-04	8.985E-04	1.114E-03	0.000E+00					
36	2.600E-02	3.048E-04	5.681E-04	9.029E-04	1.245E-03	1.554E-10			
03	1.874E-03	2.191E-03	2.582E-03	0.000E+00					
35	2.400E-02	1.170E-03	1.786E-03	2.463E-03	3.114E-03	3.677E-10			
03	4.229E-03	4.760E-03	5.388E-03	0.000E+00					
34	2.200E-02	3.655E-03	4.673E-03	5.731E-03	6.765E-03	7.664E-10			
03	8.514E-03	9.338E-03	1.033E-02	0.000E+00					
33	2.000E-02	8.979E-03	1.020E-02	1.160E-02	1.314E-02	1.454E-10			
02	1.583E-02	1.712E-02	1.873E-02	0.000E+00					
32	1.950E-02	1.079E-02	1.212E-02	1.366E-02	1.539E-02	1.698E-10			
02	1.841E-02	1.985E-02	2.164E-02	0.000E+00					
31	1.850E-02	1.511E-02	1.672E-02	1.858E-02	2.079E-02	2.283E-10			
02	2.459E-02	2.640E-02	2.854E-02	0.000E+00					
30	1.800E-02	1.762E-02	1.941E-02	2.148E-02	2.399E-02	2.630E-10			
02	2.825E-02	3.028E-02	3.259E-02	0.000E+00					
29	1.700E-02	2.336E-02	2.562E-02	2.821E-02	3.146E-02	3.441E-10			
02	3.681E-02	3.931E-02	4.197E-02	0.000E+00					

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 28 1.600E-02 3.030E-02 3.325E-02 3.655E-02 4.074E-02 4.446E-
02 4.739E-02 5.035E-02 5.318E-02 0.000E+00
 27 1.500E-02 3.894E-02 4.287E-02 4.712E-02 5.238E-02 5.690E-
02 6.054E-02 2.406E-02 3.464E-02 0.000E+00
 26 1.400E-02 4.989E-02 5.509E-02 6.066E-02 1.996E-02 2.169E-
02 2.587E-02 3.195E-02 4.230E-02 0.000E+00
 25 1.300E-02 1.269E-02 1.990E-02 2.306E-02 2.689E-02 2.966E-
02 3.350E-02 4.026E-02 4.939E-02 0.000E+00
 24 1.200E-02 1.978E-02 2.900E-02 3.227E-02 3.632E-02 1.078E-
01 1.129E-01 1.154E-01 1.156E-01 0.000E+00
 23 1.100E-02 2.736E-02 1.096E-01 1.181E-01 1.245E-01 1.306E-
01 1.359E-01 1.373E-01 1.352E-01 0.000E+00
 22 1.000E-02 1.242E-01 1.368E-01 1.458E-01 1.514E-01 1.568E-
01 1.617E-01 1.616E-01 1.565E-01 0.000E+00
 21 9.000E-03 1.563E-01 1.690E-01 1.748E-01 1.778E-01 1.809E-
01 1.838E-01 1.821E-01 1.758E-01 0.000E+00
 20 8.000E-03 1.886E-01 1.990E-01 2.036E-01 2.049E-01 2.068E-
01 2.087E-01 2.043E-01 1.948E-01 0.000E+00
 19 6.700E-03 2.104E-01 2.065E-01 2.065E-01 2.078E-01 2.084E-
01 2.086E-01 2.129E-01 2.196E-01 0.000E+00
 18 5.500E-03 2.201E-02 2.617E-02 3.171E-02 3.381E-02 3.509E-
02 4.571E-02 1.963E-01 2.044E-01 0.000E+00
 17 4.500E-03 1.112E-02 1.296E-02 1.560E-02 1.638E-02 1.518E-
02 2.154E-02 3.719E-02 7.197E-02 0.000E+00
 16 3.700E-03 3.853E-03 5.546E-03 7.503E-03 8.992E-03 9.863E-
03 1.560E-02 2.907E-02 6.175E-02 0.000E+00
 15 3.100E-03 9.033E-04 2.096E-03 3.605E-03 5.081E-03 6.360E-
03 1.078E-02 2.025E-02 5.173E-02 0.000E+00
 14 2.600E-03 2.002E-04 8.848E-04 1.997E-03 3.268E-03 4.511E-
03 8.010E-03 1.514E-02 4.421E-02 0.000E+00
 13 2.200E-03 4.512E-05 4.068E-04 1.147E-03 2.100E-03 3.103E-
03 5.759E-03 1.116E-02 3.629E-02 0.000E+00
 12 1.900E-03 1.042E-05 1.690E-04 5.734E-04 1.158E-03 1.812E-
03 3.573E-03 7.282E-03 2.716E-02 0.000E+00
 11 1.700E-03 2.520E-06 8.531E-05 3.491E-04 7.521E-04 1.215E-
03 2.491E-03 5.225E-03 2.142E-02 0.000E+00
 10 1.500E-03 1.574E-07 3.110E-05 1.832E-04 4.273E-04 7.136E-
04 1.541E-03 3.349E-03 1.555E-02 0.000E+00
 9 1.400E-03 4.123E-08 2.601E-05 1.806E-04 4.215E-04 6.975E-
04 1.493E-03 3.181E-03 1.467E-02 0.000E+00
 8 1.200E-03 3.001E-08 7.813E-05 5.247E-04 1.066E-03 1.603E-
03 3.009E-03 5.548E-03 1.986E-02 0.000E+00
 7 1.000E-03 6.111E-09 7.986E-05 5.635E-04 1.094E-03 1.592E-
03 2.926E-03 5.252E-03 1.820E-02 0.000E+00
 6 8.000E-04 8.480E-09 6.962E-05 5.333E-04 1.007E-03 1.429E-
03 2.602E-03 4.612E-03 1.580E-02 0.000E+00
 5 6.000E-04 6.605E-09 4.875E-05 4.011E-04 7.618E-04 1.070E-
03 1.973E-03 3.520E-03 1.243E-02 0.000E+00
 4 4.000E-04 1.476E-09 1.926E-05 1.930E-04 3.850E-04 5.484E-
04 1.068E-03 1.988E-03 7.918E-03 0.000E+00
 3 2.000E-04 1.447E-12 4.887E-07 1.138E-05 2.876E-05 4.571E-
05 1.136E-04 2.628E-04 1.791E-03 0.000E+00
 2 1.000E-04 2.418E-19 1.106E-10 1.778E-08 7.945E-08 1.669E-
07 7.401E-07 2.919E-06 6.945E-05 0.000E+00
 1 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00

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0 X= 0.000E+00 1.000E-04 2.000E-04 3.000E-04 4.000E-
04 5.000E-04 6.000E-04 7.000E-04 8.000E-04 9.000E-04
0 K= 1 2 3 4 5
6 7 8 9 10
I Y
59 7.600E-02 2.089E-01 2.089E-01 2.089E-01 2.089E-01 2.089E-
01 2.089E-01 2.089E-01 2.089E-01 2.089E-01

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25	1.300E-02	1.786E-01	1.474E-01	1.562E-01	1.549E-01	1.536E-
01	1.525E-01	1.515E-01	1.507E-01	1.502E-01	1.498E-01	
24	1.200E-02	1.769E-01	1.426E-01	1.525E-01	1.516E-01	1.508E-
01	1.502E-01	1.498E-01	1.495E-01	1.495E-01	1.496E-01	
23	1.100E-02	1.748E-01	1.365E-01	1.474E-01	1.472E-01	1.470E-
01	1.469E-01	1.470E-01	1.471E-01	1.475E-01	1.480E-01	
22	1.000E-02	1.717E-01	1.329E-01	1.446E-01	1.439E-01	1.432E-
01	1.426E-01	1.423E-01	1.421E-01	1.421E-01	1.423E-01	
21	9.000E-03	1.678E-01	1.180E-01	1.308E-01	1.310E-01	1.310E-
01	1.311E-01	1.312E-01	1.313E-01	1.316E-01	1.320E-01	
20	8.000E-03	1.635E-01	1.071E-01	1.202E-01	1.207E-01	1.211E-
01	1.214E-01	1.216E-01	1.219E-01	1.222E-01	1.225E-01	
19	6.700E-03	1.569E-01	1.103E-01	1.223E-01	1.226E-01	1.227E-
01	1.226E-01	1.224E-01	1.222E-01	1.220E-01	1.219E-01	
18	5.500E-03	1.502E-01	1.310E-01	1.386E-01	1.381E-01	1.374E-
01	1.366E-01	1.358E-01	1.350E-01	1.342E-01	1.334E-01	
17	4.500E-03	1.430E-01	1.410E-01	1.421E-01	1.417E-01	1.412E-
01	1.407E-01	1.402E-01	1.397E-01	1.392E-01	1.718E-08	
16	3.700E-03	1.335E-01	1.606E-08	1.584E-08	1.572E-08	1.559E-
08	1.545E-08	1.531E-08	1.516E-08	1.500E-08	1.484E-08	
15	3.100E-03	1.172E-01	1.357E-08	1.322E-08	1.303E-08	1.285E-
08	1.266E-08	1.247E-08	1.230E-08	1.212E-08	1.196E-08	
14	2.600E-03	9.912E-02	1.103E-08	1.047E-08	1.020E-08	9.945E-
09	9.704E-09	9.485E-09	9.284E-09	9.099E-09	8.931E-09	
13	2.200E-03	7.853E-02	8.361E-09	7.480E-09	7.119E-09	6.831E-
09	6.595E-09	6.398E-09	6.234E-09	6.093E-09	5.970E-09	
12	1.900E-03	3.930E-02	3.869E-09	3.656E-09	3.600E-09	3.564E-
09	3.537E-09	3.513E-09	3.489E-09	3.467E-09	3.445E-09	
11	1.700E-03	7.603E-04	7.021E-11	7.921E-10	1.121E-09	1.347E-
09	1.503E-09	1.616E-09	1.697E-09	1.758E-09	1.805E-09	
10	1.500E-03	0.000E+00	2.304E-15	5.627E-11	1.279E-10	2.024E-
10	2.751E-10	3.438E-10	4.078E-10	4.671E-10	5.227E-10	
9	1.400E-03	0.000E+00	2.304E-15	7.762E-12	2.416E-11	4.769E-
11	7.666E-11	1.095E-10	1.448E-10	1.815E-10	2.189E-10	
8	1.200E-03	0.000E+00	4.840E-18	4.288E-13	1.745E-12	4.231E-
12	8.053E-12	1.328E-11	1.990E-11	2.787E-11	3.709E-11	
7	1.000E-03	0.000E+00	2.304E-15	2.530E-14	1.196E-13	3.460E-
13	7.588E-13	1.420E-12	2.376E-12	3.673E-12	5.349E-12	
6	8.000E-04	0.000E+00	2.304E-15	3.454E-15	1.035E-14	2.875E-
14	6.783E-14	1.414E-13	2.621E-13	4.415E-13	6.967E-13	
5	6.000E-04	0.000E+00	4.840E-18	1.154E-15	1.154E-15	2.304E-
15	6.903E-15	1.495E-14	2.875E-14	5.174E-14	8.623E-14	
4	4.000E-04	0.000E+00	4.840E-18	1.154E-15	1.154E-15	2.304E-
15	2.304E-15	3.454E-15	5.753E-15	9.202E-15	1.265E-14	
3	2.000E-04	0.000E+00	2.304E-15	1.154E-15	2.304E-15	2.304E-
15	2.304E-15	2.304E-15	3.454E-15	3.454E-15	4.603E-15	
2	1.000E-04	0.000E+00	4.840E-18	4.840E-18	4.840E-18	4.840E-
18	4.840E-18	2.304E-15	2.304E-15	3.454E-15	3.454E-15	
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	2.490E-08	2.490E-08	3.735E-08	3.735E-08	
0	X=	1.000E-03	1.100E-03	1.200E-03	1.300E-03	1.400E-
03	1.500E-03	1.600E-03	1.700E-03	1.800E-03	1.900E-03	
0	K=	11	12	13	14	15
16	17	18	19	20		

I	Y					
59	7.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
58	7.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
57	7.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
56	6.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
55	6.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
54	6.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-

01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
53	6.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
52	6.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
51	5.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
50	5.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
49	5.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
48	5.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
47	4.900E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
46	4.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
45	4.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
44	4.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
43	4.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
42	3.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
41	3.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
40	3.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
39	3.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
38	3.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
37	2.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
36	2.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
35	2.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
34	2.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.088E-
01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	
33	2.000E-02	2.082E-01	2.081E-01	2.080E-01	2.079E-01	2.077E-01	2.077E-
01	2.076E-01	2.075E-01	2.073E-01	2.072E-01	2.070E-01	2.070E-01	
32	1.950E-02	1.986E-01	1.978E-01	1.970E-01	1.963E-01	1.956E-01	1.956E-
01	1.950E-01	1.944E-01	1.938E-01	1.933E-01	1.928E-01	1.928E-01	
31	1.850E-02	1.986E-01	1.988E-01	1.989E-01	1.991E-01	1.992E-01	1.992E-
01	1.993E-01	1.994E-01	1.995E-01	1.997E-01	1.998E-01	1.998E-01	
30	1.800E-02	1.937E-01	1.939E-01	1.941E-01	1.943E-01	1.945E-01	1.945E-
01	1.947E-01	1.949E-01	1.951E-01	1.953E-01	1.955E-01	1.955E-01	
29	1.700E-02	1.827E-01	1.830E-01	1.834E-01	1.839E-01	1.844E-01	1.844E-
01	1.850E-01	1.857E-01	1.863E-01	1.870E-01	1.876E-01	1.876E-01	
28	1.600E-02	1.670E-01	1.674E-01	1.681E-01	1.689E-01	1.699E-01	1.699E-
01	1.710E-01	1.723E-01	1.736E-01	1.749E-01	1.763E-01	1.763E-01	
27	1.500E-02	1.551E-01	1.553E-01	1.557E-01	1.563E-01	1.571E-01	1.571E-
01	1.581E-01	1.593E-01	1.607E-01	1.622E-01	1.638E-01	1.638E-01	
26	1.400E-02	1.503E-01	1.502E-01	1.505E-01	1.509E-01	1.516E-01	1.516E-
01	1.526E-01	1.537E-01	1.550E-01	1.565E-01	1.581E-01	1.581E-01	
25	1.300E-02	1.497E-01	1.499E-01	1.503E-01	1.510E-01	1.519E-01	1.519E-
01	1.530E-01	1.543E-01	1.558E-01	1.574E-01	1.591E-01	1.591E-01	
24	1.200E-02	1.500E-01	1.506E-01	1.513E-01	1.523E-01	1.535E-01	1.535E-
01	1.548E-01	1.563E-01	1.579E-01	1.596E-01	1.613E-01	1.613E-01	
23	1.100E-02	1.486E-01	1.495E-01	1.504E-01	1.515E-01	1.527E-01	1.527E-
01	1.541E-01	1.555E-01	1.571E-01	1.586E-01	1.603E-01	1.603E-01	
22	1.000E-02	1.427E-01	1.433E-01	1.440E-01	1.449E-01	1.459E-01	1.459E-
01	1.471E-01	1.483E-01	1.496E-01	1.510E-01	1.525E-01	1.525E-01	
21	9.000E-03	1.324E-01	1.331E-01	1.338E-01	1.346E-01	1.356E-01	1.356E-

