THE MAIN PROBLEM OF LUNAR THEORY SOLVED BY THE METHOD OF BROWN

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Abstract. Brown's method for solving the main problem of lunar theory has been adapted for the computation by machine with the help of an algebraic processor. Brown's results are first recovered and refined. The solution is then expanded to include most terms of order nine. The terms in the series for the longitude and latitude are listed with an accuracy of 0.000 01″ and of 0.000 001″ for the parallax.

1. Introduction

An analytic solution to the motion of the Moon is usually found by solving a three body problem under the simplifying assumption that the center of mass of the Earth–Moon system rotates on an elliptic orbit around the Sun. This is known as the main problem of lunar theory. The influence on the motion of the Moon by the planets, by the oblateness of the Earth, by the shape of the Moon and by other sources are treated later on as perturbations one at a time.

The most successful analytic solution for the motion of the Moon has been computed by Brown (1899–1908). It is based on the ideas of Hill and it has been used since 1925 in the official almanac for the computation of the lunar ephemerides. The quality of the observational data has improved dramatically so that the accuracy of Brown's solution is no longer adequate. This is true despite the fact that certain parts of the solution have been corrected and improved over the years in particular by Eckert and Eckert (1967). When the motion of the Moon has to be known today to a high degree of accuracy numerical integration is used. Nevertheless there exists interest in an improved analytical solution for the following three reasons: (1) Over long periods of time only the analytical solution is capable of accurately predicting the position of the Moon. (2) Only an analytical solution can identify the frequencies of a perturbing function and its effects on the amplitudes of the Moon's motion. (3) The discussion of the dependence on parameters is more easily done with an analytic solution. This is an important consideration as the values of some parameters which go into the physical model are determined by comparing the computed solution with the observations.

It is generally thought that a new treatment of the perturbations of the Moon would yield the greatest improvement in accuracy. In order to incorporate these perturbations an accurate solution to the main problem is needed. Several theories of the main problem

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have been computed recently by machine. Yet our contribution is not a duplication of any of these projects. Considering the awesome amount of series manipulation which is required one must realize that any individual effort is incapable of generating its own checks and cannot estimate its own errors caused by truncation, round off and loss of significance. Consistency checks come from comparing solutions generated by different programs which implement different algorithms and which run on different machines with distinct hardware. Only the decimal digits which are reproduced by different programs and preferably by distinct methods can be accepted as being correct. After the comparison with other solutions we believe that we have achieved an accuracy of 0.000 01″ for each term in the longitude and latitude and of 0.000 001″ for the terms in the parallax. This corresponds to a maximal error of 2 cm for each term used in the computation of the radial distance and of 20 cm in the other directions.

2. The Equations of Motion

We want to state the assumptions which we will make. Therefore we will derive the equations of the main problem from those of the three body problem. We will follow the development of Brown except that we use the Hamiltonian function instead of the corresponding differential equations to keep this section brief.

The general problem of three bodies in barycentric coordinates is described by the following Hamiltonian function

$$H = \frac{1}{2}\frac{M+E+S}{(M+S)S}|X_2|^2 + \frac{1}{2}\frac{E+M}{EM}|X_1|^2 - \frac{E+M}{|x_1|} - \frac{ES}{\left|x_2 + \frac{M}{E+M}x_1\right|} - \frac{MS}{\left|x_2 - \frac{E}{E+M}x_1\right|}.$$

The masses of the three bodies are denoted by S, E and M in accordance with the problem at hand. The vector x_1 points from the Earth to the Moon. The vector x_2 is based at the center of gravity of the Earth–Moon system and points to the Sun. The momenta conjugate to these position vectors are denoted by the corresponding capital letters. We will follow this convention throughout this section.

Let $r = |x_1|$, $r' = |x_2|$ and γ the angle enclosed by x_1 and x_2. Since $r \ll r'$ for the lunar problem we develop the last two terms in the Hamiltonian function with the help of the Legendre polynomials P_k and obtain

$$H = \frac{1}{2}\frac{M+E+S}{(M+E)S}|X_2|^2 - \frac{S(M+E)}{r'} + \frac{1}{2}\frac{M+E}{ME}|X_1|^2 - \frac{ME}{r} - \frac{M+E+S}{M+E}\sum_{k=2} c_k \frac{r^k}{r'^{k+1}} P_k(\cos\gamma). \tag{1}$$

The coefficients c_k are given by

$$c_k = \frac{E^{k-1} - (-M)^{k-1}}{(E+M)^{k-1}}.$$

The first two terms in the Hamiltonian (1) describe a two body problem of the Sun around the center of mass of the Earth and Moon. Although this two body problem is perturbed by the last term in Equation (1) this perturbation is small. The ratio of the perturbing function to the potential of the two body problem is approximately $(Mr^2):(Er'^2) \simeq 1:12\,000\,000$. As this perturbation is much weaker than many of the other influences like the planetary perturbations which we have already neglected, it will be sufficient to use the elliptic motion of the Sun around the Earth–Moon system. Later on, when we consider the other perturbations, it will be necessary to correct the motion of the Sun by considering at least the term for $k = 2$ in Equation (1).

The elliptic orbit of the Sun defines a fixed plane of reference. We choose our coordinate system so that the third coordinate axis is perpendicular to this plane. In particular the third coordinate of x_2 is identical to zero. The last statement is no longer true if the full three body problem is considered. As this perturbation changes the plane of reference in the same way as the indirect action of a planet effects it, we will postpone this refinement for a paper to follow.

The Hamiltonian function

$$H_M = \tfrac{1}{2}|X_1|^2 - \frac{E+M}{r} - \frac{S}{r'}\sum_{k=2} c_k \left(\frac{r}{r'}\right)^k P_k(\cos\gamma) \tag{2}$$

describes now the main problem of lunar theory. It is obtained from the second part of Equation (1) by scaling the momenta with $(E+M)/(EM)$. The elliptic values for the motion of the Sun are used in Equation (2) but no further simplifying assumptions will be made in contrast to Brown.

Let n and n' be the observed mean motions of the Moon and the Sun. We find the mean distance a' from Kepler's law

$$n'^2 a'^3 = E + M + S.$$

We define a by a similar equation

$$n^2 a^3 = E + M.$$

Because the Moon does not move on an elliptic orbit a will not represent the mean distance Earth to Moon. We define, furthermore,

$$m = n'/(n - n'),$$
$$q = (E+M)/(E+M+S),$$
$$\kappa = (E+M)/(n-n')^2 = (1+m)^2 a^3.$$

In order to arrive at the usual form of the equations of motion for the Moon we change from the coordinate system for x_1 to the coordinate system (x, y, z). It rotates uniformly

with angular velocity n' around an axis which is perpendicular to the ecliptic so that is positive x-axis always points to the mean position of the Sun. We also change time by

$$\tau = (n-n')(t-t_0) = (n-n')t + \epsilon - \epsilon' \tag{3}$$

where ϵ and ϵ' are the mean anomalies of the Moon and Sun at time $t = 0$. The Hamiltonian (2) in the new variables reads then

$$H_M = \tfrac{1}{2}(X^2 + Y^2 + Z^2) + m(Xy - Yx) - \frac{\kappa}{r} - \Omega,$$

where

$$\Omega = \frac{(1-q)m^2a'^3}{r'} \sum_{k=2} c_k \left(\frac{r}{r'}\right)^k P_k(\cos\gamma).$$

The solution will be found as multiple Fourier series. In terms of the usual Delaunay elements it has the form

$$\begin{aligned} x &= b\sum A_\nu \cos(\nu_1 l + \nu_2 l' + \nu_3 F + \nu_4 D), \\ y &= b\sum B_\nu \sin(\nu_1 l + \nu_2 l' + \nu_3 F + \nu_4 D), \\ z &= b\sum C_\nu \sin(\nu_1 l + \nu_2 l' + \nu_3 F + \nu_4 D). \end{aligned}$$

Summation is over the integer quadruples $\nu = (\nu_1, \nu_2, \nu_3, \nu_4)$. The scale factor b is introduced to make the coefficients dimensionless. The value for b will be chosen later.

We finally replace x and y by complex position coordinates by

$$\begin{aligned} u &= (x + iy)/b, \\ v &= (x - iy)/b. \end{aligned}$$

We have a simplectic transformation with factor b^{-2} if we transform the momenta by

$$\begin{aligned} U &= (X - iY)/(2b), \\ V &= (X + iY)/(2b), \end{aligned}$$

and also scale the remaining variables z and Z by $1/b$. In the function Ω we encounter the ratio b/a'. We therefore define one of our parameters by

$$\alpha = b/a'.$$

We still have the freedom to choose b arbitrarily. We select it such that the coefficient of $1/r$ in H_M is one, that is

$$b = (1+m)^{2/3}a.$$

We introduce a new independent variable by

$$\zeta = e^{i\tau}. \tag{4}$$

It gives rise to the differential operator $D = \zeta(\mathrm{d}/\mathrm{d}\zeta)$, and it converts Fourier series into powers in ζ. With all these changes the Hamiltonian for the Moon reads

$$H_M = 2UV + \tfrac{1}{2}Z^2 + m(vV - uU) + (1/r) + \Omega, \tag{5a}$$

with

$$\Omega = (1-q)m^2 \sum_{k=2} c_k \alpha^{k-2} \left(\frac{a'}{r}\right)^{k+1} r^k P_k(\cos\gamma). \tag{5b}$$

The equations of motion are

$$Du = \partial H/\partial U, \qquad DU = -\partial H/\partial u$$

$$Dz = \partial H/\partial Z, \qquad DZ = -\partial H/\partial z.$$

As $v = \bar{u}$ and $V = \bar{U}$ the corresponding equations are not written down. Incidentally, as a special case we obtain Hill's lunar problem by setting $r' = a'$ and by using only the term for $k = 2$ in Equation (5b) – that is

$$\Omega = m^2(1-q)(\tfrac{3}{8}(u+v)^2 - \tfrac{1}{2}r^2).$$

It should be noted that this form is slightly different from the usual Hill's problem as we did not set $q = 0$. Also our definition of α is different from the one used by Brown. The two parameters differ by a factor close to unity. Brown's definition of α is more involved. It insures that a certain coefficient in the solution is exactly one. This may be of advantage when the computations are done by hand, but it is irrelevant when the computations are done by machine.

For our computations m, q and the ratio E/M are assigned their correct numerical value from the outset. Brown did the same with the parameter m, because the series converge very slowly when m is kept as a formal paramenter. On the other hand he had chosen the value $q = 0$ and had used an approach which allows him to substitute the value for E/M after the semianalytical solution is completed. This requires additional corrections later on. We will avoid this unwieldly backtracking by solving the main problem of lunar theory as given by Equations (5).

3. The Solution in Cartesian Coordinates

In another paper (Schmidt, 1980a) we describe how we have adapted the method of Brown to solve formally by machine the equations of motion for the Moon. For the discussion here it suffices to describe the form of the solution in Cartesian coordinates.

The solution will depend on four formal parameters. Two of them depend directly on the orbital parameters of the Sun. They are the eccentricity e' and the ratio $\alpha = b/a'$. The other parameters are e and k. They are a measure for the eccentricity for the Moon's orbit and for the inclination over the ecliptic.

In complex coordinates and in terms of Delaunay's elements the solution is of the form

$$u, iz = \sum A_\nu \exp i(\nu_1 l + \nu_2 l' + \nu_3 F + \nu_4 D).$$

Summation is over the integer quadruples $\nu = (\nu_1, \nu_2, \nu_3, \nu_4)$. The coefficients A_ν are power series in the four variables e, e', k and α.

We will use Delaunay's elements in the following way

$$l = c(n-n')(t-t_1),$$

$$l' = m(n-n')(t-t_2) = n'(t-t_2),$$

$$F = g(n-n')(t-t_3),$$

$$D = \tau = (n-n')(t-t_0).$$

The factors c and g determine then the mean motions of the perigee and node. They are power series in e^2, e'^2, k^2 and α^2. The coefficients of these power series have to be found along with the coefficients for the terms in A_ν. If we also take Equation (4) into account, then we can write the solution in the form

$$u\zeta^{-1}, iz = \sum A_{\lambda\nu} e^{\lambda_1} e'^{\lambda_2} k^{\lambda_3} \alpha^{\lambda_4} \zeta^{\nu_1 c + \nu_2 m + \nu_3 g + \nu_4}.$$

Summation is over all nonnegative integers $\lambda_1, \ldots, \lambda_4$ and all integers $\nu_1, \ldots, \nu_4$. Due to the d'Alembert characteristics certain coefficients $A_{\lambda\nu}$ have to be zero. Since our computer program generates automatically only those terms which have a chance of being nonzero and stores only those terms that are above a certain threshold in absolute value we do not have to specify here explicitly which terms will occur. Of importance to us is that for any given quadruple λ the following restrictions can be put on the summation: $|\nu_j| \leqslant \lambda_j$, $j = 1, 2, 3$ and ν_4 varies over all odd or all even integers. As the absolute values of the coefficients decrease rapidly as $|\nu_4|$ increases it is permitted to work with truncated series.

