Tables of Weyl Fractional Integrals
for the Airy Function

By N. L. Balazs*, H. C. Pauli and O. B. Dabbousi

Abstract. Functions related to the Weyl fractional integral of the Airy function are tabulated for the 16 lowest orders and for a range of parameters of practical interest. This range, coupled with the asymptotic relations given, covers the entire real axis.

The *objects of interest* are the numerical values and the asymptotic properties of the functions V and W, defined by

$$(1) \qquad V(z; n, v; m, \mu) = \int_z^\infty dt(t - z)^{n-1} W(t, v) W^m(t, \mu),$$

$$(2) \qquad W(z, n) = \int_z^\infty dt(t - z)^n \operatorname{Ai}(t)$$

(with $\operatorname{Ai}(x)$ being the Airy function). They were recently needed to study the properties of atomic nuclei and were not available in the literature. Since they are useful in this context, and might be of mathematical interest, we present them here.

In the following we discuss briefly the functions and their asymptotic properties. The numerical tables are given in the microfiche section of this issue.

Each function, V and W, is proportional to a Weyl *fractional integral* [2]. The Weyl fractional integral of an arbitrary function $f(t)$ is defined by

$$(3) \qquad h(z, \mu) = \mathfrak{A}\{f(t), z\} = 1/\Gamma(\mu) \int_z^\infty dt(t - z)^{\mu-1} f(t),$$

and has the following simple properties for differentiation and integration,

$$(4) \qquad dh(z, \mu)/dz = - h(z, \mu - 1), \qquad \int_z^\infty dt\, h(t, \mu) = h(z, \mu + 1).$$

If the function $f(t)$ itself is a fractional integral, the above transformation acts as a step operator, i.e.

$$(5) \qquad \frac{1}{\Gamma(v)} \int_z^\infty dt(t - z)^{v-1} h(t, \mu) = h(z, \mu + v).$$

The definitions (1) and (2) are convenient for physical reasons. The differential and integral relations corresponding to (4) and (5) read then

(6) $dW(z, n)/dz = -nW(z, n - 1)$, $\int_z^\infty dt\, W(t, n) = W(z, n + 1)/(n + 1)$,

(7) $\int_z^\infty dt\,(t - z)^n W(t, m) = B(n + 1, m + 1) W(z, n + m + 1)$,

and, correspondingly, for V. The beta function $B(z, w)$ is defined as usual [1]

(8) $$B(z, w) = \Gamma(z)\Gamma(w)/\Gamma(z + w).$$

The integral, Eq. (7), is very similar to the function V; in particular, $V(z; n, \nu; 0, \mu) = B(n, \nu + 1) W(z, n + \nu)$. Therefore, we introduce another function $Z(z, n, \nu, m, \mu)$, i.e.

(9) $V(z; n, \nu; m, \mu) = B(n, \nu + m\mu + 1)\, W(z, n + \nu) \cdot W^m(z, \mu) \cdot Z(z; n, \nu; m, \mu)$;

and as a shorthand notation

(10) $X(z, n) = Z(z; n, 3/2; 1, 3/2)$ and $Y(z, n) = Z(z; n, 3/2; 2, 3/2)$.

As we shall see below, the functions X and Y, are of the order of magnitude unity.

  The *asymptotic behavior* of these functions may be obtained by studying their complex integral representation, which is based on the well-known representation of the Airy function

(11) $$\text{Ai}(z) = \frac{1}{2\pi i} \int_C dt\, e^{-zt + t^3/3}.$$

The contour C is shown in Figure 1. Inserting this into Eq. (1), inverting the order of ntegration, and making use of the definition of the Γ-function, one finds

12a) $$W(z, n) = \frac{\Gamma(n + 1)}{2\pi i} \int_C \frac{dt}{t^{n+1}}\, e^{-zt + t^3/3}.$$
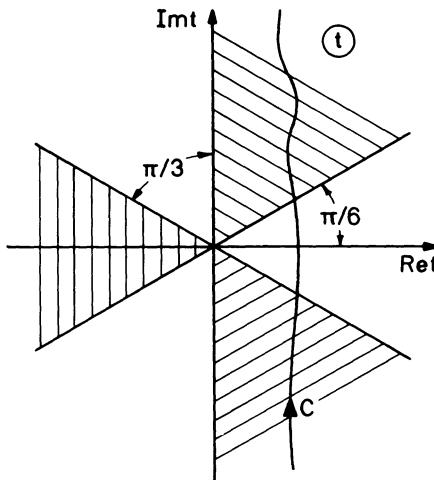

FIGURE 1

The contour C for the integral representation of the Airy function.
*In the shaded areas* Re $t^3 < 0$. *The contour must end in the indicated triangles.*
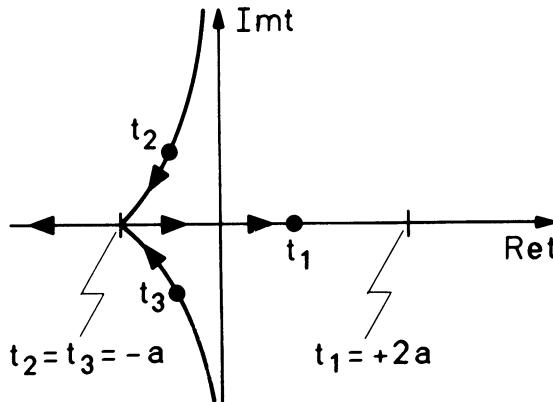
FIGURE 2

The migration of the three saddle points t_1, t_2 and t_3 for values of
$z \sim -\infty$ *to* $z \sim +\infty$ $(\longrightarrow)$.

Similarly, we find, for example,

$$Z(z; n, \nu; 2, \mu) = \Gamma(n) \frac{\Gamma(\nu + 1)}{2\pi i} \cdot \frac{\Gamma(\mu + 1)}{2\pi i}$$

(12b)

$$\cdot \int_C \frac{dt}{t^{\nu+1}} e^{-zt+t^3/3} \int_C \frac{ds}{s^{\mu+1}} \frac{e^{-zs+s^3/3}}{(s + t)^n} .$$

In order to study the function $W(z, n)$, we investigated the pole and saddle point struc-
ture of the integrand.

The integrand has a pole of order $(n + 1)$ at the origin $t = 0$. The saddle points are
given by the zero of the function $d\varphi/dz$, where

(13) $\varphi(n, t; z) = -zt + t^3/3 - (n + 1)\ln t.$

Thus, the saddle points are given by the roots of the cubic

(14) $-zt + t^3 - (n + 1) = 0.$

Let $n \geqslant 0$, z real. Then the three roots t_1, t_2, t_3 as functions of z are given as follows.
t_1 is *always* real and positive. t_2, t_3 have *always* negative real parts. For $z > z_c = 3((n + 1)/2)^{2/3}$ all roots are real.

(a) For $z \ll 0$ the complex roots are near the imaginary axis:

(15a) $t_1 \simeq (n + 1)/|z| - (n + 1)^3/|z|^4 + \cdots ,$

(15b) $\text{Re } t_2 = \text{Re } t_3 = -(n + 1)/(2|z|)(1 - (n + 1)^2/|z|^3 + \cdots),$

(15c) $\text{Im } t_2 = -\text{Im } t_3 = +|z|^{1/2}(1 + 3/8(n + 1)^2/|z|^3 + \cdots).$

b) For $z = z_c$: $t_2 = t_3 = -t_1/2$, $t_1 = 2(z_c/3)^{1/2}.$

(c) For $z \gg z_c$:

(16a) $$t_1 = -t_3 = z^{1/2} + (n + 1)/(2z) + O(z^{-3/2}),$$

(16b) $$t_2 = -(n + 1)/z - (n + 1)^3/z^4 + \cdots.$$

The integral can be evaluated asymptotically in z using the saddle point approximation. For *large positive* z all contributions come from t_1, and we obtain

(17) $$W(z, n) = \frac{\Gamma(n + 1)\, e^{-2z^{3/2}/3}}{2\pi^{1/2} \quad z^{(2n+3)/4}} [1 + O(1/z)].$$
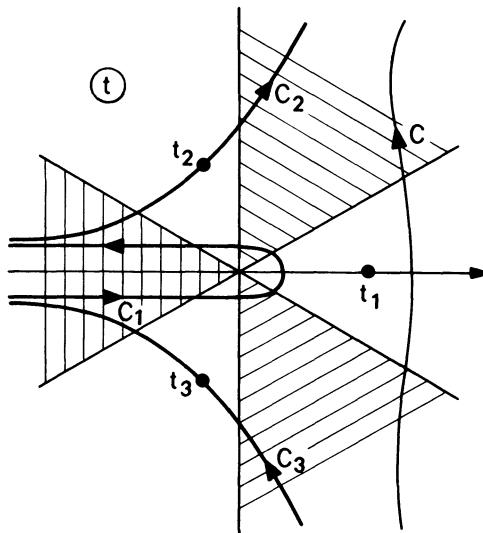
FIGURE 3

The definition of the contours C_1, C_2 and C_3.