49	5.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
48	5.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
47	4.900E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
46	4.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
45	4.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
44	4.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
43	4.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
42	3.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
41	3.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
40	3.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
39	3.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
38	3.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
37	2.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
36	2.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
35	2.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
34	2.200E-02	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01
01	2.088E-01	2.088E-01	2.088E-01	2.087E-01	2.087E-01	2.087E-01	2.087E-01
33	2.000E-02	2.068E-01	2.065E-01	2.062E-01	2.058E-01	2.055E-01	2.055E-01
01	2.051E-01	2.046E-01	2.041E-01	2.036E-01	2.031E-01	2.031E-01	2.031E-01
32	1.950E-02	1.922E-01	1.913E-01	1.906E-01	1.899E-01	1.892E-01	1.892E-01
01	1.885E-01	1.878E-01	1.873E-01	1.868E-01	1.865E-01	1.865E-01	1.865E-01
31	1.850E-02	1.999E-01	2.001E-01	2.003E-01	2.005E-01	2.007E-01	2.007E-01
01	2.009E-01	2.011E-01	2.014E-01	2.016E-01	2.019E-01	2.019E-01	2.019E-01
30	1.800E-02	8.290E-06	1.959E-01	4.476E-05	1.967E-01	1.970E-01	1.970E-01
01	1.973E-01	1.977E-01	1.982E-01	1.986E-01	1.990E-01	1.990E-01	1.990E-01
29	1.700E-02	1.861E-01	1.860E-01	1.878E-01	3.866E-06	1.786E-01	1.786E-01
08	5.072E-06	1.897E-01	6.811E-06	2.168E-07	1.391E-02	1.782E-01	1.782E-01
28	1.600E-02	1.711E-01	1.690E-01	1.725E-01	1.755E-01	1.782E-01	1.782E-01
01	1.775E-01	1.785E-01	2.791E-06	1.612E-09	4.610E-06	1.782E-01	1.782E-01
27	1.500E-02	1.556E-01	1.519E-01	1.561E-01	1.600E-01	1.639E-01	1.639E-01
01	1.622E-01	1.634E-01	1.687E-01	1.736E-01	2.488E-06	1.639E-01	1.639E-01
26	1.400E-02	1.491E-01	1.448E-01	1.491E-01	1.532E-01	1.573E-01	1.573E-01
01	1.553E-01	1.564E-01	1.622E-01	1.676E-01	1.725E-01	1.573E-01	1.573E-01
25	1.300E-02	1.507E-01	1.468E-01	1.511E-01	1.553E-01	1.594E-01	1.594E-01
01	1.577E-01	1.590E-01	1.648E-01	1.702E-01	1.752E-01	1.594E-01	1.594E-01
24	1.200E-02	1.537E-01	1.501E-01	1.541E-01	1.581E-01	1.619E-01	1.619E-01
01	1.603E-01	1.614E-01	1.667E-01	1.717E-01	1.761E-01	1.619E-01	1.619E-01
23	1.100E-02	1.528E-01	1.489E-01	1.524E-01	1.559E-01	1.592E-01	1.592E-01
01	1.572E-01	1.574E-01	1.620E-01	1.663E-01	1.703E-01	1.592E-01	1.592E-01
22	1.000E-02	1.441E-01	1.395E-01	1.428E-01	1.461E-01	1.493E-01	1.493E-01
01	1.466E-01	1.463E-01	1.507E-01	1.548E-01	1.589E-01	1.493E-01	1.493E-01
21	9.000E-03	1.323E-01	1.271E-01	1.303E-01	1.333E-01	1.364E-01	1.364E-01
01	1.330E-01	1.321E-01	1.363E-01	1.403E-01	1.442E-01	1.364E-01	1.364E-01
20	8.000E-03	1.210E-01	1.152E-01	1.179E-01	1.206E-01	1.233E-01	1.233E-01
01	1.195E-01	1.180E-01	1.218E-01	1.256E-01	1.293E-01	1.233E-01	1.233E-01
19	6.700E-03	1.160E-01	1.098E-01	1.118E-01	1.137E-01	1.158E-01	1.158E-01
01	1.116E-01	1.095E-01	1.125E-01	1.155E-01	1.186E-01	1.158E-01	1.158E-01
18	5.500E-03	1.236E-01	1.180E-01	1.192E-01	1.204E-01	1.218E-01	1.218E-01
01	1.181E-01	1.159E-01	1.181E-01	1.202E-01	1.223E-01	1.218E-01	1.218E-01
17	4.500E-03	1.651E-08	1.642E-08	1.635E-08	1.629E-08	1.622E-01	1.622E-01
08	1.620E-08	1.557E-08	1.614E-08	1.482E-08	1.613E-08	1.622E-01	1.622E-01

01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
44	4.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
43	4.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
42	3.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
41	3.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
40	3.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
39	3.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
38	3.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
37	2.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
36	2.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
35	2.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.088E-01	2.088E-01	2.088E-01	
34	2.200E-02	2.087E-01	2.087E-01	2.087E-01	2.086E-01	2.086E-
01	2.086E-01	2.085E-01	2.085E-01	2.085E-01	2.085E-01	
33	2.000E-02	2.026E-01	2.021E-01	2.015E-01	2.010E-01	2.005E-
01	1.999E-01	1.994E-01	1.990E-01	1.986E-01	1.983E-01	
32	1.950E-02	1.862E-01	1.859E-01	1.858E-01	1.858E-01	1.858E-
01	1.859E-01	1.861E-01	1.864E-01	1.868E-01	1.871E-01	
31	1.850E-02	2.021E-01	2.023E-01	2.026E-01	2.029E-01	2.031E-
01	2.034E-01	2.037E-01	2.040E-01	2.042E-01	2.045E-01	
30	1.800E-02	1.993E-01	1.996E-01	2.000E-01	2.005E-01	2.009E-
01	2.013E-01	2.018E-01	2.022E-01	2.026E-01	2.029E-01	
29	1.700E-02	1.939E-01	1.589E-02	3.445E-02	6.216E-04	4.948E-
02	5.723E-02	1.968E-01	1.974E-01	1.983E-01	1.992E-01	
28	1.600E-02	1.885E-01	9.689E-04	5.447E-03	1.226E-04	2.410E-
02	4.687E-04	4.354E-02	7.759E-03	6.029E-02	6.974E-02	
27	1.500E-02	1.814E-01	4.276E-06	5.485E-06	6.904E-03	7.483E-
03	1.357E-03	2.882E-02	1.489E-04	4.716E-02	5.306E-02	
26	1.400E-02	1.770E-01	3.199E-06	1.801E-01	8.441E-04	6.663E-
06	9.902E-06	1.957E-02	1.367E-03	3.783E-02	2.055E-03	
25	1.300E-02	1.796E-01	1.814E-01	1.614E-09	1.860E-01	6.051E-
06	9.573E-03	1.296E-02	2.121E-02	3.013E-02	1.415E-02	
24	1.200E-02	1.801E-01	1.819E-01	1.847E-01	1.880E-01	5.054E-
06	3.743E-08	5.212E-04	1.274E-02	2.103E-02	9.305E-06	
23	1.100E-02	1.740E-01	1.750E-01	1.771E-01	1.809E-01	1.826E-
01	4.011E-06	7.578E-09	6.292E-06	3.642E-03	4.709E-07	
22	1.000E-02	1.627E-01	1.631E-01	1.650E-01	1.694E-01	1.714E-
01	1.743E-01	1.786E-01	1.827E-01	1.861E-01	1.889E-01	
21	9.000E-03	1.480E-01	1.478E-01	1.494E-01	1.542E-01	1.563E-
01	1.598E-01	1.656E-01	1.714E-01	1.767E-01	1.813E-01	
20	8.000E-03	1.330E-01	1.323E-01	1.334E-01	1.383E-01	1.402E-
01	1.437E-01	1.503E-01	1.571E-01	1.638E-01	1.700E-01	
19	6.700E-03	1.218E-01	1.207E-01	1.213E-01	1.257E-01	1.269E-
01	1.298E-01	1.358E-01	1.420E-01	1.483E-01	1.547E-01	
18	5.500E-03	1.246E-01	1.234E-01	1.235E-01	1.266E-01	1.272E-
01	1.287E-01	1.327E-01	1.369E-01	1.413E-01	1.459E-01	
17	4.500E-03	1.614E-08	1.616E-08	1.619E-08	1.624E-08	1.631E-
08	1.639E-08	1.649E-08	1.659E-08	1.670E-08	1.681E-08	
16	3.700E-03	1.279E-08	1.237E-08	1.274E-08	1.112E-08	1.275E-
08	1.277E-08	1.214E-08	1.284E-08	1.288E-08	1.293E-08	
15	3.100E-03	9.876E-09	9.843E-09	9.810E-09	9.788E-09	9.776E-
09	9.773E-09	9.778E-09	9.785E-09	9.797E-09	9.820E-09	
14	2.600E-03	7.213E-09	7.189E-09	7.166E-09	7.150E-09	7.140E-
09	7.138E-09	7.142E-09	7.146E-09	7.151E-09	7.164E-09	
13	2.200E-03	4.994E-09	4.991E-09	4.991E-09	4.994E-09	5.001E-
09	5.016E-09	5.034E-09	5.050E-09	5.067E-09	5.086E-09	
12	1.900E-03	3.356E-09	3.376E-09	3.401E-09	3.426E-09	3.455E-

16	3.700E-03	1.364E-08	1.350E-08	1.334E-08	1.327E-08	1.247E-
08	1.310E-08	1.036E-08	1.293E-08	8.293E-09	1.282E-08	
15	3.100E-03	1.072E-08	1.058E-08	1.047E-08	1.036E-08	1.028E-
08	1.020E-08	1.011E-08	1.003E-08	9.968E-09	9.917E-09	
14	2.600E-03	7.837E-09	7.729E-09	7.639E-09	7.564E-09	7.499E-
09	7.443E-09	7.375E-09	7.321E-09	7.278E-09	7.242E-09	
13	2.200E-03	5.276E-09	5.218E-09	5.171E-09	5.132E-09	5.100E-
09	5.075E-09	5.046E-09	5.025E-09	5.011E-09	5.001E-09	
12	1.900E-03	3.294E-09	3.286E-09	3.281E-09	3.280E-09	3.281E-
09	3.286E-09	3.296E-09	3.309E-09	3.323E-09	3.339E-09	
11	1.700E-03	2.030E-09	2.058E-09	2.084E-09	2.110E-09	2.135E-
09	2.165E-09	2.202E-09	2.238E-09	2.273E-09	2.307E-09	
10	1.500E-03	9.555E-10	1.008E-09	1.057E-09	1.104E-09	1.148E-
09	1.199E-09	1.257E-09	1.312E-09	1.364E-09	1.413E-09	
9	1.400E-03	5.982E-10	6.508E-10	7.005E-10	7.474E-10	7.921E-
10	8.447E-10	9.040E-10	9.602E-10	1.014E-09	1.066E-09	
8	1.200E-03	1.983E-10	2.309E-10	2.636E-10	2.962E-10	3.286E-
10	3.686E-10	4.158E-10	4.620E-10	5.077E-10	5.527E-10	
7	1.000E-03	5.540E-11	6.961E-11	8.496E-11	1.013E-10	1.185E-
10	1.412E-10	1.696E-10	1.990E-10	2.293E-10	2.600E-10	
6	8.000E-04	1.363E-11	1.855E-11	2.429E-11	3.084E-11	3.818E-
11	4.852E-11	6.250E-11	7.793E-11	9.469E-11	1.126E-10	
5	6.000E-04	3.078E-12	4.548E-12	6.402E-12	8.672E-12	1.138E-
11	1.549E-11	2.148E-11	2.858E-11	3.677E-11	4.603E-11	
4	4.000E-04	6.737E-13	1.083E-12	1.642E-12	2.374E-12	3.304E-
12	4.825E-12	7.236E-12	1.030E-11	1.407E-11	1.860E-11	
3	2.000E-04	1.702E-13	2.955E-13	4.771E-13	7.323E-13	1.077E-
12	1.687E-12	2.734E-12	4.162E-12	6.031E-12	8.404E-12	
2	1.000E-04	8.853E-14	1.587E-13	2.702E-13	4.311E-13	6.587E-
13	1.076E-12	1.827E-12	2.892E-12	4.328E-12	6.206E-12	
1	0.000E+00	9.586E-07	1.718E-06	2.926E-06	4.668E-06	7.133E-
06	1.165E-05	1.978E-05	3.132E-05	4.687E-05	6.720E-05	
0	X=	4.500E-03	4.800E-03	5.200E-03	5.600E-03	6.000E-
03	6.500E-03	7.000E-03	7.500E-03	8.000E-03	8.500E-03	
0	K=	31	32	33	34	35
36	37	38	39	40		
I	Y					
59	7.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
58	7.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
57	7.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
56	6.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
55	6.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
54	6.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
53	6.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
52	6.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
51	5.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
50	5.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
49	5.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
48	5.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
47	4.900E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
46	4.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	
45	4.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-

40	3.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
39	3.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
38	3.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
37	2.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.089E-01	2.089E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01
36	2.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-01
01	2.089E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.087E-01	2.087E-01
35	2.400E-02	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01	2.088E-01
01	2.088E-01	2.086E-01	2.085E-01	2.083E-01	2.081E-01	2.081E-01	2.081E-01
34	2.200E-02	2.084E-01	2.084E-01	2.084E-01	2.083E-01	2.082E-01	2.082E-01
01	2.077E-01	2.073E-01	2.068E-01	2.065E-01	2.065E-01	2.060E-01	2.060E-01
33	2.000E-02	1.980E-01	1.977E-01	1.977E-01	1.970E-01	1.972E-01	1.984E-01
01	1.998E-01	2.009E-01	2.012E-01	2.013E-01	2.011E-01	2.011E-01	2.011E-01
32	1.950E-02	1.876E-01	1.880E-01	1.890E-01	1.915E-01	1.915E-01	1.945E-01
01	1.970E-01	1.987E-01	1.993E-01	1.996E-01	1.995E-01	1.995E-01	1.995E-01
31	1.850E-02	2.047E-01	2.050E-01	1.617E-01	1.740E-01	1.740E-01	1.837E-01
01	1.899E-01	1.934E-01	1.947E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01
30	1.800E-02	2.033E-01	2.036E-01	2.044E-01	1.643E-01	1.643E-01	1.780E-01
01	1.860E-01	1.905E-01	1.921E-01	1.931E-01	1.931E-01	1.933E-01	1.933E-01
29	1.700E-02	2.000E-01	2.013E-01	2.013E-01	2.013E-01	2.035E-01	1.667E-01
01	1.783E-01	1.844E-01	1.865E-01	1.879E-01	1.881E-01	1.881E-01	1.881E-01
28	1.600E-02	1.971E-01	1.995E-01	1.953E-01	2.002E-01	2.002E-01	1.560E-01
01	1.704E-01	1.777E-01	1.800E-01	1.817E-01	1.820E-01	1.820E-01	1.820E-01
27	1.500E-02	6.528E-02	1.975E-01	1.881E-01	1.963E-01	1.963E-01	2.004E-01
01	1.612E-01	1.696E-01	1.719E-01	1.740E-01	1.743E-01	1.743E-01	1.743E-01
26	1.400E-02	5.395E-02	2.076E-02	7.016E-02	1.928E-01	1.928E-01	1.973E-01
01	1.994E-01	1.586E-01	1.613E-01	1.640E-01	1.646E-01	1.646E-01	1.646E-01
25	1.300E-02	4.485E-02	1.971E-01	4.911E-02	1.916E-01	1.916E-01	1.947E-01
01	1.963E-01	1.972E-01	1.981E-01	1.977E-01	1.965E-01	1.965E-01	1.965E-01
24	1.200E-02	3.482E-02	1.967E-01	2.620E-03	1.959E-01	1.959E-01	1.955E-01
01	1.943E-01	1.928E-01	1.926E-01	1.919E-01	1.904E-01	1.904E-01	1.904E-01
23	1.100E-02	1.889E-02	1.955E-01	3.218E-02	1.978E-01	1.978E-01	1.978E-01
01	1.924E-01	1.867E-01	1.863E-01	1.855E-01	1.823E-01	1.823E-01	1.823E-01
22	1.000E-02	1.907E-01	1.917E-01	5.727E-06	2.890E-02	2.890E-02	4.906E-02
02	6.083E-02	7.027E-02	8.338E-02	9.362E-02	9.809E-02	9.809E-02	9.809E-02
21	9.000E-03	1.846E-01	1.863E-01	1.839E-01	1.906E-01	1.906E-01	4.905E-01
04	1.641E-02	2.799E-02	4.887E-02	6.167E-02	6.908E-02	6.908E-02	6.908E-02
20	8.000E-03	1.751E-01	1.787E-01	1.670E-01	1.784E-01	1.784E-01	1.728E-01
01	1.539E-06	3.438E-06	6.670E-03	2.538E-02	3.591E-02	3.591E-02	3.591E-02
19	6.700E-03	1.605E-01	1.654E-01	1.439E-01	1.547E-01	1.547E-01	1.499E-01
01	1.545E-01	1.484E-01	1.763E-01	1.928E-06	4.135E-06	4.135E-06	4.135E-06
18	5.500E-03	1.503E-01	1.542E-01	1.368E-01	1.464E-01	1.464E-01	1.485E-01
01	1.519E-01	1.517E-01	1.638E-01	1.610E-01	1.567E-01	1.567E-01	1.567E-01
17	4.500E-03	1.693E-08	1.705E-08	1.720E-08	1.447E-01	1.447E-01	1.504E-01
01	1.533E-01	1.585E-01	1.626E-01	1.622E-01	1.642E-01	1.642E-01	1.642E-01
16	3.700E-03	1.300E-08	8.338E-09	1.325E-08	1.509E-08	1.509E-08	1.627E-08
08	1.424E-01	1.523E-01	1.598E-01	1.652E-01	1.683E-01	1.683E-01	1.683E-01
15	3.100E-03	9.857E-09	9.932E-09	1.010E-08	1.142E-08	1.142E-08	1.267E-08
08	1.506E-08	1.723E-08	1.518E-01	1.607E-01	1.658E-01	1.658E-01	1.658E-01
14	2.600E-03	7.183E-09	7.233E-09	7.451E-09	8.457E-09	8.457E-09	9.734E-09
09	1.205E-08	1.459E-08	1.434E-01	1.542E-01	1.608E-01	1.608E-01	1.608E-01
13	2.200E-03	5.107E-09	5.137E-09	5.410E-09	6.257E-09	6.257E-09	7.533E-09
09	9.761E-09	1.254E-08	1.620E-08	1.485E-01	1.561E-01	1.561E-01	1.561E-01
12	1.900E-03	3.660E-09	3.694E-09	3.995E-09	4.771E-09	4.771E-09	6.030E-09
09	8.186E-09	1.108E-08	1.460E-08	1.438E-01	1.523E-01	1.523E-01	1.523E-01
11	1.700E-03	2.792E-09	2.834E-09	3.149E-09	3.890E-09	3.890E-09	5.126E-09
09	7.229E-09	1.016E-08	1.361E-08	1.708E-08	1.498E-01	1.498E-01	1.498E-01
10	1.500E-03	2.032E-09	2.083E-09	2.405E-09	3.110E-09	3.110E-09	4.313E-09
09	6.358E-09	9.298E-09	1.268E-08	1.613E-08	1.471E-01	1.471E-01	1.471E-01
9	1.400E-03	1.711E-09	1.764E-09	2.083E-09	2.768E-09	2.768E-09	3.949E-09
09	5.962E-09	8.899E-09	1.225E-08	1.567E-08	1.458E-01	1.458E-01	1.458E-01
8	1.200E-03	1.171E-09	1.225E-09	1.533E-09	2.175E-09	2.175E-09	3.306E-09
09	5.252E-09	8.174E-09	1.144E-08	1.483E-08	1.432E-01	1.432E-01	1.432E-01