Brown calls the quadruple $\lambda = (\lambda_1, \lambda_2, \lambda_3, \lambda_4)$ the characteristic of a term. The order of a term is $|\lambda| = \lambda_1 + \lambda_2 + \lambda_3 + \lambda_4$. We have computed terms through ninth order. However, as the numerical value of α is a magnitude smaller than those of the other parameters we have omitted all terms which contain α^5. The size of the series increases exponentially with the order. To keep the series manageable and to anticipate the propagation of truncation and roundoff errors from one order to the next we have increased our threshold with the order. For the results listed below we have used the threshold $\delta = 10^{-17+1.5 \times |\lambda|}$.

We have also used smaller thresholds. Lowering the threshold below δ did not influence the final result, but it increased the computing time as larger series had to be manipulated.

The solution in Cartesian coordinates can be listed in the form

$$u\zeta^{-1} = \overline{v}\zeta = u_0 + \sum u_\mu, \qquad iz = \sum z_\mu. \tag{6}$$

The series u_μ and z_μ contain all terms of order μ and the summation starts with $\mu = 1$.

4. Results in Spherical Coordinates

The position of the Moon is traditionally given by its longitude, latitude and its sine parallax. We follow this convention here so that comparisons with other theories are possible. For practical purposes it would be better to give the radial distance instead of the sine parallax. We compromise somewhat as we list the reciprocal of the distance, that is the parallax $1/r$ multiplied by $648\,000/\pi$ seconds. It serves as a good approximation to the sine parallax although at the accuracy we aim for one should add the correction $-r^{-3}/6$ to what we call the parallax to obtain the conventional sine parallax.

The longitude V is measured in the x–y plane from a fixed axis. The function $V-nt$ can be expressed as a Fourier series and we write

$$V = nt + \epsilon + V_0 + \sum_{\mu=1} V_\mu$$

where V_μ ($\mu = 0, 1, \ldots$) groups the periodic terms of order μ. On the other hand we have with Equation (3)

$$\arg(u) = V - n't - \epsilon' = V - nt - \epsilon + \tau$$

so that

$$\arg(u\zeta^{-1}) = V_0 + \sum V_\mu.$$

Using the form (6) for u we compute V_0 from

$$V_0 = \operatorname{Im}(\log u_0).$$

We had computed the intermediate orbit ζu_0 with m as a formal parameter previously, see Schmidt (1979). As $u_0 = 1 - 2m/3 + \ldots$ we can utilize the following lemma to find the expansion for the natural logarithm of u_0. The role of the small parameter will be played by m. It will be replaced by its numerical value after the expansion has been accomplished.

LEMMA. *Let* $x = 1 + \Sigma x_n \epsilon^n$. *The terms of the series* $y = \Sigma y_n \epsilon^n$ *which satisfies formally* $y = \log x$ *can be found recursively from*

$$y_n = x_n - \frac{1}{n} \sum_{k=1}^{n-1} k x_{n-k} y_k, \quad n = 1, 2, \ldots.$$

Proof. Use $x\, \mathrm{d}y/\mathrm{d}\epsilon = \mathrm{d}x/\mathrm{d}\epsilon$.

The terms of order μ in longitude are found by applying the above lemma to

$$V = \operatorname{Im}\left(\log\left(1 + \sum (u_\mu/u_0)\right)\right).$$

The series u_μ/u_0, $\mu = 1, 2, \ldots$ were used previously and are therefore available. The same

holds for the series making up r^2 and the parallax can be computed directly by calling a subroutine of our algebraic processor.

The latitude, given by $\Phi = \Sigma \Phi_\mu$, is computed recursively with respect to the order from $\sin \Phi = z/r$ by the following method.

LEMMA. *Given is* $S = \sin \Phi = \Sigma s_n \epsilon^n$. *To find* $\Phi = \Sigma \phi_n \epsilon^n$ *introduce* $C = \cos \Phi = 1 + \Sigma c_n \epsilon^n$ *and determine the coefficients recursively from*

$$\phi_n = s_n - \frac{1}{n} \sum_{k=1}^{n-1} k \phi_k c_{n-k}, \qquad n = 1, 2, \ldots$$

$$c_n = -\frac{1}{n} \sum_{k=1}^{n-1} k \phi_k s_{n-k}.$$

Proof. Use $\mathrm{d}S/\mathrm{d}\epsilon = C\, \mathrm{d}\Phi/\mathrm{d}\epsilon$ and $\mathrm{d}C/\mathrm{d}\epsilon = -S\, \mathrm{d}\Phi/\mathrm{d}\epsilon$.

The value of the parameter α is determined from $\alpha = (b/a)(a/a') = m^{2/3} q^{1/3}$. Observations give e' and the coefficients of $\sin l$ in longitude and of $\sin F$ in latitude. These two principal terms in our theory are power series in the four parameters. This gives rise to two simultaneous nonlinear equations for e and k. They are solved easily by iteration. The numerical value for b is determined such that the constant term in the parallax is equal to a standard value derived from observations. The only thing left is to evaluate the series with these values for the parameters.

5. Description of Tables

We have compared our solution to the main problem directly or indirectly to several other solutions which have been computed recently. They are the theories of Deprit *et al.* (1971), of Henrard (1979), of Eckert as completed by Gutzwiller (1979) and of Chapront-Touzé (1979). We report on these comparisons in a separate paper (Schmidt, 1980b). As all of these theories were computed independently of each other and by different methods, we feel confident that these comparisons justify our claim to an accuracy of $0.000\,01''$ for the terms in longitude and latitude and of $0.000\,001''$ for the terms in the parallax.

The constants in our theory are given for epoch 1900. The values for the mass ratios are those recommended by the I.A.U. in 1976. The following constants were therefore used for the solution listed in the Table:

n = mean motion of Moon = $1\,732\,559\,353.56''$/century,

n' = mean motion of Sun = $129\,597\,742.38''$/century,

principal term in longitude = $22\,639.55''$,

principal term in latitude = $18\,461.40''$,

constant term in parallax $= 3\,422.452''$,

e' = eccentricity of Sun $= 0.016\,751\,04$,

$q = (E+M)/(E+M+S) = 3.040\,423\,956 \times 10^{-6}$,

$E/M = 81.300\,68$.

The tables give the multiples of the four angles for the sines in longitude and latitude and for the cosines in the parallax. The tables have been written by the computer to avoid any error in transcribing the data.

The mean motion of the perigee and of the node are determined from

$$\Pi = n - (n - n') \times c \quad \text{and} \quad \Omega = n - (n - n') \times g.$$

When the power series for c and g are evaluated at the values of the parameters e, e', k and we find that

$\Pi = 14\,642\,614.401''$ per Julian century,

$\Omega = -6\,967\,180.358''$ per Julian century.

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The author is indebted to A. Deprit. Many ideas which were incorporated into the computer program were his. In particular our algebraic processor POLYPAK for the manipulation of real or complex power series in several real or complex variables is based on lectures he had given at the University of Cincinnati.

All computer programs are written for the PL/I optimizing compiler version 3.0 of IBM. All computations were performed on the Amdahl 470-V6 of the University of Cincinnati. The machine was running at that time under the IBM operating system VS2 release 1.7. A solution including all sixth-order terms requires about twelve minutes. The computer time and the requirement for secondary storage double at least with each additional order.

The computer program is kept operational so that the computations can be repeated for any other set of parameters. The program and copies of the series are available from the author on request.

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TABLE I

Coefficients of sine in longitude and latitude and of cosine in parallax

l	l	F	D	Longitude	Parallax	l	l′	F	D	Latitude
0	0	0	0		3422.452000	0	0	1	0	18461.40000
0	0	0	1	-124.98817	-.976465	0	0	1	1	-5.36844
0	0	0	2	2369.90156	28.231762	0	0	1	2	117.26108
0	0	0	3	.40428	.002314	0	0	1	3	-.02839
0	0	0	4	13.89881	.260968	0	0	1	4	1.19186
0	0	0	5	.00439	.000043	0	0	1	5	-.00027
0	0	0	6	.12616	.003080	0	0	1	6	.01465
0	0	0	7	.00005	.000001	0	0	1	8	.00020
0	0	0	8	.00139	.000041	0	0	1	-10	-.00001
0	0	0	10	.00002	.000001	0	0	1	-8	-.00045
0	0	2	0	-411.60285	-.012166	0	0	1	-7	.00003
0	0	2	1	.25429	.000265	0	0	1	-6	-.03674
0	0	2	2	-5.74167	-.001183	0	0	1	-5	.00254
0	0	2	3	.00375	.000005	0	0	1	-4	-3.67442
0	0	2	4	-.08500	-.000029	0	0	1	-3	.35182
0	0	2	5	.00006		0	0	1	-2	-623.65488
0	0	2	6	-.00132	-.000001	0	0	1	-1	4.80578
0	0	2	8	-.00002		0	0	3	0	-6.29664
0	0	2	-8	.00004	.000001	0	0	3	1	.00645
0	0	2	-7	.00001		0	0	3	2	-.14453
0	0	2	-6	.00214	.000046	0	0	3	3	.00016
0	0	2	-5	.00137	-.000030	0	0	3	4	-.00288
0	0	2	-4	.02391	.003280	0	0	3	6	-.00005
0	0	2	-3	.25304	-.001699	0	0	3	-8	-.00001
0	0	2	-2	-55.17772	-.105283	0	0	3	-7	.00001
0	0	2	-1	.58332	.007100	0	0	3	-6	-.00060
0	0	4	0	.42034	.000001	0	0	3	-5	.00041
0	0	4	1	-.00054		0	0	3	-4	-.06256
0	0	4	2	.01372		0	0	3	-3	.01009
0	0	4	3	-.00002		0	0	3	-2	-2.18635
0	0	4	4	.00034		0	0	3	-1	.03226
0	0	4	6	.00001		0	0	5	0	.00592
0	0	4	-6	.00008		0	0	5	1	-.00001
0	0	4	-5	.00002		0	0	5	2	.00026
0	0	4	-4	.00003	.000002	0	0	5	4	.00001
0	0	4	-3	-.00025	.000001	0	0	5	-4	.00013
0	0	4	-2	.07518	.000093	0	0	5	-3	-.00001
0	0	4	-1	-.00123		0	0	5	-2	.00221
0	0	6	0	-.00058		0	0	5	-1	-.00003
0	0	6	2	-.00003		0	0	7	0	-.00001
0	0	6	-4	-.00001		0	1	1	0	-6.47650
0	0	6	-2	-.00015		0	1	1	1	.80464
0	1	0	0	-668.10917	-.399797	0	1	1	2	-1.26749
0	1	0	1	18.00003	.149228	0	1	1	3	.01354
0	1	0	2	-24.42003	-.300300	0	1	1	4	-.02556
0	1	0	3	.15028	.002520	0	1	1	5	.00023
0	1	0	4	-.28983	-.005567	0	1	1	6	-.00047
0	1	0	5	.00182	.000042	0	1	1	8	-.00001
0	1	0	6	-.00397	-.000099	0	1	1	-8	-.00011
0	1	0	7	.00003	.000001	0	1	1	-7	.00001
0	1	0	8	-.00006	-.000002	0	1	1	-6	-.00653
0	1	0	-10	-.00001		0	1	1	-5	.00032
0	1	0	-8	-.00037	.000011	0	1	1	-4	-.41599
0	1	0	-7	-.00002		0	1	1	-3	.02578
0	1	0	-6	-.02516	.000607	0	1	1	-2	-29.65182