For *large and negative* z the simple saddle point approximation should be applied only to the contributions from the saddle points at t_2 and t_3, since in the limit $z \to -\infty$ the saddle point t_1 pinches the singularity at the origin. Therefore, we deform first the contour in a way indicated in Figure 3 and evaluate separately the contributions from contour C_1 and from contours C_2 and C_3. For z, large and negative, we rewrite the integral over C_1 as

$$\frac{1}{2\pi i} \int_{C_1} \frac{dt}{t^{n+1}} e^{+|z|t + t^3/3}$$

$$= |z|^n \frac{1}{2\pi i} \int_{C_1} \frac{du}{u^{n+1}} e^{u + u^3/(3|z|^3)}$$

(18)

$$\sim |z|^n \frac{1}{2\pi i} \int_{C_1} \frac{du}{u^{n+1}} e^u (1 + u^3/(3|z|^3) + \cdots)$$

$$\sim |z|^n / \Gamma(n + 1) \{1 + \Gamma(n + 1)/(3|z|^3 \Gamma(n + 1 - 3)) + \cdots\}.$$

Here, we use the variable substitution $|z|t = u$ and Hankel's definition of the inverse Γ function [1],

$$\frac{1}{2\pi i} \int_{C_1} \frac{du}{u^n} e^u = 1/\Gamma(n).$$

The contributions from the contours C_2 and C_3 are again evaluated by the saddle point approximation. We finally get

(19)
$$W(z, n) = |z|^n \{1 + \Gamma(n + 1)/(\Gamma(n - 2)3|z|^3) + O(|z|^{-6})\}$$

$$+\frac{\Gamma(n + 1)}{\pi^{\frac{1}{2}}|z|^{(2n+3)/4}} \sin(2|z|^{3/2}/3 - (2n + 1)\pi/4)[1 + O(|z|^{-1})].$$

The last relation makes it immediately clear that for large and negative values of z the asymptotic behavior of the Z function is given by

(20)
$$Z(z; n, v; m, \mu) \longrightarrow 1 \quad \text{for } z \ll 0.$$

No simple relation was found for large positive values of z.

The functions $W(z, n)$ are *tabulated* in Tables 1 and 2 for half integer and integer values of n, respectively. In Table 3 the functions $X(z, n)$ and $Y(z, n)$ are given for three integer values of n. The range of z has been so chosen that the tabulated values should overlap with those obtained by asymptotic expansions. Figure 4 shows the first sixteen functions.
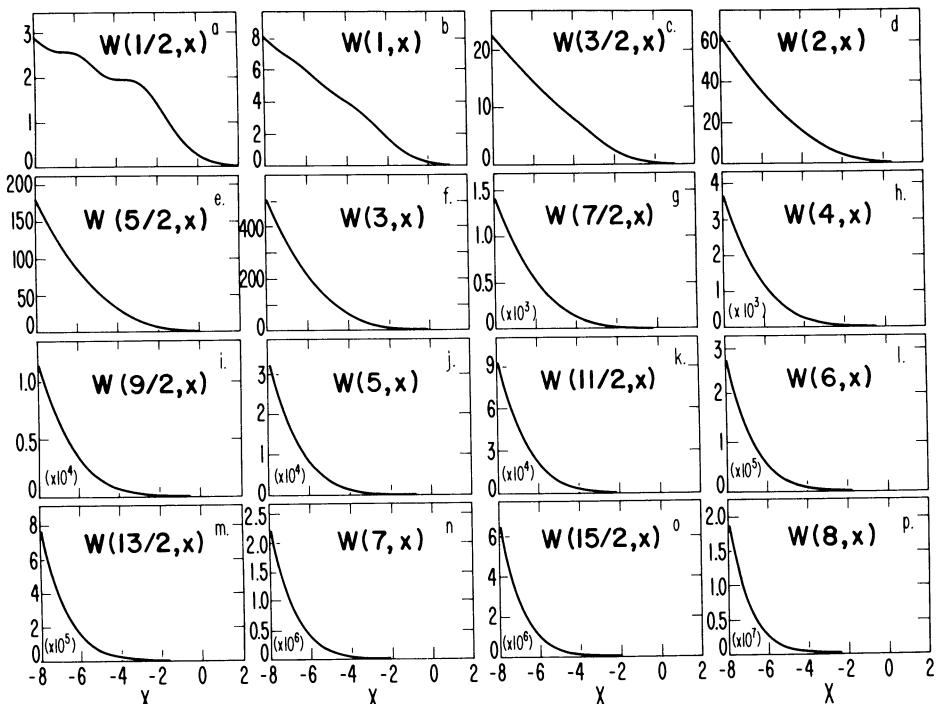
FIGURE 4

The first sixteen $W(n, x)$ functions

The functions have been evaluated by numerical integration of Eqs. (1) and (2). Standard numerical methods were applied, i.e. Gaussian quadratures based on Jacobi- and Legendre-polynomials. The computer codes were tested to yield correct results up to eight digits if the Airy function was replaced by t^n or by e^{-t}. The Airy function was taken from tables [1] and interpolated or asymptotic expansions [1] were used. By checking the code with Eq. (6) an accuracy of at least 5 digits was established.

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2. A. ERDÉLYI, (Editor), *Tables of Integral Transforms*, Vol. 2, McGraw-Hill, New York, 1954, p. 201.
3. N. L. BALAZS & H. C. PAULI, *Z. Physik A*, v. 281, 1977, p. 395.

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TABLE 1
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z	W(z, 1/2)	W(z, 3/2)	W(z, 5/2)	W(z, 7/2)	W(z, 9/2)	W(z,11/2)	W(z,13/2)	W(z,15/2)
-10.0	0.31922E+01	0.31801E+02	0.31643E+03	0.31763E+04	0.32639E+05	0.32537E+06	0.33323E+07	0.34468E+08
-9.9	0.31619E+01	1.31124E+02	0.30859E+03	0.30669E+04	0.30634E+05	0.30813E+06	0.31264E+07	0.32647E+08
-9.8	0.31300E+01	1.30653E+02	0.30687E+03	0.29607E+04	0.29278E+05	0.29168E+06	0.29313E+07	0.29979E+08
-9.7	0.30901E+01	1.30106E+02	0.29327E+03	0.28563E+04	0.27970E+05	0.27592E+06	0.27471E+07	0.27647E+08
-9.6	0.30677E+01	1.29723E+02	0.28578E+03	0.27540E+04	0.26707E+05	0.26089E+06	0.25727E+07	0.25652E+08
-9.5	0.30402E+01	1.29265E+02	0.27840E+03	0.26562E+04	0.25498E+05	0.24653E+06	0.24078E+07	0.23785E+08
-9.4	0.30195E+01	1.28811E+02	0.27114E+03	0.25608E+04	0.24316E+05	0.23284E+06	0.22551E+07	0.22639E+08
-9.3	0.29972E+01	1.28350E+02	0.26402E+03	0.24664E+04	0.23185E+05	0.21978E+06	0.21051E+07	0.20465E+08
-9.2	0.29626E+01	1.27911E+02	0.25696E+03	0.23752E+04	0.22096E+05	0.20733E+06	0.19602E+07	0.18879E+08
-9.1	0.29729E+01	1.27405E+02	0.25064E+03	0.22865E+04	0.21047E+05	0.19547E+06	0.18335E+07	0.17454E+08
-9.0	0.29673E+01	1.27110E+02	0.24373E+03	0.22009E+04	0.20030E+05	0.18417E+06	0.17120E+07	0.16124E+08
-8.9	0.29697E+01	1.26575E+02	0.23653E+03	0.21160E+04	0.19067E+05	0.17342E+06	0.15956E+07	0.14894E+08
-8.8	0.29648E+01	1.26130E+02	0.22994E+03	0.20346E+04	0.18133E+05	0.16319E+06	0.14864E+07	0.13729E+08
-8.7	0.29637E+01	1.25685E+02	0.22347E+03	0.19559E+04	0.17235E+05	0.15347E+06	0.13835E+07	0.12653E+08
-8.6	0.29626E+01	1.25241E+02	0.21710E+03	0.18789E+04	0.16373E+05	0.14423E+06	0.12867E+07	0.11652E+08
-8.5	0.29591E+01	1.24797E+02	0.21085E+03	0.18033E+04	0.15545E+05	0.13545E+06	0.11959E+07	0.10721E+08
-8.4	0.29528E+01	1.24351E+02	0.20470E+03	0.17305E+04	0.14750E+05	0.12712E+06	0.11106E+07	0.99565E+07
-8.3	0.29406E+01	1.23911E+02	0.19867E+03	0.16599E+04	0.13987E+05	0.11922E+06	0.10306E+07	0.92539E+07
-8.2	0.29242E+01	1.23472E+02	0.19275E+03	0.15915E+04	0.13255E+05	0.11173E+06	0.95555E+06	0.83694E+07
-8.1	0.29029E+01	1.23235E+02	0.18693E+03	0.15252E+04	0.12554E+05	0.10463E+06	0.88526E+06	0.76194E+07
-8.0	0.28768E+01	1.22601E+02	0.18123E+03	0.14606E+04	0.11882E+05	0.97913E+05	0.81945E+06	0.69824E+07
-7.9	0.28466E+01	1.22172E+02	0.17563E+03	0.13982E+04	0.11239E+05	0.91556E+05	0.75789E+06	0.63873E+07
-7.8	0.28192E+01	1.21747E+02	0.17014E+03	0.13377E+04	0.10624E+05	0.85549E+05	0.70035E+06	0.58425E+07
-7.7	0.27779E+01	1.21328E+02	0.16476E+03	0.12794E+04	0.10035E+05	0.79865E+05	0.64661E+06	0.53377E+07
-7.6	0.27420E+01	1.20914E+02	0.15948E+03	0.12227E+04	0.94724E+04	0.74581E+05	0.59646E+06	0.48717E+07
-7.5	0.27088E+01	1.20505E+02	0.15430E+03	0.11674E+04	0.89340E+04	0.69440E+05	0.54969E+06	0.44421E+07
-7.4	0.26737E+01	1.20102E+02	0.14923E+03	0.11143E+04	0.84215E+04	0.64669E+05	0.50612E+06	0.40446E+07
-7.3	0.26430E+01	1.19703E+02	0.14425E+03	0.10629E+04	0.79317E+04	0.60173E+05	0.46557E+06	0.36822E+07
-7.2	0.26176E+01	1.19308E+02	0.13937E+03	0.10133E+04	0.74644E+04	0.55940E+05	0.42784E+06	0.33473E+07
-7.1	0.25901E+01	1.18917E+02	0.13460E+03	0.96533E+03	0.70194E+04	0.51957E+05	0.39279E+06	0.30397E+07
-7.0	0.25798E+01	1.18529E+02	0.12992E+03	0.91967E+03	0.65955E+04	0.48214E+05	0.36023E+06	0.27575E+07
-6.9	0.25676E+01	1.18143E+02	0.12523E+03	0.87441E+03	0.61921E+04	0.44699E+05	0.33004E+06	0.24988E+07
-6.8	0.25599E+01	1.17596E+02	0.12084E+03	0.83132E+03	0.58083E+04	0.41400E+05	0.30209E+06	0.22619E+07
-6.7	0.25536E+01	1.17375E+02	0.11645E+03	0.78986E+03	0.54436E+04	0.38306E+05	0.27623E+06	0.20451E+07
-6.6	0.25545E+01	2.16992E+02	0.11216E+03	0.74983E+03	0.50973E+04	0.35408E+05	0.25225E+06	0.18471E+07
-6.5	0.25537E+01	1.16509E+02	0.10796E+03	0.71124E+03	0.47686E+04	0.32694E+05	0.23013E+06	0.16663E+07
-6.4	0.25534E+01	1.16226E+02	0.10385E+03	0.67422E+03	0.44569E+04	0.30168E+05	0.20971E+06	0.15015E+07
-6.3	0.25928E+01	1.15843E+02	0.99862E+02	0.63857E+03	0.41610E+04	0.27798E+05	0.19088E+06	0.13513E+07
-6.2	0.25603E+01	1.15460E+02	0.95936E+02	0.60431E+03	0.38820E+04	0.25579E+05	0.17355E+06	0.12148E+07
-6.1	0.25113E+01	1.15170E+02	0.92113E+02	0.57141E+03	0.36175E+04	0.23517E+05	0.15760E+06	0.10907E+07
-6.0	0.25380E+01	1.14198E+02	0.88391E+02	0.53982E+03	0.33675E+04	0.21597E+05	0.14294E+06	0.97824E+06
-5.9	0.25149E+01	1.14320E+02	0.84763E+02	0.50952E+03	0.31314E+04	0.19811E+05	0.12940E+06	0.87595E+06
-5.8	0.24628E+01	1.13944E+02	0.81231E+02	0.48848E+03	0.29088E+04	0.18159E+05	0.11716E+06	0.78553E+06
-5.7	0.24496E+01	1.13572E+02	0.77792E+02	0.45265E+03	0.26989E+04	0.16609E+05	0.10585E+06	0.69098E+06
-5.6	0.24395E+01	1.13204E+02	0.74444E+02	0.42801E+03	0.25012E+04	0.15179E+05	0.95544E+05	0.62448E+06
-5.5	0.24081E+01	1.12542E+02	0.71188E+02	0.40453E+03	0.23153E+04	0.13855E+05	0.86116E+05	0.55641E+06
-5.4	0.23611E+01	1.12489E+02	0.68023E+02	0.37617E+03	0.21408E+04	0.12630E+05	0.77513E+05	0.49510E+06
-5.3	0.23195E+01	0.12134E+02	0.64946E+02	0.35929E+03	0.19766E+04	0.11498E+05	0.69674E+05	0.43895E+06
-5.2	0.22763E+01	1.11789E+02	0.61956E+02	0.33676E+03	0.18226E+04	0.10454E+05	0.62548E+05	0.39240E+06
-5.1	0.22336E+01	1.11451E+02	0.59056E+02	0.32002E+03	0.16780E+04	0.94917E+04	0.56808E+05	0.34590E+06
-5.0	0.21896E+01	0.11119E+02	0.56238E+02	0.29035E+03	0.15444E+04	0.86898E+04	0.50191E+05	0.30619E+06