01	2.072E-01	2.069E-01	2.065E-01	2.087E-01		
35	2.400E-02	2.078E-01	2.072E-01	2.066E-01	2.060E-01	2.055E-
01	2.050E-01	2.045E-01	2.040E-01	2.085E-01		
34	2.200E-02	2.055E-01	2.046E-01	2.037E-01	2.027E-01	2.019E-
01	2.011E-01	2.004E-01	1.995E-01	2.082E-01		
33	2.000E-02	2.007E-01	1.996E-01	1.983E-01	1.969E-01	1.957E-
01	1.945E-01	1.933E-01	1.919E-01	2.077E-01		
32	1.950E-02	1.991E-01	1.979E-01	1.965E-01	1.949E-01	1.935E-
01	1.922E-01	1.909E-01	1.892E-01	2.075E-01		
31	1.850E-02	1.952E-01	1.937E-01	1.920E-01	1.900E-01	1.882E-
01	1.866E-01	1.849E-01	1.830E-01	2.071E-01		
30	1.800E-02	1.929E-01	1.913E-01	1.894E-01	1.871E-01	1.850E-
01	1.832E-01	1.814E-01	1.793E-01	2.069E-01		
29	1.700E-02	1.877E-01	1.856E-01	1.833E-01	1.803E-01	1.777E-
01	1.755E-01	1.732E-01	1.708E-01	2.063E-01		
28	1.600E-02	1.814E-01	1.787E-01	1.757E-01	1.719E-01	1.685E-
01	1.659E-01	1.632E-01	1.606E-01	2.056E-01		
27	1.500E-02	1.735E-01	1.700E-01	1.661E-01	1.614E-01	1.573E-
01	1.540E-01	1.846E-01	1.755E-01	2.049E-01		
26	1.400E-02	1.636E-01	1.589E-01	1.539E-01	1.879E-01	1.862E-
01	1.824E-01	1.770E-01	1.681E-01	2.039E-01		
25	1.300E-02	1.943E-01	1.878E-01	1.847E-01	1.811E-01	1.784E-
01	1.748E-01	1.689E-01	1.611E-01	2.029E-01		
24	1.200E-02	1.873E-01	1.790E-01	1.757E-01	1.719E-01	1.110E-
01	1.063E-01	1.040E-01	1.038E-01	2.017E-01		
23	1.100E-02	1.796E-01	1.093E-01	1.015E-01	9.574E-02	9.016E-
02	8.532E-02	8.399E-02	8.592E-02	2.004E-01		
22	1.000E-02	9.595E-02	8.443E-02	7.629E-02	7.118E-02	6.624E-
02	6.172E-02	6.182E-02	6.650E-02	1.990E-01		
21	9.000E-03	6.665E-02	5.465E-02	4.851E-02	4.537E-02	4.216E-
02	3.908E-02	4.092E-02	4.747E-02	1.975E-01		
20	8.000E-03	3.411E-02	2.316E-02	1.837E-02	1.695E-02	1.502E-
02	1.302E-02	1.757E-02	2.757E-02	1.957E-01		
19	6.700E-03	4.182E-06	3.204E-06	3.204E-06	3.549E-06	3.686E-
06	3.744E-06	4.822E-06	6.527E-06	1.929E-01		
18	5.500E-03	1.635E-01	1.595E-01	1.547E-01	1.536E-01	1.530E-
01	1.431E-01	6.373E-07	2.668E-06	1.900E-01		
17	4.500E-03	1.684E-01	1.675E-01	1.663E-01	1.669E-01	1.691E-
01	1.636E-01	1.492E-01	1.175E-01	1.875E-01		
16	3.700E-03	1.701E-01	1.706E-01	1.709E-01	1.713E-01	1.717E-
01	1.670E-01	1.549E-01	1.249E-01	1.858E-01		
15	3.100E-03	1.683E-01	1.704E-01	1.720E-01	1.729E-01	1.733E-
01	1.702E-01	1.621E-01	1.331E-01	1.845E-01		
14	2.600E-03	1.646E-01	1.684E-01	1.712E-01	1.728E-01	1.735E-
01	1.716E-01	1.661E-01	1.393E-01	1.836E-01		
13	2.200E-03	1.610E-01	1.662E-01	1.701E-01	1.725E-01	1.737E-
01	1.729E-01	1.692E-01	1.464E-01	1.829E-01		
12	1.900E-03	1.582E-01	1.645E-01	1.694E-01	1.724E-01	1.742E-
01	1.744E-01	1.726E-01	1.550E-01	1.824E-01		
11	1.700E-03	1.564E-01	1.634E-01	1.687E-01	1.722E-01	1.743E-
01	1.751E-01	1.743E-01	1.605E-01	1.821E-01		
10	1.500E-03	1.545E-01	1.622E-01	1.681E-01	1.719E-01	1.743E-
01	1.757E-01	1.759E-01	1.662E-01	1.819E-01		
9	1.400E-03	1.536E-01	1.616E-01	1.677E-01	1.716E-01	1.741E-
01	1.756E-01	1.759E-01	1.669E-01	1.818E-01		
8	1.200E-03	1.519E-01	1.605E-01	1.666E-01	1.704E-01	1.727E-
01	1.737E-01	1.732E-01	1.615E-01	1.815E-01		
7	1.000E-03	1.504E-01	1.596E-01	1.659E-01	1.699E-01	1.724E-
01	1.735E-01	1.733E-01	1.629E-01	1.814E-01		
6	8.000E-04	1.492E-01	1.588E-01	1.655E-01	1.696E-01	1.723E-
01	1.736E-01	1.737E-01	1.652E-01	1.812E-01		
5	6.000E-04	1.481E-01	1.582E-01	1.652E-01	1.696E-01	1.724E-
01	1.740E-01	1.747E-01	1.685E-01	1.811E-01		
4	4.000E-04	1.473E-01	1.578E-01	1.651E-01	1.698E-01	1.728E-
01	1.748E-01	1.761E-01	1.730E-01	1.810E-01		
3	2.000E-04	1.468E-01	1.575E-01	1.651E-01	1.700E-01	1.732E-

7	1.000E-03	7.731E-10	8.232E-10	1.110E-09	1.706E-09	2.784E-
09	4.662E-09	7.555E-09	1.076E-08	1.412E-08	1.725E-08	
6	8.000E-04	4.962E-10	5.401E-10	7.990E-10	1.349E-09	2.374E-
09	4.190E-09	7.048E-09	1.019E-08	1.356E-08	1.690E-08	
5	6.000E-04	3.170E-10	3.531E-10	5.811E-10	1.090E-09	2.068E-
09	3.832E-09	6.659E-09	9.759E-09	1.311E-08	1.647E-08	
4	4.000E-04	2.080E-10	2.379E-10	4.394E-10	9.146E-10	1.857E-
09	3.579E-09	6.382E-09	9.451E-09	1.279E-08	1.614E-08	
3	2.000E-04	1.500E-10	1.758E-10	3.605E-10	8.142E-10	1.734E-
09	3.433E-09	6.219E-09	9.268E-09	1.260E-08	1.594E-08	
2	1.000E-04	1.360E-10	1.608E-10	3.413E-10	7.896E-10	1.704E-
09	3.397E-09	6.178E-09	9.223E-09	1.255E-08	1.589E-08	
1	0.000E+00	1.472E-03	1.741E-03	3.695E-03	8.488E-03	1.801E-
02	3.480E-02	6.023E-02	8.538E-02	1.101E-01	1.325E-01	
0		X=	8.000E-02	9.500E-02	1.100E-01	1.250E-01
01	1.450E-01	1.550E-01	1.650E-01	1.750E-01		
0		K=	51	52	53	54
56			57	58		55
	I	Y				
59	7.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
58	7.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
57	7.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
56	6.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
55	6.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
54	6.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
53	6.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
52	6.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
51	5.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
50	5.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
49	5.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
48	5.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
47	4.900E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
46	4.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
45	4.400E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
44	4.200E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
43	4.000E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
42	3.800E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.089E-01	2.089E-01	2.089E-01		
41	3.600E-02	2.089E-01	2.089E-01	2.089E-01	2.089E-01	2.089E-
01	2.089E-01	2.088E-01	2.088E-01	2.089E-01		
40	3.400E-02	2.089E-01	2.089E-01	2.089E-01	2.088E-01	2.088E-
01	2.088E-01	2.088E-01	2.088E-01	2.089E-01		
39	3.200E-02	2.089E-01	2.089E-01	2.088E-01	2.088E-01	2.088E-
01	2.088E-01	2.088E-01	2.087E-01	2.089E-01		
38	3.000E-02	2.088E-01	2.088E-01	2.088E-01	2.087E-01	2.087E-
01	2.086E-01	2.086E-01	2.085E-01	2.088E-01		
37	2.800E-02	2.088E-01	2.087E-01	2.086E-01	2.085E-01	2.083E-
01	2.082E-01	2.080E-01	2.078E-01	2.088E-01		
36	2.600E-02	2.086E-01	2.083E-01	2.080E-01	2.077E-01	2.075E-

	03	1.500E-03	1.600E-03	1.700E-03	1.800E-03	1.900E-03	
0		K=	11	12	13	14	15
16		17	18	19	20		
I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
57	7.000E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
56	6.800E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
55	6.600E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
54	6.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
53	6.200E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
52	6.000E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
51	5.800E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
50	5.600E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
49	5.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
48	5.200E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
47	4.900E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
46	4.600E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	
45	4.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
44	4.200E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
43	4.000E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
42	3.800E-02	1.798E+01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
41	3.600E-02	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
40	3.400E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
39	3.200E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
38	3.000E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
37	2.800E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
36	2.600E-02	1.798E+01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
35	2.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.799E+01	1.799E+01	1.799E+01	1.799E+01	
34	2.200E-02	1.801E+01	1.801E+01	1.801E+01	1.801E+01	1.801E+01	1.801E+
01	1.801E+01	1.801E+01	1.801E+01	1.801E+01	1.801E+01	1.801E+01	
33	2.000E-02	1.805E+01	1.804E+01	1.803E+01	1.803E+01	1.803E+01	1.802E+
01	1.801E+01	1.800E+01	1.799E+01	1.798E+01	1.797E+01	1.797E+01	
32	1.950E-02	1.834E+01	1.840E+01	1.844E+01	1.849E+01	1.853E+01	1.853E+
01	1.857E+01	1.861E+01	1.864E+01	1.867E+01	1.870E+01	1.870E+01	
31	1.850E-02	2.988E+00	3.161E+00	3.330E+00	3.497E+00	3.659E+00	3.659E+
00	3.820E+00	3.979E+00	4.133E+00	4.287E+00	4.438E+00	4.438E+00	
30	1.800E-02	3.545E-01	4.515E-01	5.482E-01	6.451E-01	7.424E-01	7.424E-
01	8.402E-01	9.384E-01	1.037E+00	1.136E+00	1.235E+00	1.235E+00	
29	1.700E-02	5.611E-02	8.657E-02	1.199E-01	1.581E-01	1.937E-01	1.937E-
01	2.346E-01	2.768E-01	2.968E-01	3.330E-01	3.636E-01	3.636E-01	