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
0	1	0	-5	-.00103	.000014	0	1	1	-1	.01349
0	1	0	-4	-1.87549	.034665	0	1	3	0	.01160
0	1	0	-3	-.06523	.000653	0	1	3	1	-.00083
0	1	0	-2	-165.14607	1.916589	0	1	3	2	.00178
0	1	0	-1	.55835	-.003745	0	1	3	3	-.00003
0	1	2	0	.41445	.001379	0	1	3	4	.00007
0	1	2	1	-.03596	-.000004	0	1	3	-6	-.00010
0	1	2	2	.06557	.000036	0	1	3	-5	.00005
0	1	2	3	-.00096		0	1	3	-4	-.00535
0	1	2	4	.00187	.000001	0	1	3	-3	.00076
0	1	2	5	-.00002		0	1	3	-2	-.08837
0	1	2	6	.00004		0	1	3	-1	.00052
0	1	2	-8	.00001		0	1	5	0	-.00001
0	1	2	-6	.00025	.000008	0	1	5	-4	.00001
0	1	2	-5	.00021	-.000004	0	1	5	-2	.00009
0	1	2	-4	-.00668	.000365	0	1	-5	2	.00005
0	1	2	-3	.01952	-.000121	0	1	-5	4	.00001
0	1	2	-2	-2.15155	-.006446	0	1	-5	-2	-.00002
0	1	2	-1	.01284	.000117	0	1	-3	0	.00010
0	1	4	0	-.00083		0	1	-3	1	.00081
0	1	4	1	.00007		0	1	-3	2	-.05471
0	1	4	2	-.00017		0	1	-3	3	.00031
0	1	4	4	-.00001		0	1	-3	4	-.00304
0	1	4	-6	.00001		0	1	-3	5	.00003
0	1	4	-4	.00001		0	1	-3	6	-.00004
0	1	4	-3	-.00002		0	1	-3	-6	.00001
0	1	4	-2	.00287	.000004	0	1	-3	-4	.00037
0	1	4	-1	-.00002		0	1	-3	-3	-.00001
0	1	6	-2	-.00001		0	1	-3	-2	.00946
0	1	-4	0	-.00023		0	1	-3	-1	-.00006
0	1	-4	2	.00198	-.000001	0	1	-1	0	-4.85191
0	1	-4	3	-.00001		0	1	-1	1	.80627
0	1	-4	4	-.00001		0	1	-1	2	-12.12496
0	1	-4	6	.00001		0	1	-1	3	.03444
0	1	-4	-4	-.00004		0	1	-1	4	-.11336
0	1	-4	-2	-.00089		0	1	-1	5	.00051
0	1	-2	0	.07520	.001465	0	1	-1	6	-.00154
0	1	-2	1	.00017	-.000302	0	1	-1	7	.00001
0	1	-2	2	-1.44084	.001367	0	1	-1	8	-.00002
0	1	-2	3	.00893	.000064	0	1	-1	-8	-.00005
0	1	-2	4	.00052	-.000154	0	1	-1	-6	-.00289
0	1	-2	5	.00005	.000002	0	1	-1	-5	.00001
0	1	-2	6	.00008	-.000003	0	1	-1	-4	-.15830
0	1	-2	-8	.00001		0	1	-1	-3	.00043
0	1	-2	-6	.00026		0	1	-1	-2	-7.97879
0	1	-2	-5	-.00001		0	1	-1	-1	.01833
0	1	-2	-4	.01116	-.000004	0	2	1	0	-.05758
0	1	-2	-3	-.00020		0	2	1	1	-.00205
0	1	-2	-2	.38310	-.000060	0	2	1	2	-.01489
0	1	-2	-1	-.00155	.000008	0	2	1	3	-.00016
0	2	0	0	-7.48534	-.008646	0	2	1	4	-.00025
0	2	0	1	-.03988	-.000346	0	2	1	5	-.00001
0	2	0	2	-.18669	-.002545	0	2	1	-8	-.00001
0	2	0	3	-.00192	-.000032	0	2	1	-6	-.00067
0	2	0	4	-.00209	-.000043	0	2	1	-5	.00002

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
0	2	0	5	-.00004	-.000001	0	2	1	-4	-.02913
0	2	0	6	-.00002		0	2	1	-3	.00131
0	2	0	-8	-.00005	.000002	0	2	1	-2	-1.09131
0	2	0	-6	-.00286	.000068	0	2	1	-1	-.00205
0	2	0	-5	-.00012	.000002	0	2	3	0	.00016
0	2	0	-4	-.15303	.002789	0	2	3	2	.00003
0	2	0	-3	-.00520	.000059	0	2	3	-6	-.00001
0	2	0	-2	-8.09106	.091643	0	2	3	-4	-.00029
0	2	0	-1	-.04326	.000316	0	2	3	-3	.00004
0	2	2	0	.00522	.000029	0	2	3	-2	-.00275
0	2	2	1	.00011		0	2	3	-1	.00001
0	2	2	2	.00096		0	2	-3	0	-.00015
0	2	2	3	.00001		0	2	-3	2	-.00104
0	2	2	4	.00002		0	2	-3	4	-.00001
0	2	2	-6	.00002	.000001	0	2	-3	-4	.00003
0	2	2	-5	.00002		0	2	-3	-2	.00044
0	2	2	-4	-.00091	.000025	0	2	-1	0	-.01810
0	2	2	-3	.00103	-.000006	0	2	-1	1	-.00171
0	2	2	-2	-.06345	-.000273	0	2	-1	2	-.13482
0	2	2	-1	.00032	.000002	0	2	-1	3	-.00056
0	2	4	0	-.00001		0	2	-1	4	-.00056
0	2	4	-2	.00008		0	2	-1	5	-.00001
0	2	-4	0	.00001		0	2	-1	-8	-.00001
0	2	-4	2	.00004		0	2	-1	-6	-.00033
0	2	-4	-2	-.00004		0	2	-1	-4	-.01277
0	2	-2	0	-.00356	.000046	0	2	-1	-3	-.00008
0	2	-2	1	.00003		0	2	-1	-2	-.38545
0	2	-2	2	-.02356	.000002	0	2	-1	-1	-.00215
0	2	-2	3	-.00009	-.000001	0	3	1	0	-.00031
0	2	-2	4	.00001		0	3	1	1	-.00003
0	2	-2	-6	.00003		0	3	1	2	.00004
0	2	-2	-4	.00089		0	3	1	4	.00001
0	2	-2	-2	.01825	-.000002	0	3	1	-6	-.00005
0	2	-2	-1	.00007		0	3	1	-4	-.00163
0	3	0	0	-.10213	-.000165	0	3	1	-3	.00006
0	3	0	1	-.00056	-.000005	0	3	1	-2	-.03674
0	3	0	2	.00039	.000006	0	3	1	-1	-.00011
0	3	0	3	-.00002		0	3	3	-4	-.00001
0	3	0	4	.00005	.000001	0	3	3	-2	-.00008
0	3	0	-8	-.00001		0	3	-3	0	-.00001
0	3	0	-6	-.00024	.000006	0	3	-3	-2	.00002
0	3	0	-5	-.00001		0	3	-1	0	.00066
0	3	0	-4	-.00979	.000176	0	3	-1	1	-.00003
0	3	0	-3	-.00031	.000004	0	3	-1	2	.00037
0	3	0	-2	-.34239	.003784	0	3	-1	3	-.00001
0	3	0	-1	-.00256	.000017	0	3	-1	4	.00002
0	3	2	0	.00007	.000001	0	3	-1	-6	-.00003
0	3	2	-4	-.00007	.000001	0	3	-1	-4	-.00081
0	3	2	-3	.00005		0	3	-1	-3	-.00001
0	3	2	-2	-.00164	-.000010	0	3	-1	-2	-.01615
0	3	2	-1	.00001		0	3	-1	-1	-.00012
0	3	-2	0	-.00016	.000001	0	4	1	0	.00001
0	3	-2	2	.00007		0	4	1	-4	-.00008
0	3	-2	3	-.00001		0	4	1	-2	-.00119
0	3	-2	-4	.00006		0	4	-1	0	.00004

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
0	3	-2	-2	.00076		0	4	-1	-4	-.00004
0	4	0	0	-.00129	-.000002	0	4	-1	-2	-.00063
0	4	0	1	-.00001		0	5	1	-2	-.00004
0	4	0	2	.00001		0	5	-1	-2	-.00002
0	4	0	-6	-.00002		1	0	1	0	1010.17427
0	4	0	-4	-.00054	.000010	1	0	1	1	-.66741
0	4	0	-3	-.00002		1	0	1	2	15.12155
0	4	0	-2	-.01344	.000145	1	0	1	3	-.00658
0	4	0	-1	-.00011	.000001	1	0	1	4	.21259
0	4	2	-2	-.00004		1	0	1	5	-.00006
0	4	-2	0	-.00001		1	0	1	6	.00305
0	4	-2	-2	.00003		1	0	1	8	.00004
0	5	0	0	-.00001		1	0	1	-10	-.00002
0	5	0	-4	-.00003		1	0	1	-8	-.00130
0	5	0	-2	-.00051	.000005	1	0	1	-7	.00013
0	6	0	-2	-.00002		1	0	1	-6	-.09403
1	0	0	0	22639.55000	186.526224	1	0	1	-5	.01048
1	0	0	1	-8.45305	-.109313	1	0	1	-4	-6.57954
1	0	0	2	191.95449	3.085663	1	0	1	-3	.30516
1	0	0	3	.00038	-.000439	1	0	1	-2	-166.57502
1	0	0	4	1.97768	.043562	1	0	1	-1	.42989
1	0	0	5	.00050	.000003	1	0	3	0	-1.01941
1	0	0	6	.02284	.000621	1	0	3	1	.00142
1	0	0	7	.00001		1	0	3	2	-.03038
1	0	0	8	.00029	.000009	1	0	3	3	.00004
1	0	0	-10	-.00006	.000002	1	0	3	4	-.00068
1	0	0	-8	-.00455	.000122	1	0	3	6	-.00001
1	0	0	-7	.00005	-.000003	1	0	3	-8	-.00002
1	0	0	-6	-.39450	.008553	1	0	3	-7	.00001
1	0	0	-5	.01349	-.000336	1	0	3	-6	-.00107
1	0	0	-4	-38.42933	.600671	1	0	3	-5	.00011
1	0	0	-3	3.20961	-.038213	1	0	3	-4	.00554
1	0	0	-2	-4586.42256	34.309051	1	0	3	-3	.00128
1	0	0	-1	18.58472	.011702	1	0	3	-2	-.32908
1	0	2	0	-45.10031	-.001002	1	0	3	-1	.00369
1	0	2	1	.04450	.000038	1	0	5	0	.00156
1	0	2	2	-.99023	-.000109	1	0	5	2	.00007
1	0	2	3	.00083	.000001	1	0	5	-4	.00004
1	0	2	4	-.01781	-.000004	1	0	5	-2	.00046
1	0	2	5	.00001		1	0	5	-1	-.00001
1	0	2	6	-.00031		1	0	-5	0	-.00235
1	0	2	8	-.00001		1	0	-5	1	.00001
1	0	2	-8	.00005	.000002	1	0	-5	2	-.00075
1	0	2	-7	.00004	-.000001	1	0	-5	4	.00001
1	0	2	-6	-.00007	.000108	1	0	-5	-4	-.00002
1	0	2	-5	.00334	-.000041	1	0	-5	-2	-.00038
1	0	2	-4	-.30085	.001445	1	0	-3	0	2.79871
1	0	2	-3	.02979	.000079	1	0	-3	1	-.00019
1	0	2	-2	-.17903	-.083241	1	0	-3	2	-.29115
1	0	2	-1	.02379	.000788	1	0	-3	3	.00002
1	0	4	0	.09092		1	0	-3	4	-.00552
1	0	4	1	-.00015		1	0	-3	5	-.00003
1	0	4	2	.00344		1	0	-3	6	-.00005
1	0	4	3	-.00001		1	0	-3	-6	.00014
1	0	4	4	.00009		1	0	-3	-5	-.00001