TABLE 1   (CONTINUED)

Z	W(Z, 1/2)	W(Z, 3/2)	W(Z, 5/2)	W(Z, 7/2)	W(Z, 9/2)	W(Z,11/2)	W(Z,13/2)	W(Z,15/2)
-5.0	0.21096E+01	0.11119E+02	0.56230E+02	0.28935E+03	0.15448E+04	0.86058E+04	0.50191E+05	0.30615E+06
-4.9	0.21402E+01	0.11794E+02	0.53491E+02	0.27616E+03	0.14182E+04	0.77916E+04	0.44845E+05	0.27054E+06
-4.8	0.21695E+01	0.10474E+02	0.50832E+02	0.25190E+03	0.13008E+04	0.70443E+04	0.40047E+05	0.23873E+06
-4.7	0.20743E+01	0.10161E+02	0.48753E+02	0.23456E+03	0.11913E+04	0.63593E+04	0.35694E+05	0.21035E+06
-4.6	0.20437E+01	0.98519E+01	0.45752E+02	0.21811E+03	0.10895E+04	0.57324E+04	0.31767E+05	0.18508E+06
-4.5	0.20106E+01	0.95476E+01	0.43327E+02	0.20253E+03	0.99491E+03	0.51595E+04	0.28230E+05	0.16250E+06
-4.4	0.19667E+01	0.92467E+01	0.40978E+02	0.18778E+03	0.90712E+03	0.46367E+04	0.25049E+05	0.14265E+06
-4.3	0.19774E+01	0.89408E+01	0.38703E+02	0.17383E+03	0.82579E+03	0.41605E+04	0.22192E+05	0.12475E+06
-4.2	0.19647E+01	0.86533E+01	0.36503E+02	0.16068E+03	0.75055E+03	0.37273E+04	0.19631E+05	0.11028E+06
-4.1	0.19990E+01	0.83593E+01	0.34377E+02	0.14828E+03	0.68107E+03	0.33338E+04	0.17338E+05	0.95436E+05
-4.0	0.19564E+01	0.80603E+01	0.32323E+02	0.13666E+03	0.61780E+03	0.29771E+04	0.15269E+05	0.83215E+05
-3.9	0.19477E+01	0.77733E+01	0.30343E+02	0.12564E+03	0.55802E+03	0.26542E+04	0.13401E+05	0.72447E+05
-3.8	0.19407E+01	0.74819E+01	0.28436E+02	0.11536E+03	0.50382E+03	0.23624E+04	0.11832E+05	0.62974E+05
-3.7	0.19446E+01	0.71702E+01	0.26622E+02	0.10573E+03	0.45418E+03	0.20992E+04	0.10384E+05	0.54653E+05
-3.6	0.19483E+01	0.69700E+01	0.24841E+02	0.96726E+02	0.40857E+03	0.18621E+04	0.90976E+02	0.47358E+05
-3.5	0.19449E+01	0.66001E+01	0.23153E+02	0.88329E+02	0.36695E+03	0.16490E+04	0.70577E+04	0.40711E+05
-3.4	0.19410E+01	0.63145E+01	0.21530E+02	0.80510E+02	0.32809E+03	0.14570E+04	0.69491E+04	0.35388E+05
-3.3	0.19354E+01	0.60238E+01	0.19996E+02	0.73244E+02	0.29441E+03	0.12865E+04	0.60582E+04	0.30577E+05
-3.2	0.19296E+01	0.57341E+01	0.18526E+02	0.66505E+02	0.26299E+03	0.11334E+04	0.52727E+04	0.26275E+05
-3.1	0.19155E+01	0.54403E+01	0.17120E+02	0.60287E+02	0.23448E+03	0.99668E+03	0.45813E+04	0.22535E+05
-3.0	0.18927E+01	0.51509E+01	0.15803E+02	0.54906E+02	0.20808E+03	0.87493E+03	0.39733E+04	0.19382E+05
-2.9	0.18607E+01	0.48705E+01	0.14548E+02	0.49197E+02	0.18536E+03	0.76668E+03	0.34410E+04	0.16635E+05
-2.8	0.18393E+01	0.46016E+01	0.13363E+02	0.44314E+02	0.16434E+03	0.67061E+03	0.29745E+04	0.14245E+05
-2.7	0.18044E+01	0.43272E+01	0.12247E+02	0.39635E+02	0.14542E+03	0.58552E+03	0.25669E+04	0.12129E+05
-2.6	0.17642E+01	0.40595E+01	0.11199E+02	0.35733E+02	0.12843E+03	0.51030E+03	0.22112E+04	0.10334E+05
-2.5	0.17160E+01	0.38782E+01	0.10217E+02	0.31908E+02	0.11320E+03	0.44393E+03	0.19015E+04	0.89630E+04
-2.4	0.16691E+01	0.35442E+01	0.92973E+01	0.28574E+02	0.99590E+02	0.38540E+03	0.16324E+04	0.74780E+04
-2.3	0.16130E+01	0.33298E+01	0.84442E+01	0.25471E+02	0.87441E+02	0.33411E+03	0.13989E+04	0.63414E+04
-2.2	0.15508E+01	0.30505E+01	0.76456E+01	0.22656E+02	0.76623E+02	0.28905E+03	0.11967E+04	0.53712E+04
-2.1	0.14910E+01	0.28521E+01	0.69120E+01	0.20109E+02	0.67010E+02	0.24981E+03	0.10217E+04	0.45415E+04
-2.0	0.14292E+01	0.26135E+01	0.62328E+01	0.17810E+02	0.58487E+02	0.21514E+03	0.87188E+03	0.38311E+04
-1.9	0.13571E+01	0.24146E+01	0.56057E+01	0.15740E+02	0.50947E+02	0.18509E+03	0.74123E+03	0.32297E+04
-1.8	0.12872E+01	0.22363E+01	0.50296E+01	0.13884E+02	0.44290E+02	0.15894E+03	0.62962E+03	0.27167E+04
-1.7	0.12162E+01	0.20186E+01	0.45017E+01	0.12221E+02	0.38425E+02	0.13623E+03	0.53367E+03	0.22813E+04
-1.6	0.11497E+01	0.18415E+01	0.40194E+01	0.10732E+02	0.33271E+02	0.11654E+03	0.45187E+03	0.19124E+04
-1.5	0.10733E+01	0.16751E+01	0.35800E+01	0.93951E+01	0.28750E+02	0.99511E+02	0.38179E+03	0.16005E+04
-1.4	0.10206E+01	0.15194E+01	0.31910E+01	0.82135E+01	0.24793E+02	0.84811E+02	0.32201E+03	0.13372E+04
-1.3	0.93301E+00	0.13743E+01	0.28195E+01	0.71641E+01	0.21338E+02	0.72146E+02	0.27110E+03	0.11153E+04
-1.2	0.86502E+00	0.12319E+01	0.24929E+01	0.62351E+01	0.18328E+02	0.61257E+02	0.22783E+03	0.92861E+03
-1.1	0.79004E+00	0.11147E+01	0.21900E+01	0.54152E+01	0.15710E+02	0.51914E+02	0.19113E+03	0.77188E+03
-1.0	0.73542E+00	0.99963E+00	0.19348E+01	0.46902E+01	0.13439E+02	0.43912E+02	0.16005E+03	0.64351E+03
-0.9	0.67443E+00	0.89393E+00	0.16983E+01	0.40574E+01	0.11474E+02	0.37074E+02	0.13379E+03	0.53503E+03
-0.8	0.61632E+00	0.79710E+00	0.14871E+01	0.35080E+01	0.57758E+01	0.31242E+02	0.11164E+03	0.43882E+03
-0.7	0.56123E+00	0.70888E+00	0.12990E+01	0.30139E+01	0.83125E+01	0.26278E+02	0.92989E+02	0.36226E+03
-0.6	0.50931E+00	0.62863E+00	0.11320E+01	0.25891E+01	0.70540E+01	0.22061E+02	0.77317E+02	0.29857E+03
-0.5	0.46601E+00	0.55593E+00	0.98408E+00	0.22193E+01	0.59740E+01	0.18486E+02	0.64171E+02	0.24566E+03
-0.4	0.41567E+00	0.49209E+00	0.85342E+00	0.18982E+01	0.50493E+01	0.15461E+02	0.53164E+02	0.20178E+03
-0.3	0.37986E+00	0.43132E+00	0.73836E+00	0.16201E+01	0.42592E+01	0.12927E+02	0.43970E+02	0.16534E+03
-0.2	0.33959E+00	0.37824E+00	0.63731E+00	0.13797E+01	0.35855E+01	0.10755E+02	0.36305E+02	0.13544E+03
-0.1	0.29804E+00	0.33088E+00	0.54878E+00	0.11725E+01	0.30124E+01	0.89445E+01	0.29915E+02	0.11069E+03
0.0	0.26515E+00	0.28868E+00	0.47144E+00	0.99438E+00	0.25259E+01	0.74251E+01	0.24609E+02	0.90301E+02