01	1.807E+01	1.807E+01	1.807E+01	1.806E+01	1.806E+01		
32	1.950E-02	0.000E+00	0.000E+00	1.770E+01	1.779E+01	1.789E+	
01	1.799E+01	1.807E+01	1.815E+01	1.822E+01	1.828E+01		
31	1.850E-02	0.000E+00	0.000E+00	1.386E+00	1.677E+00	1.893E+	
00	2.090E+00	2.280E+00	2.465E+00	2.647E+00	2.813E+00		
30	1.800E-02	0.000E+00	0.000E+00	-4.158E-01	-3.187E-01	-2.129E-	
01	-1.122E-01	-1.403E-02	8.267E-02	2.157E-01	3.110E-01		
29	1.700E-02	0.000E+00	0.000E+00	-1.551E-01	-1.506E-01	-1.297E-	
01	-1.040E-01	-7.626E-02	-5.103E-02	-2.303E-02	2.597E-02		
28	1.600E-02	0.000E+00	0.000E+00	-1.095E-01	-1.428E-01	-1.551E-	
01	-1.690E-01	-1.746E-01	-1.638E-01	-1.637E-01	-1.480E-01		
27	1.500E-02	0.000E+00	0.000E+00	-3.725E-02	-6.343E-02	-8.849E-	
02	-1.182E-01	-1.348E-01	-1.537E-01	-1.650E-01	-1.785E-01		
26	1.400E-02	0.000E+00	0.000E+00	-2.526E-02	-5.449E-02	-9.135E-	
02	-1.225E-01	-1.478E-01	-1.804E-01	-1.997E-01	-2.229E-01		
25	1.300E-02	0.000E+00	0.000E+00	-5.464E-02	-1.015E-01	-1.521E-	
01	-1.941E-01	-2.342E-01	-2.773E-01	-3.131E-01	-3.457E-01		
24	1.200E-02	0.000E+00	0.000E+00	-1.287E-01	-2.007E-01	-2.685E-	
01	-3.229E-01	-3.788E-01	-4.266E-01	-4.739E-01	-5.158E-01		
23	1.100E-02	0.000E+00	0.000E+00	-2.505E-01	-3.255E-01	-3.966E-	
01	-4.622E-01	-5.243E-01	-5.867E-01	-6.475E-01	-7.079E-01		
22	1.000E-02	0.000E+00	0.000E+00	-5.858E-02	-1.104E-01	-1.628E-	
01	-2.130E-01	-2.631E-01	-3.057E-01	-3.493E-01	-3.863E-01		
21	9.000E-03	0.000E+00	0.000E+00	4.980E-02	1.635E-02	-1.925E-	
02	-5.447E-02	-8.850E-02	-1.221E-01	-1.536E-01	-1.834E-01		
20	8.000E-03	0.000E+00	0.000E+00	-4.536E-02	-8.022E-02	-1.153E-	
01	-1.486E-01	-1.806E-01	-2.120E-01	-2.433E-01	-2.720E-01		
19	6.700E-03	0.000E+00	0.000E+00	-1.154E-01	-1.581E-01	-1.960E-	
01	-2.309E-01	-2.629E-01	-2.945E-01	-3.249E-01	-3.567E-01		
18	5.500E-03	0.000E+00	0.000E+00	-1.539E-01	-1.912E-01	-2.194E-	
01	-2.455E-01	-2.708E-01	-2.971E-01	-3.231E-01	-3.433E-01		
17	4.500E-03	0.000E+00	0.000E+00	-6.877E-02	-3.471E-02	-8.681E-	
03	8.184E-03	1.877E-02	2.442E-02	4.938E-02	1.694E-01		
16	3.700E-03	0.000E+00	0.000E+00	6.779E-01	1.008E+00	1.226E+	
00	1.390E+00	1.519E+00	1.624E+00	1.709E+00	1.742E+00		
15	3.100E-03	0.000E+00	0.000E+00	-7.028E-03	1.023E-01	1.698E-	
01	2.294E-01	2.829E-01	3.300E-01	3.741E-01	4.166E-01		
14	2.600E-03	0.000E+00	0.000E+00	3.818E-01	5.633E-01	6.774E-	
01	7.856E-01	8.755E-01	9.344E-01	9.836E-01	1.029E+00		
13	2.200E-03	0.000E+00	0.000E+00	2.151E+00	2.291E+00	2.361E+	
00	2.434E+00	2.523E+00	2.612E+00	2.699E+00	2.789E+00		
12	1.900E-03	0.000E+00	0.000E+00	6.013E+00	6.291E+00	6.508E+	
00	6.718E+00	6.916E+00	7.119E+00	7.322E+00	7.522E+00		
11	1.700E-03	0.000E+00	0.000E+00	1.219E+01	1.363E+01	1.449E+	
01	1.520E+01	1.581E+01	1.633E+01	1.681E+01	1.724E+01		
10	1.500E-03	0.000E+00	0.000E+00	4.937E+01	4.949E+01	4.976E+	
01	5.004E+01	5.031E+01	5.056E+01	5.079E+01	5.096E+01		
9	1.400E-03	0.000E+00	0.000E+00	5.539E+01	5.517E+01	5.511E+	
01	5.510E+01	5.512E+01	5.516E+01	5.523E+01	5.530E+01		
8	1.200E-03	0.000E+00	0.000E+00	5.994E+01	5.972E+01	5.961E+	
01	5.949E+01	5.937E+01	5.926E+01	5.915E+01	5.905E+01		
7	1.000E-03	0.000E+00	0.000E+00	6.169E+01	6.155E+01	6.148E+	
01	6.140E+01	6.130E+01	6.119E+01	6.108E+01	6.096E+01		
6	8.000E-04	0.000E+00	0.000E+00	6.239E+01	6.233E+01	6.230E+	
01	6.225E+01	6.219E+01	6.211E+01	6.202E+01	6.192E+01		
5	6.000E-04	0.000E+00	0.000E+00	6.280E+01	6.281E+01	6.282E+	
01	6.280E+01	6.277E+01	6.271E+01	6.264E+01	6.255E+01		
4	4.000E-04	0.000E+00	0.000E+00	6.345E+01	6.356E+01	6.361E+	
01	6.363E+01	6.363E+01	6.359E+01	6.353E+01	6.345E+01		
3	2.000E-04	0.000E+00	0.000E+00	6.542E+01	6.569E+01	6.583E+	
01	6.594E+01	6.598E+01	6.598E+01	6.593E+01	6.586E+01		
2	1.000E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0		X=	1.000E-03	1.100E-03	1.200E-03	1.300E-03	1.400E-

01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	
56	6.800E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.797E+01	1.797E+01	
55	6.600E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
54	6.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
53	6.200E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
52	6.000E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
51	5.800E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
50	5.600E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
49	5.400E-02	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
48	5.200E-02	1.798E+01	1.798E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
47	4.900E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
46	4.600E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
45	4.400E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
44	4.200E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
43	4.000E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
42	3.800E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	
41	3.600E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	
40	3.400E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.796E+01	
39	3.200E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	
38	3.000E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	
37	2.800E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.795E+01	
36	2.600E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+
01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.795E+01	
35	2.400E-02	1.799E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+01	1.798E+
01	1.798E+01	1.797E+01	1.797E+01	1.796E+01	1.795E+01	1.795E+01	
34	2.200E-02	1.801E+01	1.800E+01	1.800E+01	1.800E+01	1.799E+01	1.798E+
01	1.798E+01	1.797E+01	1.795E+01	1.794E+01	1.792E+01	1.792E+01	
33	2.000E-02	1.797E+01	1.796E+01	1.795E+01	1.795E+01	1.793E+01	1.792E+
01	1.792E+01	1.791E+01	1.790E+01	1.789E+01	1.788E+01	1.788E+01	
32	1.950E-02	1.873E+01	1.876E+01	1.880E+01	1.883E+01	1.885E+01	1.885E+
01	1.888E+01	1.890E+01	1.891E+01	1.890E+01	1.888E+01	1.888E+01	
31	1.850E-02	4.586E+00	4.800E+00	5.072E+00	5.344E+00	5.593E+00	5.593E+
00	5.838E+00	6.127E+00	6.448E+00	6.752E+00	7.040E+00	7.040E+00	
30	1.800E-02	1.673E+00	1.821E+00	2.610E+00	2.786E+00	1.919E+00	1.919E+
00	2.089E+00	2.267E+00	2.526E+00	2.767E+00	3.022E+00	3.022E+00	
29	1.700E-02	4.102E-01	5.487E-01	6.938E-01	1.410E+00	1.896E+00	1.896E+
00	2.088E+00	2.180E+00	2.459E+00	3.353E+00	3.388E+00	3.388E+00	
28	1.600E-02	-1.330E-01	-1.227E-01	-1.080E-01	-6.136E-02	2.969E-02	2.969E-
02	9.319E-02	1.960E-01	4.590E-01	7.899E-01	9.677E-01	9.677E-01	
27	1.500E-02	-2.236E-01	-2.284E-01	-2.323E-01	-2.236E-01	-2.232E-01	-2.232E-
01	-2.128E-01	-2.147E-01	-1.797E-01	-4.155E-02	4.748E-04	4.748E-04	
26	1.400E-02	-3.181E-01	-3.622E-01	-3.746E-01	-3.852E-01	-3.812E-01	-3.812E-
01	-3.808E-01	-3.828E-01	-3.835E-01	-3.663E-01	-3.495E-01	-3.495E-01	
25	1.300E-02	-5.588E-01	-6.165E-01	-6.629E-01	-6.869E-01	-7.055E-01	-7.055E-
01	-7.429E-01	-7.767E-01	-7.935E-01	-8.035E-01	-8.108E-01	-8.108E-01	
24	1.200E-02	-8.979E-01	-9.929E-01	-1.061E+00	-1.105E+00	-1.156E+00	-1.156E+

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00 -1.226E+00 -1.290E+00 -1.358E+00 -1.411E+00 -1.448E+00
23 1.100E-02 -1.233E+00 -1.353E+00 -1.461E+00 -1.536E+00 -1.594E+
00 -1.689E+00 -1.821E+00 -1.929E+00 -2.017E+00 -2.101E+00
22 1.000E-02 -7.861E-01 -8.763E-01 -9.548E-01 -1.009E+00 -1.056E+
00 -1.128E+00 -1.225E+00 -1.307E+00 -1.371E+00 -1.424E+00
21 9.000E-03 -4.541E-01 -5.154E-01 -5.680E-01 -6.005E-01 -6.395E-
01 -6.856E-01 -7.471E-01 -8.059E-01 -8.407E-01 -8.682E-01
20 8.000E-03 -5.578E-01 -6.291E-01 -6.848E-01 -7.217E-01 -7.527E-
01 -8.001E-01 -8.774E-01 -9.448E-01 -9.885E-01 -1.025E+00
19 6.700E-03 -6.666E-01 -7.446E-01 -8.053E-01 -8.473E-01 -8.854E-
01 -9.431E-01 -1.025E+00 -1.089E+00 -1.136E+00 -1.180E+00
18 5.500E-03 -5.701E-01 -6.244E-01 -6.689E-01 -6.981E-01 -7.261E-
01 -7.650E-01 -8.260E-01 -8.872E-01 -9.235E-01 -9.580E-01
17 4.500E-03 2.716E-01 2.614E-01 2.511E-01 2.411E-01 2.308E-
01 2.185E-01 2.063E-01 1.923E-01 1.807E-01 1.640E-01
16 3.700E-03 1.754E+00 1.757E+00 1.768E+00 1.778E+00 1.774E+
00 1.774E+00 1.781E+00 1.788E+00 1.804E+00 1.822E+00
15 3.100E-03 7.567E-01 7.973E-01 8.521E-01 9.083E-01 9.658E-
01 1.024E+00 1.100E+00 1.191E+00 1.285E+00 1.378E+00
14 2.600E-03 1.558E+00 1.638E+00 1.638E+00 1.747E+00 1.855E+00 1.964E+
00 2.077E+00 2.218E+00 2.388E+00 2.559E+00 2.732E+00
13 2.200E-03 3.861E+00 4.017E+00 4.227E+00 4.430E+00 4.634E+
00 4.838E+00 5.095E+00 5.402E+00 5.709E+00 6.016E+00
12 1.900E-03 9.602E+00 9.876E+00 1.024E+01 1.059E+01 1.094E+
01 1.129E+01 1.171E+01 1.221E+01 1.270E+01 1.317E+01
11 1.700E-03 2.089E+01 2.130E+01 2.182E+01 2.231E+01 2.277E+
01 2.322E+01 2.375E+01 2.433E+01 2.488E+01 2.540E+01
10 1.500E-03 5.131E+01 5.129E+01 5.116E+01 5.101E+01 5.088E+
01 5.072E+01 5.047E+01 5.020E+01 4.992E+01 4.965E+01
9 1.400E-03 5.586E+01 5.589E+01 5.584E+01 5.577E+01 5.569E+
01 5.567E+01 5.560E+01 5.534E+01 5.507E+01 5.481E+01
8 1.200E-03 5.841E+01 5.840E+01 5.835E+01 5.830E+01 5.826E+
01 5.825E+01 5.823E+01 5.818E+01 5.810E+01 5.790E+01
7 1.000E-03 5.974E+01 5.962E+01 5.946E+01 5.931E+01 5.917E+
01 5.907E+01 5.894E+01 5.881E+01 5.868E+01 5.852E+01
6 8.000E-04 6.063E+01 6.047E+01 6.026E+01 6.006E+01 5.987E+
01 5.969E+01 5.949E+01 5.924E+01 5.904E+01 5.884E+01
5 6.000E-04 6.130E+01 6.114E+01 6.091E+01 6.069E+01 6.048E+
01 6.027E+01 6.003E+01 5.974E+01 5.948E+01 5.924E+01
4 4.000E-04 6.217E+01 6.199E+01 6.175E+01 6.151E+01 6.128E+
01 6.105E+01 6.078E+01 6.049E+01 6.020E+01 5.989E+01
3 2.000E-04 6.431E+01 6.409E+01 6.379E+01 6.351E+01 6.323E+
01 6.295E+01 6.262E+01 6.226E+01 6.192E+01 6.157E+01
2 1.000E-04 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
1 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
0 X= 4.500E-03 4.800E-03 5.200E-03 5.600E-03 6.000E-
03 6.500E-03 7.000E-03 7.500E-03 8.000E-03 8.500E-03
0 K= 31 32 33 34 35
36 37 38 39 40
I Y
59 7.600E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
58 7.200E-02 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+
00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
57 7.000E-02 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01
56 6.800E-02 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01
55 6.600E-02 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01
54 6.400E-02 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01
53 6.200E-02 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01
01 1.797E+01 1.797E+01 1.797E+01 1.797E+01 1.797E+01

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52	6.000E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
51	5.800E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
50	5.600E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.796E+01
49	5.400E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.796E+01
48	5.200E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
47	4.900E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
46	4.600E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
45	4.400E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.797E+01
01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.795E+01	1.795E+01
44	4.200E-02	1.797E+01	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.796E+01
01	1.796E+01	1.796E+01	1.795E+01	1.795E+01	1.795E+01	1.795E+01	1.795E+01
43	4.000E-02	1.797E+01	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
01	1.796E+01	1.795E+01	1.795E+01	1.795E+01	1.794E+01	1.794E+01	1.794E+01
42	3.800E-02	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
01	1.795E+01	1.795E+01	1.795E+01	1.794E+01	1.794E+01	1.794E+01	1.794E+01
41	3.600E-02	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.796E+01
01	1.795E+01	1.795E+01	1.794E+01	1.794E+01	1.793E+01	1.793E+01	1.793E+01
40	3.400E-02	1.796E+01	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.795E+01
01	1.794E+01	1.794E+01	1.793E+01	1.793E+01	1.792E+01	1.792E+01	1.792E+01
39	3.200E-02	1.796E+01	1.795E+01	1.795E+01	1.795E+01	1.795E+01	1.795E+01
01	1.794E+01	1.793E+01	1.792E+01	1.792E+01	1.791E+01	1.791E+01	1.791E+01
38	3.000E-02	1.795E+01	1.795E+01	1.795E+01	1.795E+01	1.794E+01	1.794E+01
01	1.793E+01	1.792E+01	1.791E+01	1.790E+01	1.789E+01	1.789E+01	1.789E+01
37	2.800E-02	1.795E+01	1.794E+01	1.794E+01	1.794E+01	1.793E+01	1.793E+01
01	1.791E+01	1.790E+01	1.789E+01	1.788E+01	1.786E+01	1.786E+01	1.786E+01
36	2.600E-02	1.795E+01	1.794E+01	1.793E+01	1.792E+01	1.792E+01	1.792E+01
01	1.790E+01	1.788E+01	1.786E+01	1.785E+01	1.783E+01	1.783E+01	1.783E+01
35	2.400E-02	1.794E+01	1.793E+01	1.792E+01	1.790E+01	1.790E+01	1.789E+01
01	1.787E+01	1.785E+01	1.782E+01	1.780E+01	1.777E+01	1.777E+01	1.777E+01
34	2.200E-02	1.790E+01	1.788E+01	1.786E+01	1.784E+01	1.784E+01	1.781E+01
01	1.778E+01	1.774E+01	1.771E+01	1.767E+01	1.764E+01	1.764E+01	1.764E+01
33	2.000E-02	1.788E+01	1.787E+01	1.786E+01	1.785E+01	1.785E+01	1.784E+01
01	1.782E+01	1.780E+01	1.777E+01	1.774E+01	1.771E+01	1.771E+01	1.771E+01
32	1.950E-02	1.885E+01	1.881E+01	1.875E+01	1.868E+01	1.868E+01	1.859E+01
01	1.847E+01	1.833E+01	1.817E+01	1.800E+01	1.782E+01	1.782E+01	1.782E+01
31	1.850E-02	7.307E+00	7.562E+00	7.841E+00	8.112E+00	8.112E+00	8.361E+00
00	8.607E+00	8.820E+00	9.003E+00	9.143E+00	9.210E+00	9.210E+00	9.210E+00
30	1.800E-02	3.277E+00	3.537E+00	3.844E+00	4.198E+00	4.198E+00	4.567E+00
00	4.965E+00	5.407E+00	5.785E+00	6.152E+00	6.511E+00	6.511E+00	6.511E+00
29	1.700E-02	4.460E+00	4.262E+00	4.064E+00	4.329E+00	4.329E+00	3.762E+00
00	3.250E+00	2.480E+00	2.357E+00	2.693E+00	3.034E+00	3.034E+00	3.034E+00
28	1.600E-02	1.408E+00	1.579E+00	2.939E+00	2.697E+00	2.697E+00	2.691E+00
00	3.112E+00	3.137E+00	3.461E+00	3.477E+00	1.914E+00	1.914E+00	1.914E+00
27	1.500E-02	2.724E-01	3.594E-01	6.504E-01	9.153E-01	9.153E-01	1.416E+00
00	1.534E+00	1.645E+00	1.887E+00	1.965E+00	1.981E+00	1.981E+00	1.981E+00
26	1.400E-02	-2.215E-01	-2.848E-01	-1.799E-01	-1.452E-01	-1.452E-01	-3.357E-01
02	4.725E-02	1.908E-01	3.038E-01	4.252E-01	5.104E-01	5.104E-01	5.104E-01
25	1.300E-02	-8.072E-01	-1.068E+00	-1.507E+00	-1.258E+00	-1.258E+00	-1.488E+00
00	-1.883E+00	-1.815E+00	-2.118E+00	-1.955E+00	-2.003E+00	-2.003E+00	-2.003E+00
24	1.200E-02	-1.480E+00	-1.526E+00	-1.681E+00	-1.964E+00	-1.964E+00	-2.841E+00
00	-3.599E+00	-3.237E+00	-4.302E+00	-4.469E+00	-4.215E+00	-4.215E+00	-4.215E+00
23	1.100E-02	-2.187E+00	-2.280E+00	-2.391E+00	-2.460E+00	-2.460E+00	-2.636E+00
00	-3.223E+00	-3.797E+00	-4.230E+00	-5.881E+00	-5.973E+00	-5.973E+00	-5.973E+00
22	1.000E-02	-1.472E+00	-1.531E+00	-1.617E+00	-1.681E+00	-1.681E+00	-1.747E+00
00	-1.827E+00	-1.861E+00	-1.890E+00	-1.921E+00	-1.964E+00	-1.964E+00	-1.964E+00
21	9.000E-03	-8.940E-01	-9.328E-01	-9.846E-01	-1.006E+00	-1.006E+00	-1.032E+00
00	-1.068E+00	-1.102E+00	-1.104E+00	-1.095E+00	-1.077E+00	-1.077E+00	-1.077E+00
20	8.000E-03	-1.069E+00	-1.117E+00	-1.172E+00	-1.219E+00	-1.219E+00	-1.257E+00
00	-1.305E+00	-1.332E+00	-1.337E+00	-1.359E+00	-1.372E+00	-1.372E+00	-1.372E+00