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
1	0	4	-4	-.00017	.000010	1	0	-3	-4	.00664
1	0	4	-3	-.00006		1	0	-3	-3	-.00038
1	0	4	-2	.00850	.000009	1	0	-3	-2	.24484
1	0	4	-1	-.00019		1	0	-3	-1	-.00234
1	0	6	0	-.00019		1	0	-1	0	999.70075
1	0	6	2	-.00001		1	0	-1	1	-.58893
1	0	6	-2	-.00003		1	0	-1	2	33.35721
1	0	-6	0	.00016		1	0	-1	3	-.03611
1	0	-6	2	.00001		1	0	-1	4	.47337
1	0	-6	-2	.00004		1	0	-1	5	-.00045
1	0	-4	0	-.08019	.000004	1	0	-1	6	.00654
1	0	-4	1	.00011	-.000003	1	0	-1	7	-.00001
1	0	-4	2	.00056	.000190	1	0	-1	8	.00009
1	0	-4	3	.00005		1	0	-1	-10	-.00001
1	0	-4	4	-.00061	-.000003	1	0	-1	-8	-.00060
1	0	-4	6	-.00001		1	0	-1	-7	.00003
1	0	-4	-6	-.00002		1	0	-1	-6	-.04217
1	0	-4	-4	-.00072		1	0	-1	-5	.00245
1	0	-4	-3	.00004		1	0	-1	-4	-2.99847
1	0	-4	-2	-.01993		1	0	-1	-3	.20593
1	0	-4	-1	.00011		1	0	-1	-2	-199.48479
1	0	-2	0	39.53384	-.708084	1	0	-1	-1	-.13928
1	0	-2	1	-.04012	.000043	1	1	1	0	-5.32482
1	0	-2	2	-6.38320	-.047869	1	1	1	1	.10202
1	0	-2	3	-.01062	-.000139	1	1	1	2	-.23761
1	0	-2	4	-.06600	-.000435	1	1	1	3	.00258
1	0	-2	5	-.00019	-.000005	1	1	1	4	-.00559
1	0	-2	6	-.00094	-.000002	1	1	1	5	.00005
1	0	-2	8	-.00001		1	1	1	6	-.00011
1	0	-2	-8	.00006		1	1	1	-10	-.00001
1	0	-2	-6	.00359	-.000003	1	1	1	-8	-.00029
1	0	-2	-5	-.00024		1	1	1	-7	.00002
1	0	-2	-4	.20133	-.000180	1	1	1	-6	-.01490
1	0	-2	-3	-.01215	.000008	1	1	1	-5	.00128
1	0	-2	-2	9.36599	-.011477	1	1	1	-4	-.59728
1	0	-2	-1	-.01598	.000500	1	1	1	-3	.02109
1	1	0	0	-109.65823	-.949089	1	1	1	-2	-7.45347
1	1	0	1	1.26502	.016760	1	1	1	-1	-.01034
1	1	0	2	-2.92193	-.048095	1	1	3	0	.00670
1	1	0	3	.02250	.000456	1	1	3	1	-.00020
1	1	0	4	-.05083	-.001143	1	1	3	2	.00052
1	1	0	5	.00035	.000009	1	1	3	3	-.00001
1	1	0	6	-.00083	-.000023	1	1	3	4	.00002
1	1	0	7	.00001		1	1	3	-6	-.00014
1	1	0	8	-.00001		1	1	3	-5	.00001
1	1	0	-10	-.00002	.000001	1	1	3	-4	.00066
1	1	0	-8	-.00113	.000030	1	1	3	-3	.00009
1	1	0	-6	-.07160	.001533	1	1	3	-2	-.01037
1	1	0	-5	.00155	-.000039	1	1	3	-1	.00003
1	1	0	-4	-4.38507	.067293	1	1	5	0	-.00001
1	1	0	-3	.23199	-.002658	1	1	5	-2	.00001
1	1	0	-2	-205.95665	1.443505	1	1	-5	2	.00002
1	1	0	-1	.13671	.000128	1	1	-5	-2	-.00002
1	1	2	0	.26404	.000122	1	1	-3	0	-.00705
1	1	2	1	-.00661	-.000001	1	1	-3	1	-.00021

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
1	1	2	2	.01609	.000005	1	1	-3	2	.00466
1	1	2	3	-.00022		1	1	-3	4	.00011
1	1	2	4	.00048		1	1	-3	-6	.00003
1	1	2	5	-.00001		1	1	-3	-4	.00075
1	1	2	6	.00001		1	1	-3	-3	-.00002
1	1	2	-8	.00001	.000001	1	1	-3	-2	.01180
1	1	2	-7	.00001		1	1	-3	-1	-.00001
1	1	2	-6	-.00018	.000016	1	1	-1	0	-5.08886
1	1	2	-5	.00041	-.000005	1	1	-1	1	.03474
1	1	2	-4	-.02295	.000093	1	1	-1	2	-.82481
1	1	2	-3	.00189	.000007	1	1	-1	3	.00428
1	1	2	-2	.06118	-.003165	1	1	-1	4	-.01696
1	1	2	-1	.00101	.000003	1	1	-1	5	.00010
1	1	4	0	-.00062		1	1	-1	6	-.00031
1	1	4	1	.00002		1	1	-1	8	-.00001
1	1	4	2	-.00006		1	1	-1	-8	-.00015
1	1	4	-4	-.00002	.000001	1	1	-1	-6	-.00759
1	1	4	-2	.00015		1	1	-1	-5	.00029
1	1	-4	0	.00011		1	1	-1	-4	-.33966
1	1	-4	1	.00001		1	1	-1	-3	.01359
1	1	-4	2	.00003	-.000004	1	1	-1	-2	-8.89070
1	1	-4	4	.00004		1	1	-1	-1	-.00080
1	1	-4	-4	-.00008		1	2	1	0	-.05532
1	1	-4	-2	-.00093		1	2	1	1	-.00072
1	1	-2	0	-.08303	.002328	1	2	1	2	-.00146
1	1	-2	1	-.00157		1	2	1	3	-.00004
1	1	-2	2	.08493	.000676	1	2	1	4	-.00002
1	1	-2	3	.00020	.000003	1	2	1	-8	-.00004
1	1	-2	4	.00184		1	2	1	-6	-.00138
1	1	-2	6	.00004		1	2	1	-5	.00010
1	1	-2	-8	.00001		1	2	1	-4	-.03480
1	1	-2	-6	.00065	-.000001	1	2	1	-3	.00101
1	1	-2	-5	-.00003		1	2	1	-2	-.27000
1	1	-2	-4	.02279	-.000022	1	2	1	-1	-.00065
1	1	-2	-3	-.00076		1	2	3	0	.00007
1	1	-2	-2	.42731	-.000711	1	2	3	-6	-.00001
1	1	-2	-1	-.00013	-.000001	1	2	3	-4	.00005
1	2	0	0	-1.16759	-.010550	1	2	3	-2	-.00024
1	2	0	1	-.00853	-.000115	1	2	-3	0	-.00007
1	2	0	2	-.01350	-.000240	1	2	-3	2	-.00006
1	2	0	3	-.00039	-.000008	1	2	-3	-4	.00005
1	2	0	4	-.00008	-.000002	1	2	-3	-2	.00045
1	2	0	5	-.00001		1	2	-1	0	-.06218
1	2	0	-8	-.00016	.000004	1	2	-1	1	-.00022
1	2	0	-6	-.00748	.000158	1	2	-1	2	-.00621
1	2	0	-5	.00011	-.000003	1	2	-1	3	-.00009
1	2	0	-4	-.31029	.004678	1	2	-1	4	-.00001
1	2	0	-3	.01188	-.000131	1	2	-1	-8	-.00002
1	2	0	-2	-7.40864	.048181	1	2	-1	-6	-.00079
1	2	0	-1	-.00230	-.000008	1	2	-1	-5	.00002
1	2	2	0	.00271	.000002	1	2	-1	-4	-.02392
1	2	2	1	.00005		1	2	-1	-3	.00064
1	2	2	2	.00012		1	2	-1	-2	-.31632
1	2	2	-6	-.00003	.000001	1	2	-1	-1	.00001
1	2	2	-5	.00003		1	3	1	0	-.00084

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
1	2	2	-4	-.00108	.000003	1	3	1	1	-.00001
1	2	2	-3	.00008		1	3	1	2	.00001
1	2	2	-2	.00436	-.000096	1	3	1	-6	-.00010
1	2	2	-1	.00004		1	3	1	-5	.00001
1	2	4	0	-.00001		1	3	1	-4	-.00166
1	2	-4	-4	-.00001		1	3	1	-3	.00004
1	2	-4	-2	-.00003		1	3	1	-2	-.00921
1	2	-2	0	-.00040	.000023	1	3	1	-1	-.00003
1	2	-2	1	.00002		1	3	-3	-2	.00002
1	2	-2	2	-.00201	-.000016	1	3	-1	0	-.00109
1	2	-2	4	-.00002		1	3	-1	2	.00006
1	2	-2	-6	.00007		1	3	-1	-6	-.00006
1	2	-2	-4	.00160	-.000002	1	3	-1	-4	-.00135
1	2	-2	-3	-.00003		1	3	-1	-3	.00003
1	2	-2	-2	.01549	-.000032	1	3	-1	-2	-.01049
1	3	0	0	-.01810	-.000170	1	4	1	0	-.00001
1	3	0	1	-.00009	-.000001	1	4	1	-6	-.00001
1	3	0	2	.00004	.000001	1	4	1	-4	-.00007
1	3	0	4	.00001		1	4	1	-2	-.00031
1	3	0	-8	-.00002		1	4	-1	0	-.00002
1	3	0	-6	-.00059	.000012	1	4	-1	-4	-.00007
1	3	0	-5	.00001		1	4	-1	-2	-.00034
1	3	0	-4	-.01754	.000260	1	5	1	-2	-.00001
1	3	0	-3	.00053	-.000006	1	5	-1	-2	-.00001
1	3	0	-2	-.24883	.001484	1	-4	1	0	.00004
1	3	0	-1	-.00020	-.000001	1	-4	1	2	.00010
1	3	2	0	.00004		1	-4	1	4	.00001
1	3	2	-4	-.00004		1	-4	-1	0	.00004
1	3	2	-2	.00021	-.000003	1	-4	-1	2	.00008
1	3	-2	2	.00002		1	-4	-1	4	.00001
1	3	-2	-6	.00001		1	-3	1	0	.00218
1	3	-2	-4	.00009		1	-3	1	1	.00001
1	3	-2	-2	.00052	-.000001	1	-3	1	2	.00258
1	4	0	0	-.00032	-.000003	1	-3	1	4	.00017
1	4	0	-6	-.00004	.000001	1	-3	1	6	.00001
1	4	0	-4	-.00087	.000013	1	-3	1	-4	-.00008
1	4	0	-3	.00002		1	-3	1	-3	.00001
1	4	0	-2	-.00820	.000044	1	-3	1	-2	.00009
1	4	0	-1	-.00001		1	-3	-3	2	-.00003
1	4	2	-2	.00001		1	-3	-1	0	.00192
1	4	-2	-2	.00002		1	-3	-1	1	-.00002
1	5	0	0	-.00001		1	-3	-1	2	.00242
1	5	0	-4	-.00004	.000001	1	-3	-1	3	-.00001
1	5	0	-2	-.00027	.000001	1	-3	-1	4	.00024
1	6	0	-2	-.00001		1	-3	-1	6	.00001
1	-5	0	0	.00002		1	-3	-1	-4	-.00002
1	-5	0	2	.00005	.000001	1	-3	-1	-3	.00001
1	-4	0	0	.00109	.000007	1	-3	-1	-2	.00005
1	-4	0	2	.00134	.000020	1	-3	-1	-1	.00001
1	-4	0	4	.00009	.000002	1	-2	1	0	.11391
1	-4	0	-2	.00001		1	-2	1	1	.00005
1	-4	2	2	-.00001		1	-2	1	2	.05878
1	-4	-2	2	-.00002		1	-2	1	4	.00256
1	-3	0	0	.05181	.000356	1	-2	1	6	.00007
1	-3	0	1	.00007	.000001	1	-2	1	-6	.00005

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
1	-3	0	2	.03325	.000509	1	-2	1	-5	.00002
1	-3	0	3	.00003		1	-2	1	-4	.00440
1	-3	0	4	.00161	.000034	1	-2	1	-3	.00005
1	-3	0	6	.00005	.000001	1	-2	1	-2	.10588
1	-3	0	-6	-.00001		1	-2	1	-1	.00008
1	-3	0	-4	-.00023	.000004	1	-2	3	0	-.00010
1	-3	0	-3	.00014	-.000002	1	-2	3	2	-.00011
1	-3	0	-2	.00189	-.000016	1	-2	3	4	-.00001
1	-3	0	-1	.00012		1	-2	3	-4	-.00005
1	-3	2	0	-.00008		1	-2	3	-2	.00047
1	-3	2	2	-.00017		1	-2	-3	0	.00009
1	-3	2	4	-.00001		1	-2	-3	2	-.00073
1	-3	2	-3	-.00001		1	-2	-3	4	-.00004
1	-3	2	-2	.00003		1	-2	-3	-2	-.00012
1	-3	-2	0	-.00003	-.000001	1	-2	-1	0	.09558
1	-3	-2	2	-.00065	-.000004	1	-2	-1	1	-.00060
1	-3	-2	4	-.00003		1	-2	-1	2	.06949
1	-2	0	0	2.58101	.018969	1	-2	-1	3	-.00014
1	-2	0	1	-.00033	-.000002	1	-2	-1	4	.00419
1	-2	0	2	.75550	.011736	1	-2	-1	6	.00013
1	-2	0	3	.00038	.000005	1	-2	-1	-6	.00002
1	-2	0	4	.02423	.000521	1	-2	-1	-5	.00001
1	-2	0	5	.00002		1	-2	-1	-4	.00180
1	-2	0	6	.00057	.000015	1	-2	-1	-3	.00010
1	-2	0	8	.00001		1	-2	-1	-2	.11387
1	-2	0	-6	.00021	-.000005	1	-2	-1	-1	.00039
1	-2	0	-5	.00009	-.000002	1	-1	1	0	6.74860
1	-2	0	-4	.02182	-.000355	1	-1	1	1	-.00847
1	-2	0	-3	.00127	-.000016	1	-1	1	2	1.13749
1	-2	0	-2	2.53403	-.021108	1	-1	1	3	-.00030
1	-2	0	-1	.00301	-.000004	1	-1	1	4	.03016
1	-2	2	0	-.00476	.000004	1	-1	1	6	.00063
1	-2	2	2	-.00380		1	-1	1	8	.00001
1	-2	2	4	-.00021		1	-1	1	-8	.00006
1	-2	2	6	-.00001		1	-1	1	-7	-.00002
1	-2	2	-6	-.00001		1	-1	1	-6	.00350
1	-2	2	-4	-.00091	.000007	1	-1	1	-5	-.00097
1	-2	2	-3	.00001		1	-1	1	-4	.17234
1	-2	2	-2	.00657	.000096	1	-1	1	-3	-.01324
1	-2	2	-1	-.00001		1	-1	1	-2	.79302
1	-2	4	0	.00001		1	-1	1	-1	-.00637
1	-2	4	2	.00001		1	-1	3	0	-.00680
1	-2	4	-2	-.00002		1	-1	3	1	.00002
1	-2	-4	2	.00001		1	-1	3	2	-.00224
1	-2	-4	-2	.00001		1	-1	3	4	-.00009
1	-2	-2	0	-.00014	-.000038	1	-1	3	-6	.00007
1	-2	-2	1	-.00008		1	-1	3	-5	-.00001
1	-2	-2	2	-.01652	-.000108	1	-1	3	-4	.00015
1	-2	-2	3	-.00004	-.000001	1	-1	3	-3	-.00003
1	-2	-2	4	-.00052	-.000005	1	-1	3	-2	.00343
1	-2	-2	6	-.00002		1	-1	3	-1	-.00007
1	-2	-2	-4	-.00012		1	-1	5	0	.00001
1	-2	-2	-3	-.00001		1	-1	5	2	.00001
1	-2	-2	-2	-.00517	.000001	1	-1	5	-2	-.00001
1	-2	-2	-1	-.00001		1	-1	-5	2	-.00003