TABLE 1   (CONTINUED)

Z	W(Z, 1/2)	W(Z, 3/2)	W(Z, 5/2)	W(Z, 7/2)	W(Z, 9/2)	W(Z,11/2)	W(Z,13/2)	W(Z,15/2)
0.0	0.26515E+00	0.28865E+00	0.47144E+00	0.99430E+00	0.25259E-01	0.74251E+01	0.24609E+02	0.90301E+02
0.1	0.23514E+00	0.25119E+00	0.40405E+00	0.84134E+00	0.21138E+01	0.61524E+01	0.20208E+02	0.73640E+02
0.2	0.20748E+00	0.21803E+00	0.34548E+00	0.71344E+00	0.17654E+01	0.50883E+01	0.16566E+02	0.59799E+02
0.3	0.18321E+00	0.18870E+00	0.29473E+00	0.59862E+00	0.14715E+01	0.42085E+01	0.13556E+02	0.48540E+02
0.4	0.16198E+00	0.16291E+00	0.25084E+00	0.50333E+00	0.12241E+01	0.34611E+01	0.11673E+02	0.39334E+02
0.5	0.14102E+00	0.14529E+00	0.21321E+00	0.42233E+00	0.10164E+01	0.28467E+01	0.90291E+01	0.31821E+02
0.6	0.12317E+00	0.12556E+00	0.18046E+00	0.35361E+00	0.84221E+00	0.23378E+01	0.73496E+01	0.25699E+02
0.7	0.10726E+00	0.10324E+00	0.15255E+00	0.29546E+00	0.69654E+00	0.19159E+01	0.59721E+01	0.20721E+02
0.8	0.93142E-01	0.80232E-01	0.12865E+00	0.24634E+00	0.57494E+00	0.15664E+01	0.48443E+01	0.16670E+02
0.9	0.80648E-01	0.75217E-01	0.10826E+00	0.20490E+00	0.47360E+00	0.12788E+01	0.36226E+01	0.13413E+02
1.0	0.69632E-01	0.63964E-01	0.90899E-01	0.17022E+00	0.38940E+00	0.16422E+01	0.31780E+01	0.11752E+02
1.1	0.59933E-01	0.54261E-01	0.76191E-01	0.14100E+00	0.21962E+00	0.84780E+00	0.25504E+01	0.86119E+01
1.2	0.51477E-01	0.45919E-01	0.63695E-01	0.11605E+00	0.26150E+00	0.68841E+00	0.20611E+01	0.69650E+01
1.3	0.44079E-01	0.38764E-01	0.53093E-01	0.96274E-01	0.21403E+00	0.55798E+00	0.16574E+01	0.54969E+01
1.4	0.37642E-01	0.32646E-01	0.44187E-01	0.79294E-01	0.17464E+00	0.45145E+00	0.13305E+01	0.43830E+01
1.5	0.32039E-01	0.27429E-01	0.36695E-01	0.65174E-01	0.14223E+00	0.36465E+00	0.10663E+01	0.34855E+01
1.6	0.27237E-01	0.22991E-01	0.30426E-01	0.53447E-01	0.11562E+00	0.29303E+00	0.85302E+00	0.27657E+01
1.7	0.23171E-01	0.19226E-01	0.25144E-01	0.43771E-01	0.93812E-01	0.23654E+00	0.68127E+00	0.21956E+01
1.8	0.19406E-01	0.16045E-01	0.20747E-01	0.35764E-01	0.75974E-01	0.19011E+00	0.54317E+00	0.17353E+01
1.9	0.16432E-01	0.13352E-01	0.17082E-01	0.29165E-01	0.61412E-01	0.15237E+00	0.43233E+00	0.13741E+01
2.0	0.13815E-01	0.11198E-01	0.14036E-01	0.23735E-01	0.49550E-01	0.12190E+00	0.34351E+00	0.11843E+01
2.1	0.11900E-01	0.91075E-02	0.11508E-01	0.19279E-01	0.39905E-01	0.97454E-01	0.27255E+00	0.85433E+00
2.2	0.96919E-02	0.75954E-02	0.94162E-02	0.15629E-01	0.32074E-01	0.77734E-01	0.21588E+00	0.67212E+00
2.3	0.80877E-02	0.62655E-02	0.76886E-02	0.12645E-01	0.25739E-01	0.61896E-01	0.17061E+00	0.52775E+00
2.4	0.67377E-02	0.51566E-02	0.62650E-02	0.10217E-01	0.20615E-01	0.49199E-01	0.13464E+00	0.41375E+00
2.5	0.55011E-02	0.42393E-02	0.58946E-02	0.82301E-02	0.16481E-01	0.39038E-01	0.10611E+00	0.32392E+00
2.6	0.46321E-02	0.34794E-02	0.41364E-02	0.66208E-02	0.13152E-01	0.36923E-01	0.83467E-01	0.25316E+00
2.7	0.38285E-02	0.28976E-02	0.33484E-02	0.53159E-02	0.10470E-01	0.24452E-01	0.65552E-01	0.19754E+00
2.8	0.31549E-02	0.23793E-02	0.27064E-02	0.42602E-02	0.83301E-02	0.19382E-01	0.51394E-01	0.15373E+00
2.9	0.25970E-02	0.19659E-02	0.21831E-02	0.34074E-02	0.66117E-02	0.15218E-01	0.40229E-01	0.11973E+00
3.0	0.21315E-02	0.16319E-02	0.17579E-02	0.27206E-02	0.52384E-02	0.11966E-01	0.31438E-01	0.92960E-01