19	6.700E-03	-1.219E+00	-1.277E+00	-1.350E+00	-1.401E+00	-1.448E+00	
00	-1.509E+00	-1.560E+00	-1.591E+00	-1.611E+00	-1.631E+00		
18	5.500E-03	-9.909E-01	-1.038E+00	-1.094E+00	-1.134E+00	-1.195E+00	
00	-1.255E+00	-1.292E+00	-1.329E+00	-1.347E+00	-1.355E+00		
17	4.500E-03	1.540E-01	1.373E-01	1.083E-01	8.529E-02	6.055E-02	
02	3.016E-02	3.779E-03	-2.294E-02	-6.095E-02	-1.025E-01		
16	3.700E-03	1.838E+00	1.857E+00	1.884E+00	1.920E+00	1.957E+00	
00	2.007E+00	2.061E+00	2.125E+00	2.203E+00	2.281E+00		
15	3.100E-03	1.472E+00	1.569E+00	1.682E+00	1.812E+00	1.943E+00	
00	2.097E+00	2.269E+00	2.442E+00	2.615E+00	2.795E+00		
14	2.600E-03	2.906E+00	3.080E+00	3.283E+00	3.515E+00	3.748E+00	
00	4.010E+00	4.301E+00	4.594E+00	4.886E+00	5.179E+00		
13	2.200E-03	6.312E+00	6.605E+00	6.950E+00	7.337E+00	7.719E+00	
00	8.144E+00	8.607E+00	9.061E+00	9.494E+00	9.920E+00		
12	1.900E-03	1.363E+01	1.408E+01	1.459E+01	1.515E+01	1.568E+01	
01	1.624E+01	1.683E+01	1.740E+01	1.794E+01	1.844E+01		
11	1.700E-03	2.585E+01	2.628E+01	2.677E+01	2.728E+01	2.774E+01	
01	2.822E+01	2.867E+01	2.906E+01	2.937E+01	2.964E+01		
10	1.500E-03	4.938E+01	4.912E+01	4.879E+01	4.836E+01	4.796E+01	
01	4.755E+01	4.709E+01	4.666E+01	4.623E+01	4.578E+01		
9	1.400E-03	5.454E+01	5.429E+01	5.399E+01	5.361E+01	5.319E+01	
01	5.272E+01	5.222E+01	5.173E+01	5.120E+01	5.065E+01		
8	1.200E-03	5.771E+01	5.757E+01	5.740E+01	5.716E+01	5.693E+01	
01	5.666E+01	5.627E+01	5.586E+01	5.544E+01	5.501E+01		
7	1.000E-03	5.832E+01	5.817E+01	5.802E+01	5.783E+01	5.766E+01	
01	5.744E+01	5.714E+01	5.678E+01	5.640E+01	5.604E+01		
6	8.000E-04	5.862E+01	5.839E+01	5.814E+01	5.789E+01	5.765E+01	
01	5.740E+01	5.711E+01	5.682E+01	5.647E+01	5.612E+01		
5	6.000E-04	5.897E+01	5.873E+01	5.841E+01	5.806E+01	5.777E+01	
01	5.744E+01	5.708E+01	5.673E+01	5.638E+01	5.597E+01		
4	4.000E-04	5.960E+01	5.931E+01	5.896E+01	5.856E+01	5.820E+01	
01	5.782E+01	5.740E+01	5.699E+01	5.657E+01	5.609E+01		
3	2.000E-04	6.123E+01	6.087E+01	6.046E+01	6.003E+01	5.960E+01	
01	5.914E+01	5.863E+01	5.814E+01	5.759E+01	5.701E+01		
2	1.000E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0		X=	9.000E-03	9.500E-03	1.000E-02	1.500E-02	2.000E-02
02	3.000E-02	4.000E-02	5.500E-02	6.000E-02	7.500E-02		
0		K=	41	42	43	44	45
46		47	48	49	50		
I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
57	7.000E-02	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.795E+01	1.795E+01
01	1.792E+01	1.787E+01	1.780E+01	1.776E+01	1.772E+01		
56	6.800E-02	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.795E+01	1.795E+01
01	1.792E+01	1.787E+01	1.781E+01	1.776E+01	1.773E+01		
55	6.600E-02	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.794E+01	1.794E+01
01	1.791E+01	1.787E+01	1.780E+01	1.776E+01	1.773E+01		
54	6.400E-02	1.797E+01	1.797E+01	1.797E+01	1.796E+01	1.794E+01	1.794E+01
01	1.791E+01	1.786E+01	1.780E+01	1.776E+01	1.772E+01		
53	6.200E-02	1.797E+01	1.797E+01	1.796E+01	1.796E+01	1.794E+01	1.794E+01
01	1.791E+01	1.785E+01	1.779E+01	1.775E+01	1.771E+01		
52	6.000E-02	1.797E+01	1.796E+01	1.796E+01	1.796E+01	1.794E+01	1.794E+01
01	1.790E+01	1.785E+01	1.778E+01	1.774E+01	1.770E+01		
51	5.800E-02	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.793E+01	1.793E+01
01	1.790E+01	1.784E+01	1.777E+01	1.772E+01	1.769E+01		
50	5.600E-02	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.793E+01	1.793E+01
01	1.789E+01	1.782E+01	1.775E+01	1.771E+01	1.767E+01		
49	5.400E-02	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.792E+01	1.792E+01
01	1.788E+01	1.781E+01	1.773E+01	1.769E+01	1.765E+01		
48	5.200E-02	1.796E+01	1.796E+01	1.796E+01	1.795E+01	1.792E+01	1.792E+01

01	1.787E+01	1.779E+01	1.771E+01	1.767E+01	1.763E+01	
47	4.900E-02	1.796E+01	1.796E+01	1.795E+01	1.794E+01	1.791E+
01	1.785E+01	1.777E+01	1.768E+01	1.764E+01	1.760E+01	
46	4.600E-02	1.795E+01	1.795E+01	1.795E+01	1.793E+01	1.789E+
01	1.782E+01	1.773E+01	1.764E+01	1.759E+01	1.756E+01	
45	4.400E-02	1.795E+01	1.795E+01	1.794E+01	1.793E+01	1.788E+
01	1.780E+01	1.770E+01	1.761E+01	1.756E+01	1.752E+01	
44	4.200E-02	1.795E+01	1.794E+01	1.794E+01	1.792E+01	1.787E+
01	1.778E+01	1.767E+01	1.757E+01	1.752E+01	1.748E+01	
43	4.000E-02	1.794E+01	1.794E+01	1.793E+01	1.791E+01	1.785E+
01	1.775E+01	1.763E+01	1.752E+01	1.748E+01	1.744E+01	
42	3.800E-02	1.793E+01	1.793E+01	1.792E+01	1.789E+01	1.782E+
01	1.771E+01	1.758E+01	1.747E+01	1.743E+01	1.739E+01	
41	3.600E-02	1.792E+01	1.792E+01	1.791E+01	1.788E+01	1.779E+
01	1.766E+01	1.752E+01	1.741E+01	1.737E+01	1.734E+01	
40	3.400E-02	1.791E+01	1.791E+01	1.790E+01	1.786E+01	1.776E+
01	1.761E+01	1.746E+01	1.735E+01	1.730E+01	1.727E+01	
39	3.200E-02	1.790E+01	1.789E+01	1.788E+01	1.783E+01	1.771E+
01	1.754E+01	1.738E+01	1.727E+01	1.723E+01	1.720E+01	
38	3.000E-02	1.788E+01	1.787E+01	1.786E+01	1.779E+01	1.765E+
01	1.746E+01	1.729E+01	1.718E+01	1.714E+01	1.712E+01	
37	2.800E-02	1.785E+01	1.784E+01	1.782E+01	1.774E+01	1.757E+
01	1.736E+01	1.718E+01	1.707E+01	1.705E+01	1.703E+01	
36	2.600E-02	1.781E+01	1.779E+01	1.777E+01	1.767E+01	1.747E+
01	1.724E+01	1.706E+01	1.696E+01	1.693E+01	1.692E+01	
35	2.400E-02	1.775E+01	1.772E+01	1.770E+01	1.757E+01	1.734E+
01	1.709E+01	1.690E+01	1.681E+01	1.680E+01	1.679E+01	
34	2.200E-02	1.760E+01	1.757E+01	1.755E+01	1.739E+01	1.712E+
01	1.686E+01	1.670E+01	1.666E+01	1.666E+01	1.666E+01	
33	2.000E-02	1.768E+01	1.765E+01	1.766E+01	1.743E+01	1.707E+
01	1.672E+01	1.651E+01	1.645E+01	1.643E+01	1.641E+01	
32	1.950E-02	1.761E+01	1.739E+01	1.710E+01	1.699E+01	1.679E+
01	1.650E+01	1.632E+01	1.627E+01	1.626E+01	1.623E+01	
31	1.850E-02	9.215E+00	9.193E+00	1.098E+01	1.288E+01	1.378E+
01	1.454E+01	1.505E+01	1.543E+01	1.555E+01	1.561E+01	
30	1.800E-02	6.873E+00	7.243E+00	7.689E+00	9.774E+00	1.138E+
01	1.306E+01	1.410E+01	1.480E+01	1.503E+01	1.517E+01	
29	1.700E-02	3.387E+00	3.706E+00	4.040E+00	5.448E+00	6.772E+
00	1.032E+01	1.193E+01	1.321E+01	1.368E+01	1.404E+01	
28	1.600E-02	1.313E+00	1.348E+00	1.550E+00	2.965E+00	5.490E+
00	7.370E+00	9.512E+00	1.139E+01	1.214E+01	1.271E+01	
27	1.500E-02	1.809E+00	8.593E-01	1.051E+00	2.402E+00	3.657E+
00	5.143E+00	7.086E+00	9.541E+00	1.049E+01	1.122E+01	
26	1.400E-02	6.249E-01	4.052E-01	6.121E-01	7.967E-01	1.859E+
00	3.788E+00	5.519E+00	7.921E+00	8.723E+00	9.475E+00	
25	1.300E-02	-1.855E+00	-8.217E-01	-7.464E-01	-3.999E-01	7.143E-
01	2.382E+00	4.586E+00	6.109E+00	7.043E+00	7.929E+00	
24	1.200E-02	-3.015E+00	-1.491E+00	-1.870E+00	-1.883E+00	-4.367E-
01	8.823E-01	2.892E+00	4.797E+00	5.853E+00	6.842E+00	
23	1.100E-02	-4.140E+00	-3.054E+00	-4.682E+00	-5.319E+00	-2.443E+
00	-7.981E-01	1.442E+00	3.792E+00	4.905E+00	6.110E+00	
22	1.000E-02	-1.981E+00	-1.973E+00	-3.227E+00	-1.083E+01	-8.921E+
00	-3.442E+00	-1.181E-01	3.184E+00	4.449E+00	6.233E+00	
21	9.000E-03	-1.081E+00	-1.042E+00	-1.038E+00	-1.131E+00	-2.211E+
00	-4.338E+00	-5.175E+00	3.048E-01	2.433E+00	4.793E+00	
20	8.000E-03	-1.353E+00	-1.329E+00	-1.374E+00	-1.383E+00	-1.177E+
00	-1.039E+00	-5.703E-01	-1.158E-01	-4.062E+00	1.849E+00	
19	6.700E-03	-1.631E+00	-1.627E+00	-1.738E+00	-1.934E+00	-1.565E+
00	-6.547E-01	6.701E-01	1.376E+00	2.567E+00	4.109E+00	
18	5.500E-03	-1.364E+00	-1.354E+00	-1.457E+00	-1.601E+00	-1.232E+
00	-4.268E-01	8.768E-01	2.497E+00	4.238E+00	4.173E+00	
17	4.500E-03	-1.211E-01	-1.260E-01	-1.683E-01	-1.483E-01	2.740E-
01	1.116E+00	2.149E+00	3.231E+00	4.145E+00	4.977E+00	
16	3.700E-03	2.367E+00	2.476E+00	2.599E+00	3.200E+00	5.186E+
00	3.805E+00	3.968E+00	5.038E+00	5.685E+00	6.599E+00	
15	3.100E-03	2.979E+00	3.176E+00	3.395E+00	4.532E+00	6.723E+