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
1	-1	0	0	147.69561	1.152752	1	-1	-3	0	.00913
1	-1	0	1	-.12103	-.001494	1	-1	-3	1	-.00008
1	-1	0	2	14.56707	.229943	1	-1	-3	2	-.01672
1	-1	0	3	.00331	.000022	1	-1	-3	4	-.00062
1	-1	0	4	.28322	.006156	1	-1	-3	6	-.00001
1	-1	0	5	.00014	.000002	1	-1	-3	-4	-.00012
1	-1	0	6	.00479	.000129	1	-1	-3	-3	.00005
1	-1	0	8	.00008	.000002	1	-1	-3	-2	-.00193
1	-1	0	-8	.00017	-.000005	1	-1	-3	-1	.00021
1	-1	0	-7	-.00007	.000002	1	-1	-1	0	5.64672
1	-1	0	-6	.01067	-.000236	1	-1	-1	1	-.02018
1	-1	0	-5	-.00476	.000094	1	-1	-1	2	1.77047
1	-1	0	-4	.63683	-.010192	1	-1	-1	3	-.00276
1	-1	0	-3	-.27446	.003464	1	-1	-1	4	.05701
1	-1	0	-2	28.46888	-.225758	1	-1	-1	5	-.00006
1	-1	0	-1	-1.08043	.000058	1	-1	-1	6	.00122
1	-1	2	0	-.30232	.000095	1	-1	-1	8	.00002
1	-1	2	1	.00061	.000001	1	-1	-1	-8	.00002
1	-1	2	2	-.07392	-.000005	1	-1	-1	-7	-.00001
1	-1	2	3	.00005		1	-1	-1	-6	.00116
1	-1	2	4	-.00251		1	-1	-1	-5	-.00053
1	-1	2	6	-.00006		1	-1	-1	-4	.05110
1	-1	2	-6	.00007	-.000006	1	-1	-1	-3	-.02088
1	-1	2	-5	-.00016	.000002	1	-1	-1	-2	1.32117
1	-1	2	-4	.01880	-.000116	1	-1	-1	-1	.05604
1	-1	2	-3	-.00116	-.000002	2	0	1	0	61.91227
1	-1	2	-2	.00228	.000486	2	0	1	1	-.06383
1	-1	2	-1	.00008	-.000027	2	0	1	2	1.51975
1	-1	4	0	.00064		2	0	1	3	-.00108
1	-1	4	2	.00025		2	0	1	4	.02828
1	-1	4	4	.00001		2	0	1	5	-.00001
1	-1	4	-2	-.00017		2	0	1	6	.00048
1	-1	-4	0	-.00013		2	0	1	8	.00001
1	-1	-4	1	.00001		2	0	1	-10	-.00003
1	-1	-4	2	.00018	.000009	2	0	1	-8	-.00189
1	-1	-4	4	-.00006		2	0	1	-7	.00024
1	-1	-4	-4	.00001		2	0	1	-6	-.08095
1	-1	-4	-2	.00016		2	0	1	-5	.00505
1	-1	-4	-1	-.00001		2	0	1	-4	-.63371
1	-1	-2	0	.08069	-.002885	2	0	1	-3	.03941
1	-1	-2	1	-.00213	.000004	2	0	1	-2	-15.56636
1	-1	-2	2	-.37547	-.002644	2	0	1	-1	.10964
1	-1	-2	3	-.00084	-.000011	2	0	3	0	-.11787
1	-1	-2	4	-.00733	-.000058	2	0	3	1	.00021
1	-1	-2	5	-.00003	-.000001	2	0	3	2	-.00451
1	-1	-2	6	-.00016		2	0	3	3	.00001
1	-1	-2	-6	-.00010		2	0	3	4	-.00012
1	-1	-2	-5	.00005		2	0	3	-8	-.00002
1	-1	-2	-4	-.00354	.000004	2	0	3	-6	-.00007
1	-1	-2	-3	.00138	-.000002	2	0	3	-5	-.00001
1	-1	-2	-2	-.06759	.000107	2	0	3	-4	.00390
1	-1	-2	-1		-.000058	2	0	3	-3	.00008
2	0	0	0	769.02297	10.165249	2	0	3	-2	-.02045
2	0	0	1	-.58398	-.009918	2	0	3	-1	.00025
2	0	0	2	14.37951	.282814	2	0	5	0	.00026

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
2	0	0	3	-.00389	-.000127	2	0	5	2	.00001
2	0	0	4	.21852	.005473	2	0	5	-2	.00005
2	0	0	5	.00001	-.000001	2	0	-5	0	-.00044
2	0	0	6	.00318	.000095	2	0	-5	2	.00008
2	0	0	8	.00005	.000002	2	0	-5	-4	-.00001
2	0	0	-10	-.00013	.000004	2	0	-5	-2	-.00012
2	0	0	-9	.00001		2	0	-3	0	-.13035
2	0	0	-8	-.00866	.000211	2	0	-3	2	-.00995
2	0	0	-7	.00068	-.000016	2	0	-3	4	-.00090
2	0	0	-6	-.57155	.010796	2	0	-3	6	-.00002
2	0	0	-5	.05725	-.000892	2	0	-3	-8	.00001
2	0	0	-4	-30.77229	.372313	2	0	-3	-6	.00021
2	0	0	-3	1.22413	-.008652	2	0	-3	-5	-.00002
2	0	0	-2	-211.65522	-.304044	2	0	-3	-4	.00632
2	0	0	-1	1.75299	.015114	2	0	-3	-3	-.00016
2	0	2	0	-3.99766	-.000162	2	0	-3	-2	.06561
2	0	2	1	.00540	.000004	2	0	-3	-1	.00020
2	0	2	2	-.12386	-.000011	2	0	-1	0	31.75981
2	0	2	3	.00014		2	0	-1	1	-.03636
2	0	2	4	-.00274		2	0	-1	2	2.14616
2	0	2	6	-.00005		2	0	-1	3	-.00322
2	0	2	-8	-.00001	.000003	2	0	-1	4	.04834
2	0	2	-7	.00005	-.000001	2	0	-1	5	-.00006
2	0	2	-6	-.00364	.000038	2	0	-1	6	.00088
2	0	2	-5	.00031	-.000001	2	0	-1	8	.00001
2	0	2	-4	-.00662	.000038	2	0	-1	-10	-.00002
2	0	2	-3	.00028	.000022	2	0	-1	-8	-.00111
2	0	2	-2	.56065	-.008798	2	0	-1	-7	.00010
2	0	2	-1	-.00289	.000076	2	0	-1	-6	-.05963
2	0	4	0	.01297		2	0	-1	-5	.00519
2	0	4	1	-.00003		2	0	-1	-4	-2.41387
2	0	4	2	.00059		2	0	-1	-3	.04852
2	0	4	4	.00002		2	0	-1	-2	1.62442
2	0	4	-4	-.00013	.000003	2	0	-1	-1	.07846
2	0	4	-2	-.00037	.000001	2	1	1	0	-.64044
2	0	4	-1	-.00001		2	1	1	1	.01019
2	0	6	0	-.00003		2	1	1	2	-.03149
2	0	-6	0	.00001		2	1	1	3	.00035
2	0	-6	-2	.00001		2	1	1	4	-.00088
2	0	-4	0	.00068	.000150	2	1	1	5	.00001
2	0	-4	1	.00001		2	1	1	6	-.00002
2	0	-4	2	.00008	-.000001	2	1	1	-10	-.00001
2	0	-4	4	.00001		2	1	1	-8	-.00038
2	0	-4	-6	-.00003		2	1	1	-7	.00004
2	0	-4	-4	-.00061		2	1	1	-6	-.01094
2	0	-4	-3	.00001		2	1	1	-5	.00057
2	0	-4	-2	-.00282	.000004	2	1	1	-4	-.05265
2	0	-2	0	-1.37261	.000309	2	1	1	-3	.00283
2	0	-2	1	-.00077	-.000005	2	1	1	-2	-.65187
2	0	-2	2	-.45380	-.005385	2	1	1	-1	-.00097
2	0	-2	3	-.00051	-.000010	2	1	3	0	.00135
2	0	-2	4	-.00980	-.000114	2	1	3	1	-.00003
2	0	-2	5	-.00002	-.000001	2	1	3	2	.00010
2	0	-2	6	-.00018	-.000002	2	1	3	-6	-.00001
2	0	-2	-8	.00011		2	1	3	-4	.00033

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
2	0	-2	-7	-.00001		2	1	3	-3	.00001
2	0	-2	-6	.00509	-.000008	2	1	3	-2	-.00033
2	0	-2	-5	-.00039	.000001	2	1	-3	0	.00141
2	0	-2	-4	.16977	-.000403	2	1	-3	1	.00001
2	0	-2	-3	-.00298	.000023	2	1	-3	2	.00021
2	0	-2	-2	.53572	-.014136	2	1	-3	4	.00003
2	0	-2	-1	.00142	-.000036	2	1	-3	-6	.00003
2	1	0	0	-7.64953	-.103325	2	1	-3	-4	.00060
2	1	0	1	.09228	.001589	2	1	-3	-3	-.00001
2	1	0	2	-.29095	-.005831	2	1	-3	-2	.00267
2	1	0	3	.00257	.000060	2	1	-3	-1	-.00001
2	1	0	4	-.00670	-.000171	2	1	-1	0	-.31371
2	1	0	5	.00005	.000001	2	1	-1	1	.00318
2	1	0	6	-.00013	-.000004	2	1	-1	2	-.06299
2	1	0	-10	-.00004	.000001	2	1	-1	3	.00044
2	1	0	-8	-.00196	.000047	2	1	-1	4	-.00197
2	1	0	-7	.00012	-.000003	2	1	-1	5	.00001
2	1	0	-6	-.09055	.001687	2	1	-1	6	-.00005
2	1	0	-5	.00695	-.000106	2	1	-1	-10	-.00001
2	1	0	-4	-2.73880	.032202	2	1	-1	-8	-.00025
2	1	0	-3	.08332	-.000548	2	1	-1	-7	.00002
2	1	0	-2	-8.62735	-.019105	2	1	-1	-6	-.00942
2	1	0	-1	.00696	.000063	2	1	-1	-5	.00061
2	1	2	0	.04349	.000009	2	1	-1	-4	-.21429
2	1	2	1	-.00084		2	1	-1	-3	.00330
2	1	2	2	.00263	.000001	2	1	-1	-2	.06224
2	1	2	3	-.00004		2	1	-1	-1	.00138
2	1	2	4	.00009		2	2	1	0	-.00531
2	1	2	-8		.000001	2	2	1	1	-.00012
2	1	2	-7	.00001		2	2	1	2	-.00009
2	1	2	-6	-.00044	.000004	2	2	1	3	-.00001
2	1	2	-5	.00003		2	2	1	-8	-.00004
2	1	2	-4	-.00043	.000005	2	2	1	-6	-.00088
2	1	2	-3		.000002	2	2	1	-5	.00004
2	1	2	-2	.02811	-.000287	2	2	1	-4	-.00285
2	1	2	-1	.00011	-.000001	2	2	1	-3	.00014
2	1	4	0	-.00015		2	2	1	-2	-.02296
2	1	4	2	-.00001		2	2	1	-1	-.00007
2	1	4	-4	-.00001		2	2	3	0	.00001
2	1	4	-2	-.00005		2	2	3	-4	.00002
2	1	-4	0	-.00003	-.000001	2	2	-3	0	.00001
2	1	-4	2	.00001		2	2	-3	2	-.00001
2	1	-4	-4	-.00006		2	2	-3	-4	.00004
2	1	-4	-2	-.00012		2	2	-3	-2	.00009
2	1	-2	0	.02683	.000014	2	2	-1	0	-.00285
2	1	-2	1	.00028	.000002	2	2	-1	1	-.00003
2	1	-2	2	.00891	.000103	2	2	-1	2	-.00026
2	1	-2	3	-.00001		2	2	-1	3	-.00001
2	1	-2	4	.00032	.000002	2	2	-1	-8	-.00003
2	1	-2	6	.00001		2	2	-1	-6	-.00087
2	1	-2	-8	.00003		2	2	-1	-5	.00004
2	1	-2	-6	.00081	-.000001	2	2	-1	-4	-.01237
2	1	-2	-5	-.00004		2	2	-1	-3	.00016
2	1	-2	-4	.01537	-.000043	2	2	-1	-2	.00193
2	1	-2	-3	-.00020	.000001	2	2	-1	-1	.00003