TABLE 2

Z	W(Z, 0)	W(Z, 1)	W(Z, 2)	W(Z, 3)	W(Z, 4)	W(Z, 5)	W(Z, 6)	W(Z, 7)
-10.0	0.11811E+01	0.99948E+01	0.99986E+02	0.10029E+04	0.10808E+05	0.10286E+06	0.10401E+07	0.10703E+08
-9.9	0.10914E+01	0.98656E+01	0.97996E+02	0.97235E+03	0.96854E+04	0.97061E+05	0.98035E+06	0.99959E+07
-9.8	0.10717E+01	0.97760E+01	0.96033E+02	0.94325E+03	0.93824E+04	0.92315E+05	0.92359E+06	0.93298E+07
-9.7	0.10437E+01	0.96710E+01	0.94008E+02	0.91474E+03	0.89389E+04	0.87758E+05	0.86954E+06	0.87024E+07
-9.6	0.10153E+01	0.95679E+01	0.92164E+02	0.88674E+03	0.85705E+04	0.83382E+05	0.81820E+06	0.81118E+07
-9.5	0.98307E+00	0.94679E+01	0.90260E+02	0.85942E+03	0.82213E+04	0.79185E+05	0.76944E+06	0.75562E+07
-9.4	0.95344E+00	0.93712E+01	0.88377E+02	0.83264E+03	0.78829E+04	0.75159E+05	0.72315E+06	0.70340E+07
-9.3	0.92722E+00	0.92772E+01	0.86512E+02	0.86641E+03	0.75552E+04	0.71301E+05	0.67927E+06	0.65433E+07
-9.2	0.90703E+00	0.91855E+01	0.84665E+02	0.78071E+03	0.72377E+04	0.67062E+05	0.63759E+06	0.60826E+07
-9.1	0.89520E+00	0.91956E+01	0.82837E+02	0.75568E+03	0.69304E+04	0.64080E+05	0.59886E+06	0.56522E+07
-9.0	0.89320E+00	0.90042E+01	0.81027E+02	0.73102E+03	0.66332E+04	0.60070E+05	0.56005E+06	0.52446E+07
-8.9	0.90688E+00	0.89165E+01	0.79235E+02	0.70690E+03	0.63456E+04	0.57426E+05	0.52523E+06	0.48649E+07
-8.8	0.91695E+00	0.84257E+01	0.77461E+02	0.68346E+03	0.60675E+04	0.54323E+05	0.49171E+06	0.45290E+07
-8.7	0.94601E+00	0.87328E+01	0.75704E+02	0.66056E+03	0.57987E+04	0.51397E+05	0.46001E+06	0.41760E+07
-8.6	0.96986E+00	0.86374E+01	0.73968E+02	0.63806E+03	0.55390E+04	0.48523E+05	0.43075E+06	0.38646E+07
-8.5	0.10520E+01	0.85388E+01	0.72251E+02	0.61613E+03	0.52882E+04	0.45917E+05	0.40170E+06	0.35736E+07
-8.4	0.10334E+01	0.84349E+01	0.78552E+02	0.59474E+03	0.50461E+04	0.43233E+05	0.37503E+06	0.33518E+07
-8.3	0.10454E+01	0.83319E+01	0.68875E+02	0.57379E+03	0.48124E+04	0.40769E+05	0.34986E+06	0.30681E+07
-8.2	0.10894E+01	0.82242E+01	0.67220E+02	0.55338E+03	0.45876E+04	0.38420E+05	0.32613E+06	0.28117E+07
-8.1	0.11172E+01	0.81144E+01	0.65586E+02	0.53346E+03	0.43696E+04	0.36181E+05	0.30373E+06	0.25913E+07
-8.0	0.11108E+01	0.80036E+01	0.63974E+02	0.51402E+03	0.41601E+04	0.34048E+05	0.28267E+06	0.23861E+07
-7.9	0.11172E+01	0.78312E+01	0.62384E+02	0.49507E+03	0.39583E+04	0.32019E+05	0.26285E+06	0.21953E+07
-7.8	0.11191E+01	0.77799E+01	0.60818E+02	0.47659E+03	0.37640E+04	0.30899E+05	0.24422E+06	0.22179E+07
-7.7	0.10955E+01	0.76609E+01	0.59273E+02	0.45858E+03	0.35770E+04	0.28254E+05	0.22671E+06	0.18531E+07
-7.6	0.10A56E+01	0.75620E+01	0.57750E+02	0.44102E+03	0.33971E+04	0.26511E+05	0.21030E+06	0.17552E+07
-7.5	0.10375E+01	0.74569E+01	0.56247E+02	0.42392E+03	0.32241E+04	0.24856E+05	0.19479E+06	0.15954E+07
-7.4	0.10024E+01	0.73551E+01	0.54767E+02	0.40727E+03	0.30579E+04	0.23286E+05	0.18044E+06	0.14273E+07
-7.3	0.96396E+00	0.72565E+01	0.53306E+02	0.39104E+03	0.28983E+04	0.21797E+05	0.16694E+06	0.13356E+07
-7.2	0.93641E+00	0.71512E+01	0.51866E+02	0.37520E+03	0.27452E+04	0.20380E+05	0.15429E+06	0.11932E+07
-7.1	0.90444E+00	0.70590E+01	0.50446E+02	0.35994E+03	0.25984E+04	0.19051E+05	0.14240E+06	0.10894E+07
-7.0	0.80689E+00	0.69794E+01	0.49036E+02	0.34502E+03	0.24576E+04	0.17787E+05	0.13141E+06	0.99357E+06
-6.9	0.87066E+00	0.63915E+01	0.47649E+02	0.33052E+03	0.23219E+04	0.16593E+05	0.12112E+06	0.93524E+06
-6.8	0.86726E+00	0.68245E+01	0.48279E+02	0.31643E+03	0.21925E+04	0.15466E+05	0.11149E+06	0.82387E+06
-6.7	0.87272F+00	0.67176E+01	0.44927E+02	0.32677E+03	0.20687E+04	0.14399E+05	0.10255E+06	0.74902E+06
-6.6	0.88311E+00	0.66301E+01	0.43592E+02	0.28947E+03	0.19563E+04	0.13395E+05	0.94194E+05	0.68319E+06
-6.5	0.90348E+00	0.65408E+01	0.42275E+02	0.27459E+03	0.18371E+04	0.12448E+05	0.86444E+05	0.61922E+06
-6.4	0.93635E+00	0.64429E+01	0.49768E+02	0.26414E+03	0.17289E+04	0.11357E+05	0.79245E+05	0.59926E+06
-6.3	0.94210E+00	0.63349E+01	0.30499E+02	0.25204E+03	0.16257E+04	0.10718E+05	0.72565E+05	0.56939E+06
-6.2	0.99692E+00	0.62566E+01	0.38435E+02	0.24629E+03	0.15273E+04	0.99363E+04	0.66373E+05	0.49733E+06
-6.1	0.10324E+01	0.61552E+01	0.37194E+02	0.22894E+03	0.14335E+04	0.91963E+04	0.66042E+05	0.41295E+06
-6.0	0.10606E+01	0.60502E+01	0.35973E+02	0.21797E+03	0.13441E+04	0.84961E+04	0.55336E+05	0.37234E+06
-5.9	0.10973E+01	0.59419E+01	0.34773E+02	0.20735E+03	0.12590E+04	0.78455E+04	0.52435E+05	0.33534E+06
-5.8	0.11227E+01	0.58369E+01	0.33598E+02	0.19710E+03	0.11781E+04	0.72364E+04	0.45913E+05	0.31144E+06
-5.7	0.11412E+01	0.57177E+01	0.32441E+02	0.18720E+03	0.11013E+04	0.66667E+04	0.41744E+05	0.27590E+06
-5.6	0.11521E+01	0.56229E+01	0.31319E+02	0.17703E+03	0.10283E+04	0.61364E+04	0.37903E+05	0.24312E+06
-5.5	0.11546E+01	0.54575E+01	0.36220E+02	0.16841E+03	0.95915E+03	0.56377E+04	0.34375E+05	0.21704E+06
-5.4	0.11483E+01	0.53723E+01	0.29114E+02	0.15951E+03	0.89358E+03	0.51747E+04	0.31133E+05	0.19493E+06
-5.3	0.11339E+01	0.52381E+01	0.28051E+02	0.15094E+03	0.83151E+03	0.47435E+04	0.28160E+05	0.17419E+06
-5.2	0.11128E+01	0.51458E+01	0.27011E+02	0.14326E+03	0.77279E+03	0.43406E+04	0.25403E+05	0.15549E+06
-5.1	0.10838E+01	0.50359E+01	0.25993E+02	0.13473E+03	0.71732E+03	0.39702E+04	0.22942E+05	0.13853E+06
-5.0	0.10507E+01	0.49292E+01	0.24996E+02	0.12788E+03	0.66497E+03	0.36248E+04	0.20665E+05	0.12228E+06

TABLE 2   (CONTINUED)