00	9.823E+00	1.108E+01	7.814E+00	7.017E+00	8.530E+00		
14	2.600E-03	5.476E+00	5.785E+00	6.129E+00	7.871E+00	1.087E+	
01	1.499E+01	2.035E+01	1.293E+01	1.095E+01	1.150E+01		
13	2.200E-03	1.035E+01	1.077E+01	1.127E+01	1.363E+01	1.701E+	
01	2.085E+01	2.408E+01	2.407E+01	1.641E+01	1.432E+01		
12	1.900E-03	1.892E+01	1.935E+01	1.995E+01	2.254E+01	2.535E+	
01	2.800E+01	3.010E+01	3.239E+01	1.896E+01	1.863E+01		
11	1.700E-03	2.989E+01	3.010E+01	3.062E+01	3.206E+01	3.331E+	
01	3.392E+01	3.459E+01	3.507E+01	2.981E+01	2.294E+01		
10	1.500E-03	4.528E+01	4.479E+01	4.493E+01	4.355E+01	4.204E+	
01	4.012E+01	3.943E+01	3.974E+01	4.450E+01	2.469E+01		
9	1.400E-03	5.010E+01	4.955E+01	4.966E+01	4.775E+01	4.546E+	
01	4.294E+01	4.170E+01	4.204E+01	4.940E+01	2.610E+01		
8	1.200E-03	5.457E+01	5.408E+01	5.435E+01	5.274E+01	5.034E+	
01	4.752E+01	4.555E+01	4.596E+01	5.576E+01	2.985E+01		
7	1.000E-03	5.569E+01	5.532E+01	5.574E+01	5.466E+01	5.268E+	
01	5.018E+01	4.820E+01	4.819E+01	5.749E+01	3.547E+01		
6	8.000E-04	5.578E+01	5.541E+01	5.583E+01	5.502E+01	5.343E+	
01	5.129E+01	4.969E+01	4.822E+01	5.024E+01	4.716E+01		
5	6.000E-04	5.555E+01	5.517E+01	5.554E+01	5.478E+01	5.344E+	
01	5.161E+01	5.046E+01	4.864E+01	5.184E+01	5.570E+01		
4	4.000E-04	5.560E+01	5.513E+01	5.538E+01	5.454E+01	5.320E+	
01	5.148E+01	5.065E+01	4.889E+01	5.343E+01	5.959E+01		
3	2.000E-04	5.644E+01	5.581E+01	5.578E+01	5.457E+01	5.295E+	
01	5.095E+01	5.000E+01	4.815E+01	5.308E+01	6.121E+01		
2	1.000E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
0		X=	8.000E-02	9.500E-02	1.100E-01	1.250E-01	1.350E-
01	1.450E-01	1.550E-01	1.650E-01	1.750E-01			
0		K=	51	52	53	54	55
56	57	58	59				
I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00			
58	7.200E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00			
57	7.000E-02	1.770E+01	1.768E+01	1.767E+01	1.767E+01	1.767E+	
01	1.768E+01	1.768E+01	0.000E+00	0.000E+00			
56	6.800E-02	1.771E+01	1.769E+01	1.768E+01	1.768E+01	1.769E+	
01	1.769E+01	1.770E+01	0.000E+00	0.000E+00			
55	6.600E-02	1.770E+01	1.769E+01	1.768E+01	1.768E+01	1.769E+	
01	1.770E+01	1.771E+01	0.000E+00	0.000E+00			
54	6.400E-02	1.770E+01	1.768E+01	1.768E+01	1.768E+01	1.769E+	
01	1.770E+01	1.771E+01	0.000E+00	0.000E+00			
53	6.200E-02	1.769E+01	1.767E+01	1.767E+01	1.768E+01	1.769E+	
01	1.770E+01	1.771E+01	0.000E+00	0.000E+00			
52	6.000E-02	1.768E+01	1.766E+01	1.766E+01	1.767E+01	1.768E+	
01	1.769E+01	1.770E+01	0.000E+00	0.000E+00			
51	5.800E-02	1.767E+01	1.765E+01	1.765E+01	1.766E+01	1.767E+	
01	1.768E+01	1.769E+01	0.000E+00	0.000E+00			
50	5.600E-02	1.765E+01	1.764E+01	1.764E+01	1.764E+01	1.766E+	
01	1.767E+01	1.768E+01	0.000E+00	0.000E+00			
49	5.400E-02	1.763E+01	1.762E+01	1.762E+01	1.763E+01	1.764E+	
01	1.766E+01	1.767E+01	0.000E+00	0.000E+00			
48	5.200E-02	1.762E+01	1.760E+01	1.760E+01	1.762E+01	1.763E+	
01	1.764E+01	1.766E+01	0.000E+00	0.000E+00			
47	4.900E-02	1.758E+01	1.757E+01	1.758E+01	1.759E+01	1.761E+	
01	1.762E+01	1.763E+01	0.000E+00	0.000E+00			
46	4.600E-02	1.754E+01	1.753E+01	1.754E+01	1.756E+01	1.758E+	
01	1.759E+01	1.761E+01	0.000E+00	0.000E+00			
45	4.400E-02	1.751E+01	1.750E+01	1.751E+01	1.753E+01	1.755E+	
01	1.757E+01	1.759E+01	0.000E+00	0.000E+00			
44	4.200E-02	1.747E+01	1.747E+01	1.748E+01	1.750E+01	1.752E+	
01	1.754E+01	1.756E+01	0.000E+00	0.000E+00			

43	4.000E-02	1.743E+01	1.743E+01	1.745E+01	1.747E+01	1.749E+
01	1.751E+01	1.753E+01	0.000E+00	0.000E+00		
42	3.800E-02	1.738E+01	1.739E+01	1.741E+01	1.743E+01	1.746E+
01	1.748E+01	1.750E+01	0.000E+00	0.000E+00		
41	3.600E-02	1.733E+01	1.734E+01	1.736E+01	1.739E+01	1.741E+
01	1.744E+01	1.746E+01	0.000E+00	0.000E+00		
40	3.400E-02	1.727E+01	1.728E+01	1.731E+01	1.734E+01	1.737E+
01	1.740E+01	1.742E+01	0.000E+00	0.000E+00		
39	3.200E-02	1.720E+01	1.722E+01	1.725E+01	1.728E+01	1.731E+
01	1.735E+01	1.737E+01	0.000E+00	0.000E+00		
38	3.000E-02	1.712E+01	1.714E+01	1.719E+01	1.721E+01	1.725E+
01	1.729E+01	1.731E+01	0.000E+00	0.000E+00		
37	2.800E-02	1.703E+01	1.706E+01	1.711E+01	1.714E+01	1.718E+
01	1.722E+01	1.724E+01	0.000E+00	0.000E+00		
36	2.600E-02	1.692E+01	1.696E+01	1.702E+01	1.705E+01	1.709E+
01	1.714E+01	1.716E+01	0.000E+00	0.000E+00		
35	2.400E-02	1.680E+01	1.686E+01	1.693E+01	1.695E+01	1.699E+
01	1.703E+01	1.704E+01	0.000E+00	0.000E+00		
34	2.200E-02	1.667E+01	1.674E+01	1.679E+01	1.678E+01	1.679E+
01	1.682E+01	1.681E+01	0.000E+00	0.000E+00		
33	2.000E-02	1.638E+01	1.643E+01	1.641E+01	1.633E+01	1.632E+
01	1.632E+01	1.629E+01	0.000E+00	0.000E+00		
32	1.950E-02	1.620E+01	1.624E+01	1.621E+01	1.612E+01	1.611E+
01	1.612E+01	1.609E+01	0.000E+00	0.000E+00		
31	1.850E-02	1.561E+01	1.567E+01	1.564E+01	1.557E+01	1.558E+
01	1.560E+01	1.560E+01	0.000E+00	0.000E+00		
30	1.800E-02	1.521E+01	1.529E+01	1.529E+01	1.524E+01	1.528E+
01	1.531E+01	1.534E+01	0.000E+00	0.000E+00		
29	1.700E-02	1.419E+01	1.438E+01	1.447E+01	1.451E+01	1.461E+
01	1.470E+01	1.476E+01	0.000E+00	0.000E+00		
28	1.600E-02	1.299E+01	1.331E+01	1.356E+01	1.372E+01	1.388E+
01	1.413E+01	1.414E+01	0.000E+00	0.000E+00		
27	1.500E-02	1.161E+01	1.210E+01	1.264E+01	1.288E+01	1.297E+
01	1.399E+01	1.333E+01	0.000E+00	0.000E+00		
26	1.400E-02	9.910E+00	1.067E+01	1.199E+01	1.199E+01	1.155E+
01	1.217E+01	1.255E+01	0.000E+00	0.000E+00		
25	1.300E-02	8.586E+00	9.438E+00	1.053E+01	1.096E+01	1.148E+
01	1.200E+01	1.218E+01	0.000E+00	0.000E+00		
24	1.200E-02	7.652E+00	8.784E+00	1.012E+01	9.991E+00	1.060E+
01	1.357E+01	1.258E+01	0.000E+00	0.000E+00		
23	1.100E-02	6.632E+00	8.396E+00	1.121E+01	1.081E+01	1.137E+
01	1.216E+01	1.210E+01	0.000E+00	0.000E+00		
22	1.000E-02	8.042E+00	9.928E+00	1.071E+01	1.083E+01	1.126E+
01	1.161E+01	1.151E+01	0.000E+00	0.000E+00		
21	9.000E-03	6.850E+00	8.667E+00	9.793E+00	1.016E+01	1.061E+
01	1.089E+01	1.083E+01	0.000E+00	0.000E+00		
20	8.000E-03	4.746E+00	6.841E+00	8.164E+00	8.825E+00	9.433E+
00	9.970E+00	1.037E+01	0.000E+00	0.000E+00		
19	6.700E-03	2.947E+00	3.701E+00	5.165E+00	6.053E+00	6.541E+
00	7.898E+00	1.123E+01	0.000E+00	0.000E+00		
18	5.500E-03	4.182E+00	4.652E+00	5.506E+00	6.070E+00	6.155E+
00	6.146E+00	8.019E+00	0.000E+00	0.000E+00		
17	4.500E-03	5.767E+00	6.498E+00	7.254E+00	7.708E+00	7.965E+
00	8.283E+00	9.360E+00	0.000E+00	0.000E+00		
16	3.700E-03	7.600E+00	8.379E+00	9.160E+00	9.428E+00	9.603E+
00	9.769E+00	1.012E+01	0.000E+00	0.000E+00		
15	3.100E-03	9.714E+00	1.042E+01	1.084E+01	1.105E+01	1.103E+
01	1.101E+01	1.107E+01	0.000E+00	0.000E+00		
14	2.600E-03	1.238E+01	1.272E+01	1.266E+01	1.251E+01	1.241E+
01	1.218E+01	1.201E+01	0.000E+00	0.000E+00		
13	2.200E-03	1.499E+01	1.490E+01	1.434E+01	1.383E+01	1.351E+
01	1.320E+01	1.281E+01	0.000E+00	0.000E+00		
12	1.900E-03	1.751E+01	1.663E+01	1.565E+01	1.485E+01	1.435E+
01	1.398E+01	1.343E+01	0.000E+00	0.000E+00		
11	1.700E-03	1.778E+01	1.759E+01	1.650E+01	1.553E+01	1.492E+
01	1.445E+01	1.385E+01	0.000E+00	0.000E+00		

40	3.400E-02	0.000E+00	1.790E-05	1.497E-03	1.497E-03	1.497E-03
03	1.497E-03	1.497E-03	1.497E-03	1.497E-03	1.497E-03	1.497E-03
39	3.200E-02	0.000E+00	1.790E-05	1.497E-03	1.497E-03	1.496E-03
03	1.496E-03	1.496E-03	1.496E-03	1.496E-03	1.496E-03	1.496E-03
38	3.000E-02	0.000E+00	1.790E-05	1.496E-03	1.496E-03	1.496E-03
03	1.496E-03	1.496E-03	1.496E-03	1.495E-03	1.495E-03	1.495E-03
37	2.800E-02	0.000E+00	1.790E-05	1.495E-03	1.495E-03	1.495E-03
03	1.495E-03	1.495E-03	1.495E-03	1.495E-03	1.495E-03	1.495E-03
36	2.600E-02	0.000E+00	1.790E-05	1.495E-03	1.495E-03	1.494E-03
03	1.494E-03	1.494E-03	1.494E-03	1.494E-03	1.494E-03	1.494E-03
35	2.400E-02	0.000E+00	1.790E-05	1.494E-03	1.494E-03	1.494E-03
03	1.494E-03	1.494E-03	1.493E-03	1.493E-03	1.493E-03	1.493E-03
34	2.200E-02	0.000E+00	1.790E-05	1.493E-03	1.493E-03	1.493E-03
03	1.493E-03	1.493E-03	1.493E-03	1.493E-03	1.493E-03	1.493E-03
33	2.000E-02	0.000E+00	1.790E-05	1.491E-03	1.493E-03	1.495E-03
03	1.499E-03	1.503E-03	1.507E-03	1.512E-03	1.518E-03	1.495E-03
32	1.950E-02	0.000E+00	1.790E-05	1.576E-03	1.643E-03	1.698E-03
03	1.699E-03	1.699E-03	1.700E-03	1.700E-03	1.701E-03	1.698E-03
31	1.850E-02	0.000E+00	1.790E-05	1.710E-03	1.711E-03	1.712E-03
03	1.713E-03	1.714E-03	1.714E-03	1.715E-03	1.715E-03	1.712E-03
30	1.800E-02	0.000E+00	1.790E-05	1.706E-03	1.704E-03	1.704E-03
03	1.703E-03	1.703E-03	1.703E-03	1.697E-03	1.702E-03	1.704E-03
29	1.700E-02	0.000E+00	1.790E-05	1.697E-03	1.696E-03	1.696E-03
03	1.695E-03	1.695E-03	1.695E-03	1.695E-03	1.695E-03	1.696E-03
28	1.600E-02	0.000E+00	1.790E-05	1.691E-03	1.691E-03	1.691E-03
03	1.691E-03	1.691E-03	1.690E-03	1.690E-03	1.690E-03	1.691E-03
27	1.500E-02	0.000E+00	1.790E-05	1.689E-03	1.689E-03	1.689E-03
03	1.689E-03	1.689E-03	1.689E-03	1.689E-03	1.689E-03	1.689E-03
26	1.400E-02	0.000E+00	1.790E-05	1.689E-03	1.689E-03	1.689E-03
03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.689E-03
25	1.300E-02	0.000E+00	1.790E-05	1.689E-03	1.688E-03	1.688E-03
03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.688E-03
24	1.200E-02	0.000E+00	1.790E-05	1.688E-03	1.688E-03	1.688E-03
03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.688E-03	1.688E-03
23	1.100E-02	0.000E+00	1.790E-05	1.687E-03	1.687E-03	1.687E-03
03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03
22	1.000E-02	0.000E+00	1.790E-05	1.687E-03	1.687E-03	1.687E-03
03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03
21	9.000E-03	0.000E+00	1.790E-05	1.620E-03	1.621E-03	1.620E-03
03	1.619E-03	1.619E-03	1.620E-03	1.622E-03	1.625E-03	1.620E-03
20	8.000E-03	0.000E+00	1.790E-05	1.523E-03	1.527E-03	1.529E-03
03	1.531E-03	1.533E-03	1.535E-03	1.537E-03	1.540E-03	1.529E-03
19	6.700E-03	0.000E+00	1.790E-05	1.526E-03	1.528E-03	1.529E-03
03	1.528E-03	1.526E-03	1.525E-03	1.524E-03	1.523E-03	1.529E-03
18	5.500E-03	0.000E+00	1.790E-05	1.609E-03	1.607E-03	1.604E-03
03	1.601E-03	1.597E-03	1.592E-03	1.588E-03	1.584E-03	1.604E-03
17	4.500E-03	0.000E+00	1.790E-05	1.552E-03	1.551E-03	1.550E-03
03	1.549E-03	1.548E-03	1.546E-03	8.806E-04	8.797E-04	1.550E-03
16	3.700E-03	0.000E+00	1.790E-05	8.675E-04	8.665E-04	8.655E-03
04	8.644E-04	8.633E-04	8.622E-04	8.611E-04	8.602E-04	8.655E-03
15	3.100E-03	0.000E+00	1.790E-05	8.528E-04	8.519E-04	8.511E-03
04	8.504E-04	8.498E-04	8.492E-04	8.487E-04	8.482E-04	8.511E-03
14	2.600E-03	0.000E+00	1.790E-05	8.466E-04	8.463E-04	8.462E-03
04	8.461E-04	8.461E-04	8.462E-04	8.463E-04	8.464E-04	8.462E-03
13	2.200E-03	0.000E+00	1.790E-05	8.493E-04	8.504E-04	8.513E-03
04	8.521E-04	8.529E-04	8.535E-04	8.542E-04	8.547E-04	8.513E-03
12	1.900E-03	0.000E+00	1.790E-05	8.699E-04	8.704E-04	8.707E-03
04	8.709E-04	8.711E-04	8.713E-04	8.715E-04	8.717E-04	8.707E-03
11	1.700E-03	0.000E+00	1.790E-05	9.056E-04	9.001E-04	8.965E-03
04	8.942E-04	8.927E-04	8.916E-04	8.908E-04	8.902E-04	8.965E-03
10	1.500E-03	0.000E+00	1.790E-05	9.175E-04	9.161E-04	9.147E-03
04	9.133E-04	9.119E-04	9.107E-04	9.096E-04	9.086E-04	9.147E-03
9	1.400E-03	0.000E+00	1.790E-05	9.173E-04	9.170E-04	9.165E-03
04	9.160E-04	9.153E-04	9.146E-04	9.139E-04	9.132E-04	9.165E-03
8	1.200E-03	0.000E+00	1.790E-05	9.174E-04	9.173E-04	9.171E-03
04	9.170E-04	9.168E-04	9.166E-04	9.164E-04	9.162E-04	9.171E-03