Table I (*continued*)

1	1′	F	D	Longitude	Parallax	1	1′	F	D	Latitude
2	1	-2	-2	.02162	-.000553	2	3	1	0	-.00008
2	1	-2	-1	-.00014	.000001	2	3	1	-6	-.00006
2	2	0	0	-.06546	-.000900	2	3	1	-4	-.00013
2	2	0	1	-.00103	-.000018	2	3	1	-3	.00001
2	2	0	2	-.00066	-.000014	2	3	1	-2	-.00077
2	2	0	3	-.00006	-.000001	2	3	-1	0	-.00004
2	2	0	4	.00001		2	3	-1	2	.00001
2	2	0	-10	-.00001		2	3	-1	-6	-.00006
2	2	0	-8	-.00025	.000006	2	3	-1	-4	-.00059
2	2	0	-7	.00001		2	3	-1	-3	.00001
2	2	0	-6	-.00840	.000154	2	3	-1	-2	.00005
2	2	0	-5	.00052	-.000008	2	4	1	-4	-.00001
2	2	0	-4	-.15860	.001809	2	4	1	-2	-.00003
2	2	0	-3	.00401	-.000024	2	4	-1	-4	-.00003
2	2	0	-2	-.29569	-.000876	2	-4	1	0	.00001
2	2	0	-1	-.00026	-.000002	2	-4	1	2	.00001
2	2	2	0	.00035		2	-4	-1	2	.00001
2	2	2	1	.00001		2	-3	1	0	.00034
2	2	2	2	.00001		2	-3	1	2	.00031
2	2	2	-6	-.00003		2	-3	1	4	.00003
2	2	2	-4	-.00002		2	-3	1	-4	-.00001
2	2	2	-2	.00112	-.000008	2	-3	1	-2	.00006
2	2	2	-1	.00001		2	-3	-1	0	.00011
2	2	-2	0	.00040	.000001	2	-3	-1	2	.00021
2	2	-2	2	-.00014	-.000002	2	-3	-1	4	.00003
2	2	-2	-6	.00007		2	-3	-1	-4	-.00002
2	2	-2	-4	.00090	-.000003	2	-3	-1	-2	.00002
2	2	-2	-3	-.00001		2	-2	1	0	.01579
2	2	-2	-2	.00073	-.000018	2	-2	1	1	-.00003
2	2	-2	-1	-.00001		2	-2	1	2	.00680
2	3	0	0	-.00096	-.000013	2	-2	1	4	.00037
2	3	0	1	-.00001		2	-2	1	6	.00001
2	3	0	2	.00001		2	-2	1	-6	.00009
2	3	0	-8	-.00002	.000001	2	-2	1	-4	.00114
2	3	0	-6	-.00060	.000011	2	-2	1	-3	.00002
2	3	0	-5	.00003		2	-2	1	-2	.01268
2	3	0	-4	-.00761	.000084	2	-2	1	-1	-.00017
2	3	0	-3	.00017	-.000001	2	-2	3	0	-.00003
2	3	0	-2	-.00972	-.000036	2	-2	3	2	-.00002
2	3	0	-1	-.00002		2	-2	3	-4	-.00001
2	3	2	-2	.00004		2	-2	3	-2	.00004
2	3	-2	0	.00001		2	-2	-3	0	-.00004
2	3	-2	-6	.00001		2	-2	-3	2	-.00003
2	3	-2	-4	.00004		2	-2	-3	4	-.00001
2	3	-2	-2	.00002	-.000001	2	-2	-3	-4	-.00001
2	4	0	0	-.00002		2	-2	-3	-2	-.00004
2	4	0	-6	-.00004	.000001	2	-2	-1	0	.00538
2	4	0	-4	-.00033	.000004	2	-2	-1	1	-.00006
2	4	0	-3	.00001		2	-2	-1	2	.00557
2	4	0	-2	-.00032	-.000001	2	-2	-1	3	-.00001
2	5	0	-4	-.00001		2	-2	-1	4	.00047
2	5	0	-2	-.00001		2	-2	-1	6	.00002
2	-4	0	0	.00009	.000001	2	-2	-1	-6	.00006
2	-4	0	2	.00012	.000002	2	-2	-1	-4	.00279
2	-4	0	4	.00001		2	-2	-1	-3	.00001

Table I (*continued*)

I	I′	F	D	Longitude	Parallax	I	I′	F	D	Latitude
2	-4	0	-4	-.00001		2	-2	-1	-2	.00506
2	-4	0	-2	.00001		2	-2	-1	-1	-.00016
2	-3	0	0	.00419	.000052	2	-1	1	0	.79521
2	-3	0	1	-.00001		2	-1	1	1	-.00146
2	-3	0	2	.00297	.000056	2	-1	1	2	.12418
2	-3	0	4	.00020	.000005	2	-1	1	3	-.00007
2	-3	0	6	.00001		2	-1	1	4	.00422
2	-3	0	-6	-.00001		2	-1	1	6	.00010
2	-3	0	-4	-.00020	.000003	2	-1	1	-8	.00008
2	-3	0	-3	-.00004		2	-1	1	-7	-.00002
2	-3	0	-2	.00094	-.000001	2	-1	1	-6	.00257
2	-3	0	-1	-.00007	-.000001	2	-1	1	-5	-.00014
2	-3	2	0	-.00002		2	-1	1	-4	.00203
2	-3	2	2	-.00003		2	-1	1	-3	.00152
2	-3	-2	0	-.00002		2	-1	1	-2	-.07933
2	-3	-2	2	-.00005	-.000001	2	-1	1	-1	-.01601
2	-3	-2	4	-.00001		2	-1	3	0	-.00154
2	-2	0	0	.19408	.002450	2	-1	3	2	-.00036
2	-2	0	1	-.00037	-.000006	2	-1	3	4	-.00002
2	-2	0	2	.06471	.001239	2	-1	3	-4	-.00003
2	-2	0	3	.00001		2	-1	3	-2	.00015
2	-2	0	4	.00292	.000072	2	-1	3	-1	.00001
2	-2	0	6	.00008	.000002	2	-1	-5	2	.00001
2	-2	0	-8	.00001		2	-1	-3	0	-.00192
2	-2	0	-6	.00061	-.000012	2	-1	-3	1	.00001
2	-2	0	-5	.00001		2	-1	-3	2	-.00061
2	-2	0	-4	.03532	-.000448	2	-1	-3	4	-.00010
2	-2	0	-3	.00037	-.000003	2	-1	-3	-6	-.00001
2	-2	0	-2	.25119	-.000047	2	-1	-3	-4	-.00009
2	-2	0	-1	-.00363	-.000028	2	-1	-3	-3	.00001
2	-2	2	0	-.00100		2	-1	-3	-2	-.00017
2	-2	2	2	-.00055		2	-1	-3	-1	-.00006
2	-2	2	4	-.00004		2	-1	-1	0	.30205
2	-2	2	-6	-.00001		2	-1	-1	1	-.00176
2	-2	2	-4	-.00008		2	-1	-1	2	.12929
2	-2	2	-2	-.00006	.000010	2	-1	-1	3	-.00027
2	-2	2	-1	.00001		2	-1	-1	4	.00616
2	-2	-2	0	-.00060	.000001	2	-1	-1	5	-.00001
2	-2	-2	1	.00001		2	-1	-1	6	.00017
2	-2	-2	2	-.00134	-.000015	2	-1	-1	-8	.00004
2	-2	-2	4	-.00009	-.000001	2	-1	-1	-7	-.00002
2	-2	-2	-6	-.00001		2	-1	-1	-6	.00137
2	-2	-2	-4	-.00019		2	-1	-1	-5	-.00041
2	-2	-2	-2	-.00061	.000008	2	-1	-1	-4	.02964
2	-1	0	0	9.70363	.125405	2	-1	-1	-3	.00262
2	-1	0	1	-.01487	-.000244	2	-1	-1	-2	-.05443
2	-1	0	2	1.17998	.022870	2	-1	-1	-1	-.01684
2	-1	0	3	-.00011	-.000006	3	0	1	0	3.98407
2	-1	0	4	.03283	.000812	3	0	1	1	-.00553
2	-1	0	5	.00001		3	0	1	2	.13795
2	-1	0	6	.00069	.000020	3	0	1	3	-.00014
2	-1	0	8	.00001		3	0	1	4	.00323
2	-1	0	-10	.00001		3	0	1	6	.00006
2	-1	0	-8	.00029	-.000007	3	0	1	-10	-.00003
2	-1	0	-7	-.00011	.000003	3	0	1	-8	-.00107

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l̈	l′	F	D	Latitude
2	-1	0	-6	.01285	-.000248	3	0	1	-7	.00009
2	-1	0	-5	-.00393	.000064	3	0	1	-6	-.00702
2	-1	0	-4	.35849	-.004478	3	0	1	-5	.00033
2	-1	0	-3	.04199	-.000318	3	0	1	-4	.00771
2	-1	0	-2	-2.49526	-.001588	3	0	1	-3	.00287
2	-1	0	-1	-.35054	-.002873	3	0	1	-2	-1.51564
2	-1	2	0	-.05178	.000001	3	0	1	-1	.01255
2	-1	2	1	.00012		3	0	3	0	-.01181
2	-1	2	2	-.01009	-.000001	3	0	3	1	.00002
2	-1	2	3	.00001		3	0	3	2	-.00056
2	-1	2	4	-.00041		3	0	3	4	-.00002
2	-1	2	6	-.00001		3	0	3	-4	.00066
2	-1	2	-6	.00026	-.000003	3	0	3	-2	-.00023
2	-1	2	-5	-.00001		3	0	3	-1	.00001
2	-1	2	-4	.00039		3	0	5	0	.00003
2	-1	2	-3	-.00001	.000001	3	0	-5	0	.00003
2	-1	2	-2	.00347	-.000005	3	0	-5	-2	-.00002
2	-1	2	-1	.00071	-.000002	3	0	-3	0	-.00146
2	-1	4	0	.00017		3	0	-3	2	-.00093
2	-1	4	2	.00005		3	0	-3	4	-.00010
2	-1	4	-2	-.00002		3	0	-3	-8	.00001
2	-1	-4	0	.00004	.000001	3	0	-3	-6	.00014
2	-1	-4	2	.00001		3	0	-3	-5	-.00001
2	-1	-4	-4	.00001		3	0	-3	-4	.00127
2	-1	-4	-2	.00001		3	0	-3	-3	-.00001
2	-1	-2	0	-.02435	.000026	3	0	-3	-2	-.00232
2	-1	-2	1	.00012	.000001	3	0	-3	-1	-.00002
2	-1	-2	2	-.02894	-.000340	3	0	-1	0	1.58130
2	-1	-2	3	-.00004	-.000001	3	0	-1	1	-.00247
2	-1	-2	4	-.00121	-.000015	3	0	-1	2	.14642
2	-1	-2	6	-.00003		3	0	-1	3	-.00027
2	-1	-2	-6	-.00012		3	0	-1	4	.00449
2	-1	-2	-5	.00004		3	0	-1	5	-.00001
2	-1	-2	-4	-.00221	.000006	3	0	-1	6	.00010
2	-1	-2	-3	-.00007	-.000002	3	0	-1	-10	-.00003
2	-1	-2	-2	.00001	.000036	3	0	-1	-8	-.00108
2	-1	-2	-1	-.00063	.000012	3	0	-1	-7	.00011
3	0	0	0	36.12360	.621487	3	0	-1	-6	-.03118
3	0	0	1	-.04074	-.000834	3	0	-1	-5	.00124
3	0	0	2	1.05947	.024241	3	0	-1	-4	-.02174
3	0	0	3	-.00062	-.000019	3	0	-1	-3	-.00015
3	0	0	4	.02149	.000599	3	0	-1	-2	-.25408
3	0	0	6	.00038	.000012	3	0	-1	-1	.00537
3	0	0	8	.00001		3	1	1	0	-.06192
3	0	0	-10	-.00017	.000005	3	1	1	1	.00093
3	0	0	-9	.00002		3	1	1	2	-.00356
3	0	0	-8	-.00840	.000183	3	1	1	3	.00004
3	0	0	-7	.00098	-.000018	3	1	1	4	-.00012
3	0	0	-6	-.29255	.004627	3	1	1	-10	-.00001
3	0	0	-5	.01686	-.000199	3	1	1	-8	-.00019
3	0	0	-4	-1.18681	.007474	3	1	1	-7	.00001
3	0	0	-3	.04443	.000094	3	1	1	-6	-.00089
3	0	0	-2	-13.19403	-.118706	3	1	1	-5	.00004
3	0	0	-1	.12812	.001722	3	1	1	-4	.00091
3	0	2	0	-.32866	-.000022	3	1	1	-3	.00022