z	W(z, 0)	W(z, 1)	W(z, 2)	W(z, 3)	W(z, 4)	W(z, 5)	W(z, 6)	W(z, 7)
-5.0	0.10507E-01	0.49292E-01	0.24996E-02	0.12708E-03	0.66497E-03	0.36248E-04	0.20665E-05	0.12328E-06
-4.9	0.10143E-01	0.48259E-01	0.24321E-02	0.11973E-03	0.61562E-03	0.33048E-04	0.18588E-05	0.10955E-06
-4.8	0.97648E-00	0.47263E-01	0.23666E-02	0.11267E-03	0.56915E-03	0.30087E-04	0.16695E-05	0.97213E-05
-4.7	0.93903E-00	0.46306E-01	0.22130E-02	0.10589E-03	0.52544E-03	0.27351E-04	0.14973E-05	0.86136E-05
-4.6	0.90382E-00	0.45385E-01	0.21213E-02	0.99366E-02	0.48440E-03	0.24828E-04	0.13408E-05	0.76211E-05
-4.5	0.87239E-00	0.44497E-01	0.20314E-02	0.93158E-02	0.44590E-03	0.22503E-04	0.11990E-05	0.67330E-05
-4.4	0.84605E-00	0.43638E-01	0.19433E-02	0.87195E-02	0.40984E-03	0.20365E-04	0.10704E-05	0.59395E-05
-4.3	0.82610E-00	0.42802E-01	0.18569E-02	0.81495E-02	0.37611E-03	0.18401E-04	0.95423E-04	0.52315E-05
-4.2	0.81370E-00	0.41984E-01	0.17721E-02	0.76053E-02	0.34461E-03	0.16600E-04	0.84930E-04	0.46009E-05
-4.1	0.80805E-00	0.41173E-01	0.16889E-02	0.70862E-02	0.31523E-03	0.14951E-04	0.75472E-04	0.40451E-05
-4.0	0.81173E-00	0.40364E-01	0.16074E-02	0.65917E-02	0.28788E-03	0.13444E-04	0.66961E-04	0.35421E-05
-3.9	0.82265E-00	0.39547E-01	0.15275E-02	0.61215E-02	0.26247E-03	0.12069E-04	0.56311E-04	0.31066E-05
-3.8	0.84109E-00	0.38716E-01	0.14492E-02	0.56751E-02	0.23888E-03	0.10816E-04	0.52453E-04	0.27099E-05
-3.7	0.86622E-00	0.37863E-01	0.13726E-02	0.52519E-02	0.21703E-03	0.96775E-03	0.46310E-04	0.23446E-05
-3.6	0.89715E-00	0.36981E-01	0.12978E-02	0.48513E-02	0.19684E-03	0.86434E-03	0.40819E-04	0.20600E-05
-3.5	0.93274E-00	0.36067E-01	0.12247E-02	0.44735E-02	0.17819E-03	0.77065E-03	0.35919E-04	0.17617E-05
-3.4	0.97177E-00	0.35115E-01	0.11535E-02	0.41163E-02	0.16102E-03	0.68590E-03	0.31554E-04	0.15559E-05
-3.3	0.10128E-01	0.34123E-01	0.10843E-02	0.37897E-02	0.14525E-03	0.60940E-03	0.27671E-04	0.13499E-05
-3.2	0.10547E-01	0.33089E-01	0.10171E-02	0.34655E-02	0.13075E-03	0.54045E-03	0.24226E-04	0.11675E-05
-3.1	0.10908E-01	0.32013E-01	0.95197E-01	0.31702E-02	0.11748E-03	0.47844E-03	0.21172E-04	0.10088E-05
-3.0	0.11330E-01	0.30898E-01	0.88905E-01	0.28941E-02	0.10536E-03	0.42278E-03	0.18472E-04	0.87024E-04
-2.9	0.11711E-01	0.29745E-01	0.82841E-01	0.26366E-02	0.54308E-02	0.37290E-03	0.16087E-04	0.74945E-04
-2.8	0.12029E-01	0.28557E-01	0.77010E-01	0.23968E-02	0.64247E-02	0.32830E-03	0.13986E-04	0.64435E-04
-2.7	0.12297E-01	0.27340E-01	0.71419E-01	0.21743E-02	0.75110E-02	0.28850E-03	0.12138E-04	0.55306E-04
-2.6	0.12507E-01	0.26102E-01	0.66075E-01	0.19684E-02	0.66831E-02	0.25305E-03	0.10515E-04	0.47389E-04
-2.5	0.12652E-01	0.24841E-01	0.60981E-01	0.17776E-02	0.59344E-02	0.22154E-03	0.90935E-03	0.40537E-04
-2.4	0.12730E-01	0.23572E-01	0.56130E-01	0.16019E-02	0.52590E-02	0.19358E-03	0.78499E-03	0.34617E-04
-2.3	0.12738E-01	0.22298E-01	0.51552E-01	0.14405E-02	0.46510E-02	0.16884E-03	0.67642E-03	0.29511E-04
-2.2	0.12676E-01	0.21126E-01	0.47220E-01	0.12924E-02	0.41048E-02	0.14697E-03	0.58181E-03	0.25114E-04
-2.1	0.12546E-01	0.19765E-01	0.43141E-01	0.11569E-02	0.36154E-02	0.12769E-03	0.49954E-03	0.21336E-04
-2.0	0.12330E-01	0.18519E-01	0.39313E-01	0.10333E-02	0.21777E-02	0.11073E-03	0.42812E-03	0.18096E-04
-1.9	0.12093E-01	0.17297E-01	0.35732E-01	0.92078E-01	0.27873E-02	0.95837E-02	0.36625E-03	0.15321E-04
-1.8	0.11779E-01	0.16103E-01	0.32393E-01	0.81865E-01	0.24397E-02	0.82786E-02	0.31274E-03	0.12049E-04
-1.7	0.11414E-01	0.14943E-01	0.29289E-01	0.72619E-01	0.21311E-02	0.71375E-02	0.26657E-03	0.10525E-04
-1.6	0.11104E-01	0.13821E-01	0.26413E-01	0.64269E-01	0.18576E-02	0.61417E-02	0.22680E-03	0.92216E-03
-1.5	0.10526E-01	0.12743E-01	0.23757E-01	0.56749E-01	0.16158E-02	0.52746E-02	0.19262E-03	0.77367E-03
-1.4	0.10078E-01	0.11711E-01	0.21313E-01	0.49994E-01	0.14026E-02	0.45211E-02	0.16328E-03	0.64937E-03
-1.3	0.95738E-00	0.10728E-01	0.19070E-01	0.43941E-01	0.12149E-02	0.38678E-02	0.13816E-03	0.54429E-03
-1.2	0.90500E-00	0.97266E-00	0.17018E-01	0.38533E-01	0.10502E-02	0.33024E-02	0.11669E-03	0.45539E-03
-1.1	0.85234E-00	0.89175E-00	0.15147E-01	0.33712E-01	0.90507E-01	0.28141E-02	0.98381E-02	0.37998E-03
-1.0	0.79901E-00	0.80917E-00	0.13447E-01	0.29428E-01	0.77978E-01	0.23934E-02	0.82789E-02	0.31672E-03
-0.9	0.74559E-00	0.73194E-00	0.11907E-01	0.25628E-01	0.66982E-01	0.20317E-02	0.69541E-02	0.26353E-03
-0.8	0.69277E-00	0.66003E-00	0.10516E-01	0.22268E-01	0.57166E-01	0.17213E-02	0.58307E-02	0.21849E-03
-0.7	0.64101E-00	0.59335E-00	0.92635E-00	0.19305E-01	0.49114E-01	0.14554E-02	0.48797E-02	0.18150E-03
-0.6	0.59069E-00	0.53178E-00	0.81392E-00	0.16697E-01	0.41925E-01	0.12282E-02	0.40764E-02	0.15023E-03
-0.5	0.54214E-00	0.47515E-00	0.71331E-00	0.14409E-01	0.35714E-01	0.10345E-02	0.33991E-02	0.12414E-03
-0.4	0.49563E-00	0.42328E-00	0.62354E-00	0.12407E-01	0.30360E-01	0.86968E-01	0.28292E-02	0.10240E-03
-0.3	0.45136E-00	0.37595E-00	0.54369E-00	0.10658E-01	0.25755E-01	0.72969E-01	0.23509E-02	0.84315E-02
-0.2	0.40949E-00	0.33293E-00	0.47267E-00	0.91356E-00	0.21803E-01	0.61105E-01	0.19493E-02	0.69307E-02
-0.1	0.37013E-00	0.29397E-00	0.41025E-00	0.78128E-00	0.18419E-01	0.51071E-01	0.16136E-02	0.56872E-02
0.0	0.33333E-00	0.25882E-00	0.35503E-00	0.66667E-00	0.15529E-01	0.42603E-01	0.13333E-02	0.46667E-02

TABLE 2   (CONTINUED)