7	1.000E-03	0.000E+00	1.790E-05	9.172E-04	9.171E-04	9.170E-	
04	9.169E-04	9.168E-04	9.167E-04	9.166E-04	9.165E-04		
6	8.000E-04	0.000E+00	1.790E-05	9.170E-04	9.169E-04	9.168E-	
04	9.167E-04	9.166E-04	9.165E-04	9.165E-04	9.164E-04		
5	6.000E-04	0.000E+00	1.790E-05	9.167E-04	9.166E-04	9.165E-	
04	9.164E-04	9.164E-04	9.163E-04	9.162E-04	9.162E-04		
4	4.000E-04	0.000E+00	1.790E-05	9.164E-04	9.163E-04	9.162E-	
04	9.162E-04	9.161E-04	9.161E-04	9.160E-04	9.160E-04		
3	2.000E-04	0.000E+00	1.790E-05	9.160E-04	9.159E-04	9.158E-	
04	9.158E-04	9.157E-04	9.157E-04	9.157E-04	9.157E-04		
2	1.000E-04	0.000E+00	1.790E-05	9.153E-04	9.153E-04	9.153E-	
04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04		
1	0.000E+00	0.000E+00	1.790E-05	9.153E-04	9.153E-04	9.153E-	
04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04		
0		X=	1.000E-03	1.100E-03	1.200E-03	1.300E-03	1.400E-
03	1.500E-03	1.600E-03	1.700E-03	1.800E-03	1.900E-03		
0		K=	11	12	13	14	15
16		17	18	19	20		
I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+	
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
58	7.200E-02	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-	
05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-05		
57	7.000E-02	1.506E-03	1.506E-03	1.506E-03	1.506E-03	1.505E-	
03	1.505E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-03		
56	6.800E-02	1.505E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-	
03	1.505E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-03		
55	6.600E-02	1.505E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-	
03	1.504E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-03		
54	6.400E-02	1.504E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-	
03	1.504E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-03		
53	6.200E-02	1.504E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-	
03	1.504E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-03		
52	6.000E-02	1.504E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-	
03	1.503E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-03		
51	5.800E-02	1.503E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-	
03	1.503E-03	1.503E-03	1.502E-03	1.502E-03	1.502E-03		
50	5.600E-02	1.503E-03	1.502E-03	1.502E-03	1.502E-03	1.502E-	
03	1.502E-03	1.502E-03	1.502E-03	1.502E-03	1.502E-03		
49	5.400E-02	1.502E-03	1.502E-03	1.502E-03	1.502E-03	1.502E-	
03	1.502E-03	1.502E-03	1.501E-03	1.501E-03	1.501E-03		
48	5.200E-02	1.505E-03	1.505E-03	1.504E-03	1.504E-03	1.504E-	
03	1.504E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-03		
47	4.900E-02	1.507E-03	1.506E-03	1.506E-03	1.506E-03	1.506E-	
03	1.506E-03	1.506E-03	1.506E-03	1.506E-03	1.506E-03		
46	4.600E-02	1.503E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-	
03	1.503E-03	1.502E-03	1.502E-03	1.502E-03	1.502E-03		
45	4.400E-02	1.499E-03	1.499E-03	1.499E-03	1.499E-03	1.499E-	
03	1.499E-03	1.499E-03	1.499E-03	1.499E-03	1.499E-03		
44	4.200E-02	1.499E-03	1.499E-03	1.499E-03	1.499E-03	1.499E-	
03	1.498E-03	1.498E-03	1.498E-03	1.498E-03	1.498E-03		
43	4.000E-02	1.498E-03	1.498E-03	1.498E-03	1.498E-03	1.498E-	
03	1.498E-03	1.498E-03	1.498E-03	1.498E-03	1.498E-03		
42	3.800E-02	1.498E-03	1.498E-03	1.498E-03	1.498E-03	1.497E-	
03	1.497E-03	1.497E-03	1.497E-03	1.497E-03	1.497E-03		
41	3.600E-02	1.497E-03	1.497E-03	1.497E-03	1.497E-03	1.497E-	
03	1.497E-03	1.497E-03	1.497E-03	1.496E-03	1.496E-03		
40	3.400E-02	1.497E-03	1.496E-03	1.496E-03	1.496E-03	1.496E-	
03	1.496E-03	1.496E-03	1.496E-03	1.496E-03	1.496E-03		
39	3.200E-02	1.496E-03	1.496E-03	1.496E-03	1.496E-03	1.496E-	
03	1.495E-03	1.495E-03	1.495E-03	1.495E-03	1.495E-03		
38	3.000E-02	1.495E-03	1.495E-03	1.495E-03	1.495E-03	1.495E-	
03	1.495E-03	1.495E-03	1.495E-03	1.495E-03	1.495E-03		
37	2.800E-02	1.495E-03	1.495E-03	1.494E-03	1.494E-03	1.494E-	
03	1.494E-03	1.494E-03	1.494E-03	1.494E-03	1.494E-03		
36	2.600E-02	1.494E-03	1.494E-03	1.494E-03	1.494E-03	1.494E-	

31	1.850E-02	1.719E-03	1.725E-03	1.724E-03	1.724E-03	1.723E-
03	1.731E-03	1.738E-03	1.737E-03	1.734E-03	1.731E-03	
30	1.800E-02	1.705E-03	1.721E-03	1.433E-03	1.726E-03	1.724E-
03	1.729E-03	1.734E-03	1.735E-03	1.737E-03	1.737E-03	
29	1.700E-02	1.702E-03	1.706E-03	1.706E-03	1.417E-03	1.704E-
03	1.402E-03	1.700E-03	1.381E-03	1.422E-03	1.421E-03	
28	1.600E-02	1.694E-03	1.696E-03	1.697E-03	1.698E-03	1.700E-
03	1.703E-03	1.704E-03	1.431E-03	1.710E-03	1.408E-03	
27	1.500E-02	1.691E-03	1.692E-03	1.693E-03	1.693E-03	1.694E-
03	1.696E-03	1.698E-03	1.700E-03	1.700E-03	1.435E-03	
26	1.400E-02	1.689E-03	1.690E-03	1.691E-03	1.692E-03	1.692E-
03	1.694E-03	1.696E-03	1.697E-03	1.699E-03	1.699E-03	
25	1.300E-02	1.689E-03	1.690E-03	1.691E-03	1.692E-03	1.692E-
03	1.694E-03	1.696E-03	1.697E-03	1.699E-03	1.701E-03	
24	1.200E-02	1.689E-03	1.690E-03	1.691E-03	1.692E-03	1.692E-
03	1.694E-03	1.696E-03	1.697E-03	1.699E-03	1.701E-03	
23	1.100E-02	1.689E-03	1.690E-03	1.691E-03	1.691E-03	1.691E-
03	1.693E-03	1.694E-03	1.695E-03	1.696E-03	1.698E-03	
22	1.000E-02	1.688E-03	1.689E-03	1.689E-03	1.690E-03	1.690E-
03	1.691E-03	1.692E-03	1.693E-03	1.693E-03	1.694E-03	
21	9.000E-03	1.634E-03	1.596E-03	1.623E-03	1.650E-03	1.676E-
03	1.654E-03	1.654E-03	1.690E-03	1.691E-03	1.691E-03	
20	8.000E-03	1.532E-03	1.491E-03	1.513E-03	1.535E-03	1.557E-
03	1.531E-03	1.524E-03	1.556E-03	1.589E-03	1.623E-03	
19	6.700E-03	1.480E-03	1.436E-03	1.450E-03	1.466E-03	1.482E-
03	1.452E-03	1.439E-03	1.462E-03	1.486E-03	1.512E-03	
18	5.500E-03	1.522E-03	1.483E-03	1.491E-03	1.501E-03	1.510E-
03	1.484E-03	1.470E-03	1.486E-03	1.502E-03	1.518E-03	
17	4.500E-03	8.729E-04	8.723E-04	8.716E-04	8.711E-04	8.707E-
04	8.704E-04	8.706E-04	8.700E-04	8.709E-04	8.701E-04	
16	3.700E-03	8.538E-04	8.533E-04	8.530E-04	8.525E-04	8.533E-
04	8.520E-04	8.537E-04	8.516E-04	8.547E-04	8.514E-04	
15	3.100E-03	8.464E-04	8.465E-04	8.465E-04	8.465E-04	8.465E-
04	8.467E-04	8.469E-04	8.469E-04	8.470E-04	8.470E-04	
14	2.600E-03	8.485E-04	8.491E-04	8.494E-04	8.497E-04	8.499E-
04	8.504E-04	8.510E-04	8.513E-04	8.515E-04	8.516E-04	
13	2.200E-03	8.588E-04	8.597E-04	8.601E-04	8.604E-04	8.607E-
04	8.614E-04	8.622E-04	8.625E-04	8.626E-04	8.627E-04	
12	1.900E-03	8.739E-04	8.748E-04	8.751E-04	8.752E-04	8.752E-
04	8.759E-04	8.767E-04	8.768E-04	8.767E-04	8.765E-04	
11	1.700E-03	8.882E-04	8.891E-04	8.890E-04	8.888E-04	8.885E-
04	8.891E-04	8.898E-04	8.895E-04	8.890E-04	8.885E-04	
10	1.500E-03	9.020E-04	9.021E-04	9.016E-04	9.010E-04	9.003E-
04	9.003E-04	9.003E-04	8.996E-04	8.988E-04	8.980E-04	
9	1.400E-03	9.067E-04	9.064E-04	9.057E-04	9.050E-04	9.044E-
04	9.040E-04	9.036E-04	9.029E-04	9.021E-04	9.013E-04	
8	1.200E-03	9.131E-04	9.128E-04	9.123E-04	9.117E-04	9.112E-
04	9.108E-04	9.103E-04	9.096E-04	9.089E-04	9.081E-04	
7	1.000E-03	9.154E-04	9.152E-04	9.149E-04	9.146E-04	9.143E-
04	9.140E-04	9.137E-04	9.132E-04	9.127E-04	9.122E-04	
6	8.000E-04	9.159E-04	9.159E-04	9.158E-04	9.156E-04	9.155E-
04	9.154E-04	9.152E-04	9.149E-04	9.146E-04	9.143E-04	
5	6.000E-04	9.159E-04	9.160E-04	9.159E-04	9.158E-04	9.158E-
04	9.157E-04	9.157E-04	9.155E-04	9.154E-04	9.152E-04	
4	4.000E-04	9.158E-04	9.158E-04	9.158E-04	9.158E-04	9.157E-
04	9.157E-04	9.157E-04	9.157E-04	9.156E-04	9.155E-04	
3	2.000E-04	9.156E-04	9.156E-04	9.156E-04	9.156E-04	9.156E-
04	9.156E-04	9.156E-04	9.155E-04	9.155E-04	9.154E-04	
2	1.000E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-
04	9.153E-04	9.153E-04	9.152E-04	9.152E-04	9.152E-04	
1	0.000E+00	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-
04	9.153E-04	9.153E-04	9.152E-04	9.152E-04	9.152E-04	
0	X=	4.500E-03	4.800E-03	5.200E-03	5.600E-03	6.000E-
03	6.500E-03	7.000E-03	7.500E-03	8.000E-03	8.500E-03	
0	K=	31	32	33	34	35
36		37	38	39	40	

04	9.156E-04	9.156E-04	9.155E-04	9.155E-04	9.155E-04	
2	1.000E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-
04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	
1	0.000E+00	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-
04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	9.153E-04	
0		X=	2.000E-03	2.200E-03	2.400E-03	2.600E-03
03	3.000E-03	3.300E-03	3.600E-03	3.900E-03	4.200E-03	2.800E-
0		K=	21	22	23	24
26		27	28	29	30	25
I	Y					
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
58	7.200E-02	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-
05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	
57	7.000E-02	1.511E-03	1.517E-03	1.517E-03	1.516E-03	1.516E-
03	1.521E-03	1.525E-03	1.525E-03	1.524E-03	1.524E-03	
56	6.800E-02	1.511E-03	1.516E-03	1.516E-03	1.516E-03	1.516E-
03	1.520E-03	1.524E-03	1.524E-03	1.523E-03	1.523E-03	
55	6.600E-02	1.510E-03	1.515E-03	1.515E-03	1.515E-03	1.515E-
03	1.519E-03	1.523E-03	1.523E-03	1.523E-03	1.522E-03	
54	6.400E-02	1.510E-03	1.515E-03	1.515E-03	1.514E-03	1.514E-
03	1.519E-03	1.522E-03	1.522E-03	1.522E-03	1.522E-03	
53	6.200E-02	1.509E-03	1.514E-03	1.514E-03	1.514E-03	1.514E-
03	1.518E-03	1.522E-03	1.521E-03	1.521E-03	1.521E-03	
52	6.000E-02	1.509E-03	1.513E-03	1.513E-03	1.513E-03	1.513E-
03	1.517E-03	1.521E-03	1.521E-03	1.520E-03	1.520E-03	
51	5.800E-02	1.508E-03	1.513E-03	1.513E-03	1.512E-03	1.512E-
03	1.516E-03	1.520E-03	1.520E-03	1.519E-03	1.519E-03	
50	5.600E-02	1.507E-03	1.512E-03	1.512E-03	1.512E-03	1.512E-
03	1.516E-03	1.519E-03	1.519E-03	1.519E-03	1.518E-03	
49	5.400E-02	1.507E-03	1.511E-03	1.511E-03	1.511E-03	1.511E-
03	1.515E-03	1.518E-03	1.518E-03	1.518E-03	1.518E-03	
48	5.200E-02	1.510E-03	1.515E-03	1.515E-03	1.515E-03	1.514E-
03	1.519E-03	1.523E-03	1.522E-03	1.522E-03	1.522E-03	
47	4.900E-02	1.512E-03	1.518E-03	1.518E-03	1.517E-03	1.517E-
03	1.522E-03	1.526E-03	1.526E-03	1.525E-03	1.525E-03	
46	4.600E-02	1.508E-03	1.513E-03	1.513E-03	1.512E-03	1.512E-
03	1.516E-03	1.520E-03	1.520E-03	1.519E-03	1.519E-03	
45	4.400E-02	1.504E-03	1.508E-03	1.508E-03	1.507E-03	1.507E-
03	1.511E-03	1.514E-03	1.514E-03	1.513E-03	1.513E-03	
44	4.200E-02	1.503E-03	1.507E-03	1.507E-03	1.507E-03	1.506E-
03	1.510E-03	1.513E-03	1.513E-03	1.512E-03	1.512E-03	
43	4.000E-02	1.502E-03	1.506E-03	1.506E-03	1.506E-03	1.506E-
03	1.509E-03	1.512E-03	1.512E-03	1.511E-03	1.511E-03	
42	3.800E-02	1.502E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-
03	1.508E-03	1.511E-03	1.511E-03	1.510E-03	1.510E-03	
41	3.600E-02	1.501E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-
03	1.507E-03	1.510E-03	1.510E-03	1.509E-03	1.509E-03	
40	3.400E-02	1.500E-03	1.504E-03	1.503E-03	1.503E-03	1.503E-
03	1.506E-03	1.509E-03	1.509E-03	1.508E-03	1.508E-03	
39	3.200E-02	1.499E-03	1.503E-03	1.503E-03	1.502E-03	1.502E-
03	1.505E-03	1.508E-03	1.507E-03	1.507E-03	1.507E-03	
38	3.000E-02	1.499E-03	1.502E-03	1.502E-03	1.502E-03	1.501E-
03	1.504E-03	1.507E-03	1.506E-03	1.506E-03	1.506E-03	
37	2.800E-02	1.498E-03	1.501E-03	1.501E-03	1.501E-03	1.500E-
03	1.503E-03	1.505E-03	1.505E-03	1.505E-03	1.505E-03	
36	2.600E-02	1.497E-03	1.500E-03	1.500E-03	1.500E-03	1.499E-
03	1.502E-03	1.504E-03	1.504E-03	1.504E-03	1.504E-03	
35	2.400E-02	1.496E-03	1.499E-03	1.499E-03	1.499E-03	1.498E-
03	1.501E-03	1.503E-03	1.503E-03	1.503E-03	1.503E-03	
34	2.200E-02	1.497E-03	1.500E-03	1.500E-03	1.500E-03	1.501E-
03	1.504E-03	1.507E-03	1.507E-03	1.508E-03	1.509E-03	
33	2.000E-02	1.600E-03	1.619E-03	1.635E-03	1.651E-03	1.668E-
03	1.690E-03	1.713E-03	1.714E-03	1.715E-03	1.716E-03	
32	1.950E-02	1.707E-03	1.712E-03	1.713E-03	1.714E-03	1.714E-
03	1.719E-03	1.724E-03	1.725E-03	1.726E-03	1.726E-03	