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
3	0	2	1	.00056		3	1	1	-2	-.05515
3	0	2	2	-.01333	-.000001	3	1	1	-1	-.00018
3	0	2	3	.00002		3	1	3	0	.00019
3	0	2	4	-.00036		3	1	3	2	.00001
3	0	2	6	-.00001		3	1	3	-4	.00005
3	0	2	-8	-.00005	.000001	3	1	3	-2	.00004
3	0	2	-7	.00001		3	1	-3	0	.00002
3	0	2	-6	-.00018		3	1	-3	2	.00002
3	0	2	-4	-.00023	.000059	3	1	-3	-6	.00002
3	0	2	-3	-.00011	.000001	3	1	-3	-4	.00011
3	0	2	-2	.09154	-.000801	3	1	-3	-2	-.00007
3	0	2	-1	-.00069	.000007	3	1	-1	0	-.02425
3	0	4	0	.00153		3	1	-1	1	.00027
3	0	4	2	.00008		3	1	-1	2	-.00498
3	0	4	-4	-.00002		3	1	-1	3	.00004
3	0	4	-2	-.00024		3	1	-1	4	-.00020
3	0	6	0	-.00001		3	1	-1	6	-.00001
3	0	-4	0	.00009	-.000001	3	1	-1	-10	-.00001
3	0	-4	2	.00002		3	1	-1	-8	-.00022
3	0	-4	4	.00001		3	1	-1	-7	.00002
3	0	-4	-6	-.00002		3	1	-1	-6	-.00416
3	0	-4	-4	-.00007		3	1	-1	-5	.00014
3	0	-4	-2	.00003	.000005	3	1	-1	-4	-.00191
3	0	-2	0	-.05682	-.000512	3	1	-1	-3	-.00001
3	0	-2	1	-.00006	-.000001	3	1	-1	-2	-.00937
3	0	-2	2	-.03336	-.000503	3	1	-1	-1	.00004
3	0	-2	3	-.00002	-.000001	3	2	1	0	-.00037
3	0	-2	4	-.00109	-.000016	3	2	1	1	-.00001
3	0	-2	6	-.00003		3	2	1	-8	-.00002
3	0	-2	-8	.00011		3	2	1	-6	-.00007
3	0	-2	-7	-.00001		3	2	1	-4	.00006
3	0	-2	-6	.00287	-.000010	3	2	1	-3	.00001
3	0	-2	-5	-.00010	.000001	3	2	1	-2	-.00179
3	0	-2	-4	.00934	-.000250	3	2	1	-1	-.00001
3	0	-2	-3	-.00011	.000003	3	2	-3	-4	.00001
3	0	-2	-2	-.00469	.000039	3	2	-1	0	-.00016
3	0	-2	-1	-.00038		3	2	-1	-8	-.00003
3	1	0	0	-.54731	-.009539	3	2	-1	-6	-.00033
3	1	0	1	.00681	.000141	3	2	-1	-5	.00001
3	1	0	2	-.02682	-.000623	3	2	-1	-4	-.00011
3	1	0	3	.00026	.000007	3	2	-1	-2	-.00031
3	1	0	4	-.00077	-.000022	3	3	1	-2	-.00006
3	1	0	5	.00001		3	3	-1	-6	-.00002
3	1	0	6	-.00002	-.000001	3	3	-1	-4	-.00001
3	1	0	-10	-.00005	.000001	3	3	-1	-2	-.00001
3	1	0	-8	-.00170	.000037	3	-3	1	0	.00004
3	1	0	-7	.00016	-.000003	3	-3	1	2	.00003
3	1	0	-6	-.03910	.000607	3	-3	1	-2	.00001
3	1	0	-5	.00189	-.000022	3	-3	-1	0	.00001
3	1	0	-4	-.10007	.000575	3	-3	-1	2	.00002
3	1	0	-3	.00298	.000009	3	-2	1	0	.00170
3	1	0	-2	-.47961	-.004512	3	-2	1	1	-.00001
3	1	0	-1	-.00069	-.000009	3	-2	1	2	.00070
3	1	2	0	.00527	.000001	3	-2	1	4	.00005
3	1	2	1	-.00009		3	-2	1	-6	.00002

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
3	1	2	2	.00035		3	-2	1	-4	.00003
3	1	2	4	.00001		3	-2	1	-3	.00001
3	1	2	-8	-.00001		3	-2	1	-2	.00103
3	1	2	-6	-.00002		3	-2	1	-1	-.00003
3	1	2	-4	-.00007	.000005	3	-2	-1	0	.00049
3	1	2	-3	-.00001		3	-2	-1	1	-.00001
3	1	2	-2	.00366	-.000022	3	-2	-1	2	.00046
3	1	2	-1	.00002		3	-2	-1	4	.00005
3	1	4	0	-.00003		3	-2	-1	-6	.00005
3	1	4	-2	-.00001		3	-2	-1	-4	.00020
3	1	-4	-4	-.00001		3	-2	-1	-2	.00003
3	1	-2	0	.00167	.000015	3	-2	-1	-1	-.00001
3	1	-2	1	.00002		3	-1	1	0	.07498
3	1	-2	2	.00085	.000012	3	-1	1	1	-.00018
3	1	-2	4	.00004		3	-1	1	2	.01214
3	1	-2	-8	.00002		3	-1	1	3	-.00001
3	1	-2	-6	.00039	-.000002	3	-1	1	4	.00050
3	1	-2	-5	-.00001		3	-1	1	6	.00001
3	1	-2	-4	.00079	-.000021	3	-1	1	-8	.00004
3	1	-2	-3	-.00001		3	-1	1	-6	.00003
3	1	-2	-2	-.00003	.000001	3	-1	1	-5	.00001
3	1	-2	-1	-.00002		3	-1	1	-4	-.00063
3	2	0	0	-.00343	-.000060	3	-1	1	-3	.00044
3	2	0	1	-.00011	-.000002	3	-1	1	-2	-.01823
3	2	0	3	-.00001		3	-1	1	-1	-.00186
3	2	0	-10	-.00001		3	-1	3	0	-.00023
3	2	0	-8	-.00020	.000004	3	-1	3	2	-.00005
3	2	0	-7	.00002		3	-1	3	-2	.00002
3	2	0	-6	-.00314	.000048	3	-1	-3	0	-.00002
3	2	0	-5	.00013	-.000001	3	-1	-3	2	-.00006
3	2	0	-4	-.00563	.000029	3	-1	-3	4	-.00001
3	2	0	-3	.00014	.000001	3	-1	-3	-4	-.00001
3	2	0	-2	-.01552	-.000152	3	-1	-3	-2	.00001
3	2	0	-1	-.00005	-.000001	3	-1	-1	0	.02371
3	2	2	0	.00003		3	-1	-1	1	-.00015
3	2	2	-4	-.00001		3	-1	-1	2	.00987
3	2	2	-2	.00013	-.000001	3	-1	-1	3	-.00002
3	2	-2	0	.00002		3	-1	-1	4	.00060
3	2	-2	2	-.00001		3	-1	-1	6	.00002
3	2	-2	-6	.00003		3	-1	-1	-8	.00003
3	2	-2	-4	.00004	-.000001	3	-1	-1	-7	-.00001
3	3	0	0	-.00005	-.000001	3	-1	-1	-6	.00054
3	3	0	-8	-.00002		3	-1	-1	-5	.00005
3	3	0	-6	-.00020	.000003	3	-1	-1	-4	-.00193
3	3	0	-5	.00001		3	-1	-1	-3	-.00004
3	3	0	-4	-.00027	.000001	3	-1	-1	-2	-.00162
3	3	0	-3	.00001		3	-1	-1	-1	-.00093
3	3	0	-2	-.00050	-.000005	4	0	1	0	.26325
3	4	0	-6	-.00001		4	0	1	1	-.00045
3	4	0	-4	-.00001		4	0	1	2	.01186
3	4	0	-2	-.00002		4	0	1	3	-.00002
3	-4	0	0	.00001		4	0	1	4	.00034
3	-4	0	2	.00001		4	0	1	6	.00001
3	-3	0	0	.00035	.000006	4	0	1	-10	-.00001
3	-3	0	2	.00026	.000006	4	0	1	-8	-.00009

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
3	-3	0	4	.00002	.000001	4	0	1	-7	.00001
3	-3	0	-6	-.00001		4	0	1	-6	-.00014
3	-3	0	-3	-.00001		4	0	1	-4	.00680
3	-3	0	-2	.00009	.000001	4	0	1	-3	.00016
3	-3	0	-1	-.00001		4	0	1	-2	-.13381
3	-2	0	0	.01522	.000255	4	0	1	-1	.00122
3	-2	0	1	-.00005	-.000001	4	0	3	0	-.00109
3	-2	0	2	.00540	.000121	4	0	3	2	-.00006
3	-2	0	4	.00031	.000008	4	0	3	-4	.00007
3	-2	0	6	.00001		4	0	3	-2	.00014
3	-2	0	-8	.00001		4	0	-3	0	-.00006
3	-2	0	-6	.00052	-.000008	4	0	-3	2	-.00008
3	-2	0	-5	-.00001		4	0	-3	4	-.00001
3	-2	0	-4	.00371	-.000028	4	0	-3	-6	.00002
3	-2	0	-3	.00020		4	0	-3	-4	-.00003
3	-2	0	-2	.00949	.000077	4	0	-3	-2	.00002
3	-2	0	-1	-.00038	-.000005	4	0	-1	0	.09157
3	-2	2	0	-.00014		4	0	-1	1	-.00017
3	-2	2	2	-.00007		4	0	-1	2	.01027
3	-2	2	-4	-.00001		4	0	-1	3	-.00002
3	-2	2	-2	-.00003	.000001	4	0	-1	4	.00040
3	-2	-2	0	-.00003		4	0	-1	6	.00001
3	-2	-2	2	-.00011	-.000002	4	0	-1	-10	-.00002
3	-2	-2	4	-.00001		4	0	-1	-8	-.00042
3	-2	-2	-4	-.00002		4	0	-1	-7	.00003
3	-2	-2	-2	-.00002		4	0	-1	-6	-.00072
3	-1	0	0	.67108	.011393	4	0	-1	-5	.00001
3	-1	0	1	-.00149	-.000030	4	0	-1	-4	-.00029
3	-1	0	2	.09344	.002111	4	0	-1	-3	.00003
3	-1	0	3	-.00005	-.000001	4	0	-1	-2	-.02495
3	-1	0	4	.00337	.000093	4	0	-1	-1	.00043
3	-1	0	6	.00009	.000003	4	1	1	0	-.00549
3	-1	0	-10	.00001		4	1	1	1	.00008
3	-1	0	-8	.00024	-.000005	4	1	1	2	-.00037
3	-1	0	-7	-.00006	.000001	4	1	1	4	-.00001
3	-1	0	-6	.00480	-.000078	4	1	1	-8	-.00002
3	-1	0	-5	.00046	-.000006	4	1	1	-6	-.00002
3	-1	0	-4	-.02689	.000193	4	1	1	-4	.00058
3	-1	0	-3	.00625	.000008	4	1	1	-3	.00001
3	-1	0	-2	-.17668	-.001521	4	1	1	-2	-.00417
3	-1	0	-1	-.02302	-.000303	4	1	1	-1	-.00003
3	-1	2	0	-.00624	-.000001	4	1	3	0	.00002
3	-1	2	1	.00002		4	1	3	-2	.00001
3	-1	2	2	-.00117		4	1	-1	0	-.00191
3	-1	2	4	-.00005		4	1	-1	1	.00002
3	-1	2	-6	.00001		4	1	-1	2	-.00040
3	-1	2	-4	.00004		4	1	-1	4	-.00002
3	-1	2	-3	-.00002		4	1	-1	-8	-.00008
3	-1	2	-2	.00116	-.000006	4	1	-1	-6	-.00009
3	-1	2	-1	.00012		4	1	-1	-4	-.00002
3	-1	4	0	.00003		4	1	-1	-2	-.00080
3	-1	4	2	.00001		4	2	1	0	-.00002
3	-1	-2	0	-.00106	-.000009	4	2	1	-4	.00003
3	-1	-2	1	.00001		4	2	1	-2	-.00012
3	-1	-2	2	-.00232	-.000035	4	2	-1	0	-.00001