Z	W(Z, 0)	W(Z, 1)	W(Z, 2)	W(Z, 3)	W(Z, 4)	W(Z, 5)	W(Z, 6)	W(Z, 7)
0.0	0.33333E+00	1.25882E+00	0.35503E+00	0.66667E+00	0.15929E+01	0.42603E+01	0.13333E+02	0.40587E+02
0.1	0.29912E+00	1.22722E+00	0.30648E+00	0.56760E+00	0.13065E+01	0.35471E+01	0.11997E+02	0.34097E+02
0.2	0.26748E+00	0.19991E+00	0.26392E+00	0.48216E+00	0.10970E+01	0.29477E+01	0.96540E+01	0.31100E+02
0.3	0.23836E+00	0.17364E+00	0.22672E+00	0.40871E+00	0.91921E+00	0.24448E+01	0.74488E+01	0.25344E+02
0.4	0.21169E+00	1.15116E+00	0.19428E+00	0.34567E+00	0.76666E+00	0.20239E+01	0.61039E+01	0.20618E+02
0.5	0.18738E+00	0.13122E+00	0.16608E+00	0.29172E+00	0.64148E+00	0.16723E+01	0.49982E+01	0.16745E+02
0.6	0.16532E+00	0.11136E+00	0.14164E+00	0.24565E+00	0.53423E+00	0.13791E+01	0.40855E+01	0.13576E+02
0.7	0.14538E+00	9.98687E-01	0.12054E+00	0.20641E+00	0.44444E+00	0.11352E+01	0.33335E+01	0.10988E+02
0.8	0.12744E+00	1.84462E-01	0.10228E+00	0.17306E+00	0.36833E+00	0.93266E+00	0.27190E+01	0.88778E+01
0.9	0.11136E+00	0.72537E-01	0.86604E-01	0.14477E+00	0.30491E+00	0.76482E+00	0.22073E+01	0.71608E+01
1.0	0.97016E-01	7.62131E-01	0.73161E-01	0.12087E+00	0.25192E+00	0.62601E+00	0.17914E+01	0.57661E+01
1.1	0.84260E-01	0.53585E-01	0.61661E-01	0.10069E+00	0.20772E+00	0.51144E+00	0.14513E+01	0.46352E+01
1.2	0.72002E-01	1.45231E-01	0.51849E-01	0.83706E-01	0.17094E+00	0.41706E+00	0.11736E+01	0.37190E+01
1.3	0.62092E-01	1.38444E-01	0.43498E-01	0.69438E-01	0.14039E+00	0.33946E+00	0.94745E+00	0.29801E+01
1.4	0.54227E-01	1.32392E-01	0.36409E-01	0.57484E-01	0.11508E+00	0.27580E+00	0.76350E+00	0.23835E+01
1.5	0.46547E-01	1.27562E-01	0.30406E-01	0.47484E-01	0.94147E-01	0.22366E+00	0.61419E+00	0.19031E+01
1.6	0.39641E-01	1.23259E-01	0.25336E-01	0.39144E-01	0.76872E-01	0.18104E+00	0.49322E+00	0.15173E+01
1.7	0.34006E-01	1.19565E-01	0.21064E-01	0.32202E-01	0.62646E-01	0.14620E+00	0.39538E+00	0.12072E+01
1.8	0.28945E-01	1.16423E-01	0.17474E-01	0.26437E-01	0.50954E-01	0.11797E+00	0.31640E+00	0.95910E+00
1.9	0.24570E-01	0.13753E-01	0.14464E-01	0.21660E-01	0.41364E-01	0.94971E-01	0.25275E+00	0.76370E+00
2.0	0.20801E-01	0.11489E-01	0.11946E-01	0.17710E-01	0.33516E-01	0.76310E-01	0.20156E+00	0.60235E+00
2.1	0.17562E-01	9.95752E-02	0.98446E-02	0.14451E-01	0.27105E-01	0.61216E-01	0.16046E+00	0.47617E+00
2.2	0.14789E-01	9.79613E-02	0.80756E-02	0.11768E-01	0.21878E-01	0.49015E-01	0.12758E+00	0.37580E+00
2.3	0.12421E-01	3.66639E-02	0.66430E-02	0.95639E-02	0.17627E-01	0.39175E-01	0.10117E+00	0.29619E+00
2.4	0.10406E-01	0.54653E-02	0.54395E-02	0.77572E-02	0.14174E-01	0.31255E-01	0.80131E-01	0.23292E+00
2.5	0.86693E-02	1.45126E-02	0.44445E-02	0.62793E-02	0.11377E-01	0.24892E-01	0.63357E-01	0.18292E+00
2.6	0.72470E-02	0.37174E-02	0.36239E-02	0.50730E-02	0.91147E-02	0.19789E-01	0.50009E-01	0.14342E+00
2.7	0.60259E-02	1.30555E-02	0.29487E-02	0.40905E-02	0.72888E-02	0.15705E-01	0.39407E-01	0.11226E+00
2.8	0.49978E-02	1.25058E-02	0.23943E-02	0.32918E-02	0.58179E-02	0.12441E-01	0.31000E-01	0.77735E-01
2.9	0.41351E-02	0.20504E-02	0.19401E-02	0.26439E-02	0.46353E-02	0.98386E-02	0.24346E-01	0.68455E-01
3.0	0.34138E-02	3.16741E-02	0.15688E-02	0.21194E-02	0.36863E-02	0.77678E-02	0.19088E-01	0.53326E-01

TABLE 3

Z	X(Z,1)	X(Z,2)	X(Z,3)	Y(Z,1)	Y(Z,2)	Y(Z,3)
-10.0	0.99995	0.99392	0.98300	0.99987	0.99569	0.98595
-9.9	0.99917	0.99383	0.98259	1.00018	0.99578	0.98573
-9.8	0.99919	0.99366	0.98207	1.00031	0.99567	0.98529
-9.7	0.99914	0.99340	0.98146	1.00030	0.99540	0.98471
-9.6	0.99904	0.99307	0.98076	1.00017	0.99508	0.98397
-9.5	0.99885	0.99266	0.97998	0.99989	0.99444	0.98308
-9.4	0.99857	0.99214	0.97909	0.99942	0.99371	0.98211
-9.3	0.99824	0.99159	0.97814	0.99885	0.99290	0.98086
-9.2	0.99791	0.99104	0.97718	0.99827	0.99210	0.97971
-9.1	0.99757	0.99049	0.97620	0.99765	0.99131	0.97855
-9.0	0.99722	0.98995	0.97520	0.99704	0.99055	0.97740
-8.9	0.99693	0.98945	0.97424	0.99651	0.98091	0.97637
-8.8	0.99672	0.98925	0.97335	0.99615	0.98948	0.97549
-8.7	0.99660	0.98874	0.97251	0.99596	0.98923	0.97477
-8.6	0.99654	0.98848	0.97171	0.99591	0.98913	0.97417
-8.5	0.99658	0.98831	0.97095	0.99606	0.98922	0.97371
-8.4	0.99674	0.98822	0.97025	0.99643	0.98951	0.97341
-8.3	0.99696	0.98818	0.96957	0.99696	0.98992	0.97317
-8.2	0.99721	0.98813	0.96884	0.99756	0.99035	0.97291
-8.1	0.99750	0.98807	0.96807	0.99826	0.99078	0.97261
-8.0	0.99780	0.98790	0.96723	0.99899	0.99110	0.97223
-7.9	0.99807	0.98782	0.96628	0.99969	0.99145	0.97168
-7.8	0.99824	0.98751	0.96517	1.00022	0.99147	0.97085
-7.7	0.99831	0.98707	0.96387	1.00058	0.99124	0.96974
-7.6	0.99830	0.98649	0.96242	1.00077	0.99076	0.96834
-7.5	0.99819	0.98574	0.96077	1.00071	0.98995	0.96664
-7.4	0.99783	0.98480	0.95889	1.00033	0.98880	0.96457
-7.3	0.99738	0.98371	0.95684	0.98970	0.98738	0.96222
-7.2	0.99683	0.98251	0.95463	0.98986	0.98574	0.95964
-7.1	0.99618	0.98119	0.95228	0.99781	0.98392	0.95686
-7.0	0.99542	0.97977	0.94978	0.99659	0.98199	0.95300
-6.9	0.99542	0.97834	0.94721	0.99521	0.97997	0.95091
-6.8	0.99385	0.97693	0.94461	0.99380	0.97808	0.94796
-6.7	0.99310	0.97556	0.94198	0.99261	0.97633	0.94538
-6.6	0.99240	0.97424	0.93934	0.99144	0.97477	0.94233
-6.5	0.99181	0.97304	0.93671	0.99046	0.97349	0.93970
-6.4	0.99138	0.97198	0.93413	0.98979	0.97259	0.93734
-6.3	0.99110	0.97104	0.93156	0.98942	0.97204	0.93516
-6.2	0.99096	0.97022	0.92898	0.98937	0.97182	0.93312
-6.1	0.99099	0.96949	0.92638	0.98968	0.97192	0.93119
-6.0	0.99121	0.96887	0.92373	0.99038	0.97234	0.92935
-5.9	0.99158	0.96828	0.92098	0.99142	0.97298	0.92745
-5.8	0.99203	0.96764	0.91802	0.99270	0.97368	0.92534
-5.7	0.99257	0.96693	0.91484	0.99422	0.97440	0.92294
-5.6	0.99315	0.96608	0.91137	0.99591	0.97500	0.92012
-5.5	0.99371	0.96501	0.90751	0.99765	0.97531	0.91669
-5.4	0.99415	0.96361	0.90319	0.99929	0.97514	0.91250
-5.3	0.99447	0.96184	0.89836	1.00078	0.97439	0.90743
-5.2	0.99461	0.95964	0.89298	1.00203	0.97298	0.90148
-5.1	0.99449	0.95694	0.88698	1.00280	0.97066	0.89427
-5.0	0.99405	0.95366	0.88031	1.00325	0.96737	0.88594