I	Y						
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
58	7.200E-02	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-
05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-
57	7.000E-02	1.524E-03	1.528E-03	1.531E-03	1.531E-03	1.531E-03	1.534E-
03	1.536E-03	1.536E-03	1.536E-03	1.536E-03	1.536E-03	1.536E-03	1.536E-
56	6.800E-02	1.523E-03	1.526E-03	1.530E-03	1.529E-03	1.529E-03	1.532E-
03	1.535E-03	1.535E-03	1.534E-03	1.534E-03	1.533E-03	1.533E-03	1.533E-
55	6.600E-02	1.522E-03	1.526E-03	1.529E-03	1.528E-03	1.528E-03	1.531E-
03	1.534E-03	1.533E-03	1.533E-03	1.533E-03	1.532E-03	1.532E-03	1.532E-
54	6.400E-02	1.521E-03	1.525E-03	1.528E-03	1.528E-03	1.528E-03	1.530E-
03	1.533E-03	1.533E-03	1.532E-03	1.532E-03	1.531E-03	1.531E-03	1.531E-
53	6.200E-02	1.521E-03	1.524E-03	1.527E-03	1.527E-03	1.527E-03	1.529E-
03	1.532E-03	1.531E-03	1.531E-03	1.531E-03	1.530E-03	1.530E-03	1.530E-
52	6.000E-02	1.520E-03	1.523E-03	1.526E-03	1.526E-03	1.526E-03	1.528E-
03	1.531E-03	1.530E-03	1.530E-03	1.530E-03	1.529E-03	1.529E-03	1.529E-
51	5.800E-02	1.519E-03	1.522E-03	1.525E-03	1.525E-03	1.525E-03	1.527E-
03	1.530E-03	1.529E-03	1.529E-03	1.529E-03	1.528E-03	1.528E-03	1.528E-
50	5.600E-02	1.518E-03	1.521E-03	1.524E-03	1.524E-03	1.524E-03	1.526E-
03	1.529E-03	1.528E-03	1.528E-03	1.528E-03	1.527E-03	1.527E-03	1.527E-
49	5.400E-02	1.517E-03	1.520E-03	1.523E-03	1.523E-03	1.523E-03	1.525E-
03	1.528E-03	1.527E-03	1.527E-03	1.527E-03	1.526E-03	1.526E-03	1.526E-
48	5.200E-02	1.522E-03	1.525E-03	1.528E-03	1.528E-03	1.528E-03	1.531E-
03	1.533E-03	1.533E-03	1.532E-03	1.532E-03	1.532E-03	1.532E-03	1.532E-
47	4.900E-02	1.525E-03	1.529E-03	1.532E-03	1.532E-03	1.532E-03	1.535E-
03	1.537E-03	1.537E-03	1.537E-03	1.536E-03	1.536E-03	1.536E-03	1.536E-
46	4.600E-02	1.519E-03	1.522E-03	1.525E-03	1.525E-03	1.525E-03	1.527E-
03	1.530E-03	1.529E-03	1.529E-03	1.529E-03	1.528E-03	1.528E-03	1.528E-
45	4.400E-02	1.513E-03	1.516E-03	1.518E-03	1.518E-03	1.518E-03	1.520E-
03	1.522E-03	1.522E-03	1.521E-03	1.521E-03	1.521E-03	1.521E-03	1.521E-
44	4.200E-02	1.512E-03	1.515E-03	1.517E-03	1.517E-03	1.517E-03	1.519E-
03	1.521E-03	1.520E-03	1.520E-03	1.520E-03	1.519E-03	1.519E-03	1.519E-
43	4.000E-02	1.511E-03	1.514E-03	1.516E-03	1.516E-03	1.516E-03	1.518E-
03	1.519E-03	1.519E-03	1.519E-03	1.519E-03	1.518E-03	1.518E-03	1.518E-
42	3.800E-02	1.510E-03	1.512E-03	1.515E-03	1.514E-03	1.514E-03	1.516E-
03	1.518E-03	1.518E-03	1.518E-03	1.517E-03	1.517E-03	1.517E-03	1.517E-
41	3.600E-02	1.509E-03	1.511E-03	1.513E-03	1.513E-03	1.513E-03	1.515E-
03	1.517E-03	1.517E-03	1.516E-03	1.516E-03	1.516E-03	1.516E-03	1.516E-
40	3.400E-02	1.508E-03	1.510E-03	1.512E-03	1.512E-03	1.512E-03	1.514E-
03	1.516E-03	1.515E-03	1.515E-03	1.515E-03	1.514E-03	1.514E-03	1.514E-
39	3.200E-02	1.507E-03	1.509E-03	1.511E-03	1.511E-03	1.511E-03	1.513E-
03	1.514E-03	1.514E-03	1.514E-03	1.513E-03	1.513E-03	1.513E-03	1.513E-
38	3.000E-02	1.506E-03	1.508E-03	1.510E-03	1.510E-03	1.510E-03	1.511E-
03	1.513E-03	1.512E-03	1.512E-03	1.512E-03	1.512E-03	1.512E-03	1.512E-
37	2.800E-02	1.505E-03	1.507E-03	1.508E-03	1.508E-03	1.508E-03	1.510E-
03	1.511E-03	1.511E-03	1.511E-03	1.510E-03	1.510E-03	1.510E-03	1.510E-
36	2.600E-02	1.503E-03	1.505E-03	1.507E-03	1.507E-03	1.507E-03	1.508E-
03	1.510E-03	1.510E-03	1.509E-03	1.509E-03	1.509E-03	1.509E-03	1.509E-
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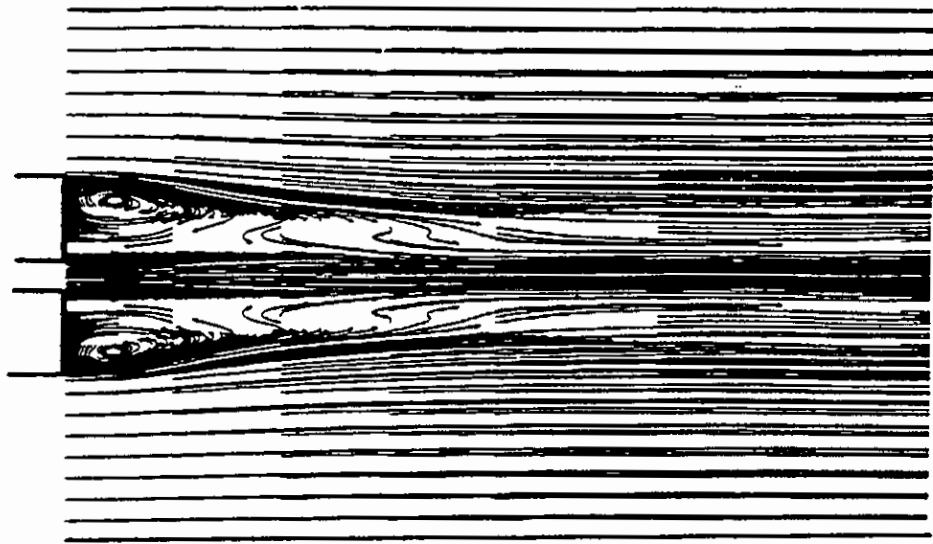
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25	1.300E-02	1.704E-03	1.698E-03	1.418E-03	1.697E-03	1.390E-
03	1.690E-03	1.439E-03	1.594E-03	1.513E-03	1.547E-03	
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23	1.100E-02	1.699E-03	1.702E-03	1.705E-03	1.707E-03	1.711E-
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03	1.707E-03	1.709E-03	1.713E-03	1.718E-03	1.725E-03	
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03	1.699E-03	1.701E-03	1.704E-03	1.708E-03	1.713E-03	
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02	3.000E-02	4.000E-02	5.500E-02	6.000E-02	7.500E-02	
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46	47	48	49	50		
I	Y					
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
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03	2.233E-03	2.745E-03	2.795E-03	2.931E-03	3.027E-03	
56	6.800E-02	1.533E-03	1.533E-03	1.608E-03	1.654E-03	1.720E-
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03	1.688E-03	1.708E-03	1.678E-03	1.674E-03	1.669E-03	
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03	1.631E-03	1.645E-03	1.624E-03	1.621E-03	1.617E-03	
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4	4.000E-04	9.121E-04	9.115E-04	9.098E-04	9.049E-04	8.944E-
04	8.779E-04	8.616E-04	8.548E-04	8.602E-04	8.802E-04	
3	2.000E-04	9.128E-04	9.123E-04	9.099E-04	9.039E-04	8.922E-
04	8.750E-04	8.580E-04	8.506E-04	8.549E-04	8.735E-04	
2	1.000E-04	9.127E-04	9.122E-04	9.089E-04	9.014E-04	8.884E-
04	8.703E-04	8.526E-04	8.454E-04	8.492E-04	8.670E-04	
1	0.000E+00	9.127E-04	9.122E-04	9.089E-04	9.014E-04	8.884E-
04	8.703E-04	8.526E-04	8.454E-04	8.492E-04	8.670E-04	
0	X=	8.000E-02	9.500E-02	1.100E-01	1.250E-01	1.350E-
01	1.450E-01	1.550E-01	1.650E-01	1.750E-01		
0	K=	51	52	53	54	55
56	57	58	59			
I	Y					
59	7.600E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+
00	0.000E+00	0.000E+00	0.000E+00	0.000E+00		
58	7.200E-02	1.790E-05	1.790E-05	1.790E-05	1.790E-05	1.790E-
05	1.790E-05	1.790E-05	1.790E-05	0.000E+00		
57	7.000E-02	3.096E-03	3.732E-03	3.926E-03	3.739E-03	3.445E-
03	3.397E-03	3.360E-03	1.602E-03	0.000E+00		
56	6.800E-02	2.484E-03	2.912E-03	3.073E-03	2.981E-03	2.806E-
03	2.785E-03	2.765E-03	1.564E-03	0.000E+00		
55	6.600E-02	2.090E-03	2.370E-03	2.496E-03	2.462E-03	2.368E-
03	2.369E-03	2.365E-03	1.538E-03	0.000E+00		
54	6.400E-02	1.854E-03	2.030E-03	2.119E-03	2.112E-03	2.065E-
03	2.077E-03	2.085E-03	1.520E-03	0.000E+00		
53	6.200E-02	1.735E-03	1.838E-03	1.890E-03	1.889E-03	1.864E-
03	1.879E-03	1.891E-03	1.507E-03	0.000E+00		
52	6.000E-02	1.686E-03	1.748E-03	1.770E-03	1.762E-03	1.743E-
03	1.754E-03	1.764E-03	1.498E-03	0.000E+00		
51	5.800E-02	1.669E-03	1.713E-03	1.718E-03	1.701E-03	1.681E-

03	1.686E-03	1.691E-03	1.492E-03	0.000E+00		
50	5.600E-02	1.662E-03	1.700E-03	1.697E-03	1.677E-03	1.655E-
03	1.655E-03	1.656E-03	1.490E-03	0.000E+00		
49	5.400E-02	1.658E-03	1.694E-03	1.689E-03	1.667E-03	1.645E-
03	1.643E-03	1.641E-03	1.488E-03	0.000E+00		
48	5.200E-02	1.677E-03	1.716E-03	1.710E-03	1.685E-03	1.660E-
03	1.656E-03	1.653E-03	1.489E-03	0.000E+00		
47	4.900E-02	1.693E-03	1.735E-03	1.728E-03	1.700E-03	1.673E-
03	1.669E-03	1.665E-03	1.490E-03	0.000E+00		
46	4.600E-02	1.665E-03	1.701E-03	1.695E-03	1.671E-03	1.647E-
03	1.643E-03	1.640E-03	1.488E-03	0.000E+00		
45	4.400E-02	1.637E-03	1.668E-03	1.663E-03	1.643E-03	1.622E-
03	1.619E-03	1.616E-03	1.486E-03	0.000E+00		
44	4.200E-02	1.631E-03	1.661E-03	1.656E-03	1.637E-03	1.617E-
03	1.613E-03	1.611E-03	1.486E-03	0.000E+00		
43	4.000E-02	1.626E-03	1.655E-03	1.650E-03	1.631E-03	1.612E-
03	1.609E-03	1.606E-03	1.486E-03	0.000E+00		
42	3.800E-02	1.622E-03	1.650E-03	1.645E-03	1.627E-03	1.608E-
03	1.605E-03	1.602E-03	1.485E-03	0.000E+00		
41	3.600E-02	1.618E-03	1.645E-03	1.640E-03	1.622E-03	1.604E-
03	1.602E-03	1.599E-03	1.486E-03	0.000E+00		
40	3.400E-02	1.614E-03	1.640E-03	1.636E-03	1.619E-03	1.602E-
03	1.600E-03	1.598E-03	1.487E-03	0.000E+00		
39	3.200E-02	1.610E-03	1.637E-03	1.634E-03	1.618E-03	1.602E-
03	1.602E-03	1.601E-03	1.493E-03	0.000E+00		
38	3.000E-02	1.608E-03	1.636E-03	1.637E-03	1.625E-03	1.611E-
03	1.613E-03	1.616E-03	1.507E-03	0.000E+00		
37	2.800E-02	1.611E-03	1.646E-03	1.654E-03	1.649E-03	1.640E-
03	1.648E-03	1.655E-03	1.540E-03	0.000E+00		
36	2.600E-02	1.632E-03	1.684E-03	1.708E-03	1.713E-03	1.710E-
03	1.726E-03	1.739E-03	1.609E-03	0.000E+00		
35	2.400E-02	1.709E-03	1.790E-03	1.831E-03	1.843E-03	1.844E-
03	1.865E-03	1.878E-03	1.698E-03	0.000E+00		
34	2.200E-02	1.889E-03	1.992E-03	1.998E-03	1.970E-03	1.934E-
03	1.926E-03	1.916E-03	1.701E-03	0.000E+00		
33	2.000E-02	1.950E-03	2.008E-03	2.002E-03	1.961E-03	1.915E-
03	1.899E-03	1.884E-03	1.698E-03	0.000E+00		
32	1.950E-02	1.907E-03	1.954E-03	1.944E-03	1.907E-03	1.867E-
03	1.852E-03	1.839E-03	1.695E-03	0.000E+00		
31	1.850E-02	1.944E-03	1.994E-03	1.974E-03	1.924E-03	1.875E-
03	1.855E-03	1.840E-03	1.695E-03	0.000E+00		
30	1.800E-02	1.961E-03	2.010E-03	1.983E-03	1.927E-03	1.874E-
03	1.853E-03	1.838E-03	1.694E-03	0.000E+00		
29	1.700E-02	2.033E-03	2.086E-03	2.040E-03	1.967E-03	1.899E-
03	1.871E-03	1.857E-03	1.695E-03	0.000E+00		
28	1.600E-02	2.032E-03	2.072E-03	2.016E-03	1.946E-03	1.879E-
03	1.851E-03	1.841E-03	1.694E-03	0.000E+00		
27	1.500E-02	2.007E-03	2.026E-03	1.969E-03	1.910E-03	1.854E-
03	1.828E-03	1.888E-03	1.695E-03	0.000E+00		
26	1.400E-02	1.946E-03	1.958E-03	1.912E-03	1.991E-03	1.923E-
03	1.890E-03	1.847E-03	1.694E-03	0.000E+00		
25	1.300E-02	2.011E-03	2.041E-03	2.015E-03	1.933E-03	1.872E-
03	1.855E-03	1.821E-03	1.693E-03	0.000E+00		
24	1.200E-02	1.929E-03	1.950E-03	1.940E-03	1.883E-03	1.742E-
03	1.738E-03	1.730E-03	1.688E-03	0.000E+00		
23	1.100E-02	1.882E-03	1.770E-03	1.765E-03	1.747E-03	1.734E-
03	1.730E-03	1.723E-03	1.687E-03	0.000E+00		
22	1.000E-02	1.744E-03	1.761E-03	1.754E-03	1.738E-03	1.713E-
03	1.684E-03	1.679E-03	1.675E-03	0.000E+00		
21	9.000E-03	1.727E-03	1.681E-03	1.647E-03	1.620E-03	1.595E-
03	1.575E-03	1.579E-03	1.582E-03	0.000E+00		
20	8.000E-03	1.570E-03	1.541E-03	1.514E-03	1.495E-03	1.476E-
03	1.459E-03	1.474E-03	1.494E-03	0.000E+00		
19	6.700E-03	1.448E-03	1.477E-03	1.473E-03	1.459E-03	1.450E-
03	1.444E-03	1.425E-03	1.381E-03	0.000E+00		
18	5.500E-03	1.881E-03	1.950E-03	1.919E-03	1.872E-03	1.831E-

5. ДИАГНОСТИКА ПОЖАРА



6. ΒΙΒΛΙΟΓΡΑΦΙΑ

Υπολογιστική Μεταφορά θερμότητας και Ρευστομηχανική
Κωνσταντίνος Π. Μαυρίδης