Table I (*continued*)

l	l′	F	D	Longitude	Parallax	l	l′	F	D	Latitude
3	-1	-2	4	-.00014	-.000002	4	2	-1	-8	-.00001
3	-1	-2	-6	-.00005		4	2	-1	-6	-.00001
3	-1	-2	-4	.00003	.000002	4	2	-1	-2	-.00002
3	-1	-2	-3	-.00002		4	-2	1	0	.00016
3	-1	-2	-2	.00024	-.000003	4	-2	1	2	.00007
3	-1	-2	-1	.00006		4	-2	1	4	.00001
4	0	0	0	1.93367	.039920	4	-2	1	-4	-.00001
4	0	0	1	-.00285	-.000067	4	-2	1	-2	.00007
4	0	0	2	.07765	.002005	4	-2	-1	0	.00004
4	0	0	3	-.00007	-.000002	4	-2	-1	2	.00004
4	0	0	4	.00198	.000060	4	-2	-1	-2	.00001
4	0	0	6	.00004	.000001	4	-1	1	0	.00648
4	0	0	-10	-.00012	.000003	4	-1	1	1	-.00002
4	0	0	-9	.00002		4	-1	1	2	.00112
4	0	0	-8	-.00323	.000062	4	-1	1	4	.00005
4	0	0	-7	.00025	-.000004	4	-1	1	-6	-.00001
4	0	0	-6	-.01376	.000159	4	-1	1	-4	.00001
4	0	0	-5	.00059	-.000003	4	-1	1	-3	.00007
4	0	0	-4	.00069	.000010	4	-1	1	-2	-.00248
4	0	0	-3	.00174	.000016	4	-1	1	-1	-.00017
4	0	0	-2	-.94827	-.012915	4	-1	3	0	-.00003
4	0	0	-1	.00955	.000166	4	-1	3	2	-.00001
4	0	2	0	-.02602	-.000003	4	-1	-3	2	-.00001
4	0	2	1	.00005		4	-1	-1	0	.00187
4	0	2	2	-.00131		4	-1	-1	1	-.00001
4	0	2	4	-.00004		4	-1	-1	2	.00076
4	0	2	-4	-.00042	.000012	4	-1	-1	4	.00006
4	0	2	-3	-.00001		4	-1	-1	-8	.00001
4	0	2	-2	.01077	-.000069	4	-1	-1	-6	-.00003
4	0	2	-1	-.00009	.000001	4	-1	-1	-4	.00001
4	0	4	0	.00016		4	-1	-1	-3	.00001
4	0	4	2	.00001		4	-1	-1	-2	-.00034
4	0	4	-2	-.00005		4	-1	-1	-1	-.00007
4	0	-2	0	-.00354	-.000043	5	0	1	0	.01768
4	0	-2	2	-.00247	-.000044	5	0	1	1	-.00004
4	0	-2	4	-.00011	-.000002	5	0	1	2	.00099
4	0	-2	-8	.00005		5	0	1	4	.00003
4	0	-2	-6	.00017	-.000004	5	0	1	-4	.00116
4	0	-2	-4	.00002	-.000002	5	0	1	-2	-.01127
4	0	-2	-2	.00055	.000001	5	0	1	-1	.00011
4	0	-2	-1	-.00002		5	0	3	0	-.00009
4	1	0	0	-.03957	-.000824	5	0	3	2	-.00001
4	1	0	1	.00050	.000012	5	0	3	-4	.00001
4	1	0	2	-.00237	-.000062	5	0	3	-2	.00003
4	1	0	3	.00002	.000001	5	0	-3	2	-.00001
4	1	0	4	-.00008	-.000002	5	0	-1	0	.00565
4	1	0	-10	-.00003	.000001	5	0	-1	1	-.00001
4	1	0	-8	-.00058	.000011	5	0	-1	2	.00073
4	1	0	-7	.00004	-.000001	5	0	-1	4	.00003
4	1	0	-6	-.00177	.000020	5	0	-1	-10	-.00001
4	1	0	-5	.00007		5	0	-1	-8	-.00001
4	1	0	-4	.00020	.000001	5	0	-1	-4	.00001
4	1	0	-3	.00013	.000001	5	0	-1	-2	-.00230
4	1	0	-2	-.02956	-.000413	5	0	-1	-1	.00004
4	1	0	-1	-.00014	-.000002	5	1	1	0	-.00046

Table I (*continued*)

l	l′	F	D	Longitude	Parallax
4	1	2	0	.00055	
4	1	-2	1	-.00001	
4	1	2	2	.00004	
4	1	2	-4	-.00004	.000001
4	1	2	-2	.00036	-.000002
4	1	-2	0	.00014	.000002
4	1	-2	2	.00008	.000001
4	1	-2	-8	.00001	
4	1	-2	-6	.00002	-.000001
4	1	-2	-2	.00002	
4	2	0	0	-.00015	-.000003
4	2	0	1	-.00001	
4	2	0	2	.00001	
4	2	0	-8	-.00006	.000001
4	2	0	-6	-.00014	.000001
4	2	0	-4	.00002	
4	2	0	-3	.00001	
4	2	0	-2	-.00088	-.000013
4	2	2	-2	.00001	
4	3	0	-6	-.00001	
4	3	0	-2	-.00003	
4	-3	0	0	.00003	.000001
4	-3	0	2	.00002	.000001
4	-3	0	-2	.00001	
4	-2	0	0	.00119	.000024
4	-2	0	1	-.00001	
4	-2	0	2	.00045	.000011
4	-2	0	4	.00003	.000001
4	-2	0	-8	.00001	
4	-2	0	-6	.00006	-.000001
4	-2	0	-4	.00005	
4	-2	0	-3	.00002	
4	-2	0	-2	.00049	.000006
4	-2	0	-1	-.00004	-.000001
4	-2	2	0	-.00002	
4	-2	2	2	-.00001	
4	-2	-2	2	-.00001	
4	-1	0	0	.04714	.000964
4	-1	0	1	-.00014	-.000003
4	-1	0	2	.00732	.000187
4	-1	0	3	-.00001	
4	-1	0	4	.00032	.000010
4	-1	0	6	.00001	
4	-1	0	-8	.00007	-.000001
4	-1	0	-7	.00001	
4	-1	0	-6	-.00028	.000003
4	-1	0	-5	.00006	
4	-1	0	-4	-.00064	-.000001
4	-1	0	-3	.00059	.000005
4	-1	0	-2	-.01823	-.000244
4	-1	0	-1	-.00156	-.000027
4	-1	2	0	-.00065	
4	-1	2	2	-.00012	
4	-1	2	4	-.00001	
4	-1	2	-2	.00020	-.000001

l	l′	F	D	Latitude
5	1	1	1	.00001
5	1	1	2	-.00003
5	1	1	-4	.00009
5	1	1	-2	-.00029
5	1	-1	0	-.00015
5	1	-1	2	-.00003
5	1	-1	-2	-.00006
5	2	1	-2	-.00001
5	-2	1	0	.00002
5	-2	1	2	.00001
5	-1	1	0	.00054
5	-1	1	2	.00010
5	-1	1	4	.00001
5	-1	1	-4	.00001
5	-1	1	-3	.00001
5	-1	1	-2	-.00028
5	-1	1	-1	-.00001
5	-1	-1	0	.00014
5	-1	-1	2	.00006
5	-1	-1	-2	-.00005
6	0	1	0	.00120
6	0	1	2	.00008
6	0	1	-4	.00015
6	0	1	-2	-.00092
6	0	1	-1	.00001
6	0	3	0	-.00001
6	0	-1	0	.00036
6	0	-1	2	.00005
6	0	-1	-4	.00001
6	0	-1	-2	-.00020
6	1	1	0	-.00004
6	1	1	-4	.00001
6	1	1	-2	-.00002
6	1	-1	0	-.00001
6	-1	1	0	.00004
6	-1	1	2	.00001
6	-1	1	-2	-.00003
6	-1	-1	0	.00001
6	-1	-1	-2	-.00001
7	0	1	0	.00008
7	0	1	2	.00001
7	0	1	-4	.00002
7	0	1	-2	-.00007
7	0	-1	0	.00002
7	0	-1	-2	-.00002
8	0	1	0	.00001

Table I (*continued*)

l	l′	F	D	Longitude	Parallax
4	-1	2	-1	.00001	
4	-1	-2	0	-.00007	-.000001
4	-1	-2	2	-.00019	-.000003
4	-1	-2	4	-.00001	
4	-1	-2	-4	.00001	
4	-1	-2	-2	.00002	
5	0	0	0	.11100	.002634
5	0	0	1	-.00020	-.000005
5	0	0	2	.00568	.000162
5	0	0	3	-.00001	
5	0	0	4	.00018	.000006
5	0	0	-10	-.00004	.000001
5	0	0	-8	-.00018	.000003
5	0	0	-7	.00001	
5	0	0	-6	-.00019	.000001
5	0	0	-4	.00431	.000040
5	0	0	-3	.00005	.000001
5	0	0	-2	-.06850	-.001194
5	0	0	-1	.00072	.000015
5	0	2	0	-.00201	
5	0	2	2	-.00012	
5	0	2	-4	-.00010	.000002
5	0	2	-2	.00111	-.000006
5	0	2	-1	-.00001	
5	0	4	0	.00002	
5	0	4	-2	-.00001	
5	0	-2	0	-.00023	-.000003
5	0	-2	2	-.00018	-.000004
5	0	-2	4	-.00001	
5	0	-2	-2	.00006	
5	1	0	0	-.00287	-.000069
5	1	0	1	.00004	.000001
5	1	0	2	-.00020	-.000006
5	1	0	4	-.00001	
5	1	0	-10	-.00001	
5	1	0	-8	-.00003	
5	1	0	-6	-.00002	
5	1	0	-4	.00034	.000003
5	1	0	-3	.00001	
5	1	0	-2	-.00178	-.000032
5	1	0	-1	-.00002	
5	1	2	0	.00005	
5	1	2	-4	-.00001	
5	1	2	-2	.00003	
5	1	-2	0	.00001	
5	1	-2	2	.00001	
5	2	0	-4	.00002	
5	2	0	-2	-.00005	-.000001
5	-2	0	0	.00009	.000002
5	-2	0	2	.00004	.000001
5	-2	0	-2	.00002	
5	-1	0	0	.00333	.000079
5	-1	0	1	-.00001	
5	-1	0	2	.00057	.000016
5	-1	0	4	.00003	.000001

Table I (*continued*)

l	l′	F	D	Longitude	Parallax
5	-1	0	-6	-.00001	
5	-1	0	-4	.00004	
5	-1	0	-3	.00006	.000001
5	-1	0	-2	-.00173	-.000030
5	-1	0	-1	-.00011	-.000002
5	-1	2	0	-.00006	
5	-1	2	2	-.00001	
5	-1	2	-2	.00003	
5	-1	-2	2	-.00001	
6	0	0	0	.00665	.000177
6	0	0	1	-.00001	
6	0	0	2	.00041	.000013
6	0	0	4	.00002	.000001
6	0	0	-4	.00062	.000009
6	0	0	-2	-.00497	-.000103
6	0	0	-1	.00005	.000001
6	0	2	0	-.00015	
6	0	2	2	-.00001	
6	0	2	-4	-.00001	
6	0	2	-2	.00010	
6	0	-2	0	-.00001	
6	0	-2	2	-.00001	
6	0	-2	-2	.00001	
6	1	0	0	-.00021	-.000006
6	1	0	2	-.00002	-.000001
6	1	0	-4	.00004	.000001
6	1	0	-2	-.00010	-.000002
6	-2	0	0	.00001	
6	-1	0	0	.00024	.000006
6	-1	0	2	.00004	.000001
6	-1	0	-4	.00001	
6	-1	0	-3	.00001	
6	-1	0	-2	-.00016	-.000003
6	-1	0	-1	-.00001	
6	-1	2	0	-.00001	
7	0	0	0	.00041	.000012
7	0	0	2	.00003	.000001
7	0	0	-4	.00007	.000001
7	0	0	-2	-.00036	-.000009
7	0	2	0	-.00001	
7	0	2	-2	.00001	
7	1	0	0	-.00002	
7	1	0	-2	-.00001	
7	-1	0	0	.00002	
7	-1	0	-2	-.00001	
8	0	0	0	.00003	.000001
8	0	0	-4	.00001	