TABLE 3   (CONTINUED)
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Z	X(Z,1)	X(Z,2)	X(Z,3)	Y(Z,1)	Y(Z,2)	Y(Z,3)
-5.0	0.99405	0.95366	0.88131	1.00325	0.96737	0.88594
-4.9	0.99327	0.94981	0.87297	1.00304	0.96304	0.87640
-4.8	0.99214	0.94534	0.86498	1.00225	0.95766	0.86567
-4.7	0.99000	0.94027	0.85633	1.00077	0.95115	0.85374
-4.6	0.98864	0.93455	0.84762	0.99856	0.94350	0.84064
-4.5	0.98627	0.92825	0.83713	0.99504	0.93478	0.82649
-4.4	0.98352	0.92145	0.82671	0.99205	0.92508	0.81141
-4.3	0.98040	0.91403	0.81581	0.98780	0.91446	0.79551
-4.2	0.97680	0.90618	0.80448	0.98288	0.90297	0.77889
-4.1	0.97307	0.89793	0.79282	0.97742	0.89070	0.76175
-4.0	0.96899	0.89936	0.78092	0.97149	0.87805	0.74424
-3.9	0.96446	0.88051	0.76883	0.96513	0.86485	0.72649
-3.8	0.96011	0.87144	0.75662	0.95840	0.85129	0.70862
-3.7	0.95542	0.86223	0.74438	0.95140	0.83753	0.69079
-3.6	0.95062	0.85296	0.73218	0.94423	0.82369	0.67312
-3.5	0.94575	0.84367	0.72007	0.93695	0.80985	0.65571
-3.4	0.94083	0.83439	0.70810	0.92958	0.79610	0.63862
-3.3	0.93592	0.82520	0.69632	0.92221	0.78253	0.62196
-3.2	0.93102	0.81614	0.68479	0.91491	0.76922	0.60578
-3.1	0.92620	0.80723	0.67352	0.90772	0.75622	0.59013
-3.0	0.92143	0.79856	0.66255	0.90063	0.74356	0.57503
-2.9	0.91676	0.78998	0.65188	0.89370	0.73128	0.56051
-2.8	0.91222	0.78172	0.64157	0.88699	0.71944	0.54660
-2.7	0.90780	0.77369	0.63159	0.88049	0.70803	0.53329
-2.6	0.90350	0.76592	0.62196	0.87418	0.69706	0.52058
-2.5	0.89934	0.75841	0.61269	0.86811	0.68653	0.50849
-2.4	0.89534	0.75118	0.60378	0.86229	0.67647	0.49693
-2.3	0.89149	0.74422	0.59523	0.85672	0.66685	0.48597
-2.2	0.88778	0.73754	0.58702	0.85137	0.65767	0.47556
-2.1	0.88422	0.73111	0.57915	0.84626	0.64892	0.46567
-2.0	0.88082	0.72496	0.57162	0.84139	0.64060	0.45631
-1.9	0.87756	0.71907	0.56441	0.83676	0.63268	0.44743
-1.8	0.87444	0.71343	0.55752	0.83233	0.62514	0.43902
-1.7	0.87146	0.70803	0.55093	0.82813	0.61798	0.43105
-1.6	0.86862	0.70288	0.54464	0.82413	0.61118	0.42350
-1.5	0.86592	0.69796	0.53864	0.82034	0.60474	0.41636
-1.4	0.86333	0.69325	0.53290	0.81672	0.59860	0.40959
-1.3	0.86087	0.68876	0.52742	0.81338	0.59279	0.40319
-1.2	0.85853	0.68448	0.52219	0.81006	0.58728	0.39711
-1.1	0.85629	0.68038	0.51719	0.80696	0.58203	0.39136
-1.0	0.85416	0.67647	0.51242	0.80404	0.57705	0.38590
-0.9	0.85213	0.67274	0.50787	0.80125	0.57232	0.38073
-0.8	0.85020	0.66918	0.50352	0.79861	0.56783	0.37583
-0.7	0.84836	0.66579	0.49937	0.79611	0.56357	0.37118
-0.6	0.84661	0.66254	0.49540	0.79373	0.55952	0.36676
-0.5	0.84494	0.65944	0.49161	0.79146	0.55566	0.36297
-0.4	0.84335	0.65648	0.48799	0.78931	0.55200	0.35858
-0.3	0.84183	0.65365	0.48452	0.78726	0.54851	0.35480
-0.2	0.84038	0.65095	0.48121	0.78532	0.54519	0.35119
-0.1	0.83900	0.64837	0.47804	0.78347	0.54203	0.34777
0.0	0.83768	0.64590	0.47501	0.78170	0.53902	0.34451

TABLE 2

Z	W(Z, 0)	W(Z, 1)	W(Z, 2)	W(Z, 3)	W(Z, 4)	W(Z, 5)
-10.0	0.11911E+01	0.99948E+01	0.99986E+02	0.19026E+04	0.10000E+05	0.10200E+06
-9.9	0.10914E+01	0.98659E+01	0.97998E+02	0.97996E+03	0.96894E+04	0.97861E+05
-9.8	0.10719E+01	0.97769E+01	0.96033E+02	0.94329E+03	0.53024E+04	0.92515E+05
-9.7	0.10475E+01	0.96710E+01	0.94088E+02	0.91474E+03	0.89309E+04	0.87758E+05
-9.6	0.10153E+01	0.95679E+01	0.92164E+02	0.88674E+03	0.85705E+04	0.83382E+05
-9.5	0.98307E+00	0.94679E+01	0.92260E+02	0.85942E+03	0.82213E+04	0.79185E+05
-9.4	0.95344E+00	0.93712E+01	0.88377E+02	0.83264E+03	0.78829E+04	0.75159E+05
-9.3	0.92722E+00	0.92772E+01	0.86512E+02	0.80641E+03	0.75552E+04	0.71301E+05
-9.2	0.90703E+00	0.91855E+01	0.84465E+02	0.78071E+03	0.72377E+04	0.67602E+05
-9.1	0.89520E+00	0.90954E+01	0.82837E+02	0.75560E+03	0.69304E+04	0.64060E+05
-9.0	0.89320E+00	0.90062E+01	0.81027E+02	0.73102E+03	0.66332E+04	0.60670E+05
-8.9	0.90688E+00	0.89169E+01	0.79235E+02	0.70690E+03	0.63456E+04	0.57426E+05
-8.8	0.91695E+00	0.88257E+01	0.77461E+02	0.68340E+03	0.60675E+04	0.54323E+05
-8.7	0.94601E+00	0.87328E+01	0.75704E+02	0.66050E+03	0.57987E+04	0.51357E+05
-8.6	0.96986E+00	0.86374E+01	0.73966E+02	0.63806E+03	0.55393E+04	0.48523E+05
-8.5	0.10520E+01	0.85388E+01	0.72251E+02	0.61613E+03	0.52888E+04	0.45817E+05
-8.4	0.10348E+01	0.84369E+01	0.78952E+02	0.59476E+03	0.50461E+04	0.43233E+05
-8.3	0.10646E+01	0.83319E+01	0.68875E+02	0.57376E+03	0.48124E+04	0.40769E+05
-8.2	0.10894E+01	0.82242E+01	0.67220E+02	0.55338E+03	0.45870E+04	0.38420E+05
-8.1	0.11172E+01	0.81144E+01	0.65986E+02	0.53346E+03	0.43696E+04	0.36181E+05
-8.0	0.11149E+01	0.80030E+01	0.63974E+02	0.51409E+03	0.41601E+04	0.34048E+05
-7.9	0.11179E+01	0.78912E+01	0.62384E+02	0.49507E+03	0.39583E+04	0.32019E+05
-7.8	0.11291E+01	0.77799E+01	0.60818E+02	0.47659E+03	0.37640E+04	0.30889E+05
-7.7	0.12095E+01	0.76699E+01	0.59273E+02	0.45854E+03	0.35770E+04	0.28254E+05
-7.6	0.10456E+01	0.75620E+01	0.57750E+02	0.44103E+03	0.33971E+04	0.26511E+05
-7.5	0.10375E+01	0.74569E+01	0.56247E+02	0.42397E+03	0.32241E+04	0.24856E+05
-7.4	0.10624E+01	0.73551E+01	0.54767E+02	0.40727E+03	0.30577E+04	0.23286E+05
-7.3	0.96159E+00	0.72565E+01	0.53306E+02	0.39106E+03	0.28983E+04	0.21797E+05
-7.2	0.93641E+00	0.71612E+01	0.51866E+02	0.37520E+03	0.27455E+04	0.20386E+05
-7.1	0.92444E+00	0.70590E+01	0.56440E+02	0.35994E+03	0.25980E+04	0.19051E+05
-7.0	0.86805E+00	0.69794E+01	0.49036E+02	0.34502E+03	0.24570E+04	0.17787E+05
-6.9	0.87266E+00	0.68915E+01	0.47449E+02	0.33052E+03	0.23219E+04	0.16593E+05
-6.8	0.86729E+00	0.68245E+01	0.48279E+02	0.31643E+03	0.21925E+04	0.15464E+05
-6.7	0.87972E+00	0.67174E+01	0.44927E+02	0.30274E+03	0.20687E+04	0.14399E+05
-6.6	0.88311E+00	0.66301E+01	0.43592E+02	0.28947E+03	0.19503E+04	0.13395E+05
-6.5	0.90348E+00	0.65408E+01	0.42279E+02	0.27659E+03	0.18371E+04	0.12448E+05
-6.4	0.93635E+00	0.64492E+01	0.49976E+02	0.26414E+03	0.17289E+04	0.11557E+05
-6.3	0.94210E+00	0.63545E+01	0.39699E+02	0.25206E+03	0.16257E+04	0.11718E+05
-6.2	0.99692E+00	0.62566E+01	0.38435E+02	0.24020E+03	0.15273E+04	0.99363E+04
-6.1	0.10324E+01	0.61552E+01	0.37194E+02	0.22894E+03	0.14335E+04	0.91963E+04
-6.0	0.10606E+01	0.60502E+01	0.35973E+02	0.21797E+03	0.13441E+04	0.84961E+04
-5.9	0.10973E+01	0.59419E+01	0.34773E+02	0.20736E+03	0.12590E+04	0.78655E+04
-5.8	0.11227E+01	0.58309E+01	0.33596E+02	0.19712E+03	0.11781E+04	0.72364E+04
-5.7	0.11412E+01	0.57177E+01	0.32441E+02	0.18726E+03	0.11013E+04	0.66667E+04
-5.6	0.11521E+01	0.56029E+01	0.31359E+02	0.17963E+03	0.10283E+04	0.61344E+04
-5.5	0.11586E+01	0.54575E+01	0.36210E+02	0.16841E+03	0.95955E+03	0.56377E+04
-5.4	0.11483E+01	0.53723E+01	0.29114E+02	0.15954E+03	0.89350E+03	0.51747E+04
-5.3	0.11339E+01	0.52501E+01	0.28051E+02	0.15094E+03	0.83151E+03	0.47435E+04
-5.2	0.11120E+01	0.51458E+01	0.27011E+02	0.14268E+03	0.77279E+03	0.43424E+04
-5.1	0.10688E+01	0.50359E+01	0.25993E+02	0.13473E+03	0.71732E+03	0.39702E+04
-5.0	0.10507E+01	0.49292E+01	0.24996E+02	0.12788E+03	0.66497E+03	0.36240E+04