List of Lunar Eclipses between 1500 BC and 1000 BC

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Abstract

In order to contribute to the identification of ancient records of lunar eclipses a list of lunar eclipses between 1500 BC and 1000 BC is presented.

1. Introduction

A list of lunar eclipses between 1500 BC and 1000 BC is provided in this paper.

The Yīn (殷) Dynasty, which is also called the Shāng (商) Dynasty, was the second historic Chinese dynasty. It was founded ca. the 17th century BC and ended in the 11th century BC.

The oracle bone script (甲骨文字) contains the oldest Chinese characters on oracle bones, which are animal bones or tortoise carapaces. A majority of such bones were found in the Ruins of Yīn (殷墟 , Yīnxū), which was the capital of the last half of the Yīn Dynasty, but a few of them were also found in Zhèngzhōu (鄭 州) and date to earlier in the dynasty around the 15th century BC. Records of eclipses are included in oracle bone scripts.

The *Canon of Eclipses* by Oppolzer (1887) is usually used to identify the eclipses recorded in ancient times, but it contains only the solar eclipses from –1207 Nov. 10 and the lunar eclipses from –1206 Apr. 21 (note that since 1 BC is denoted as the year 0, year numbers with minus signs and the usual BC years differ by 1 year, e.g. –1207 = 1208 BC), and therefore it cannot be used for the identification of all the records from the Yīn Dynasty. Stephenson and Houlden (1986) published maps for all the central solar eclipses that occurred in East Asia after 1500 BC but they did not give the data of lunar eclipses. Neugebauer and Hiller (1934) gave a list of lunar eclipses between 3450 BC and 1 BC, but the list was limited to those seen in the Near East and Egypt and so it is not usable for the records in China.

This paper provides a list of lunar eclipses between 1500 BC and 1000 BC in order to contribute to the identification of records of lunar eclipses in that period. Although Oppolzer's Canon contains lunar eclipses from 1207 BC, as Pogo (1938) pointed out, it contains some errors in its indica-

tions of times of lunar eclipses and also needs its selection of some lunar eclipses corrected. For this reason I have decided to give all the lunar eclipses until 1000 BC using unified lunar and solar ephemerides in order to guarantee the identification of the records of lunar eclipses for the entire Yīn Dynasty as well as for the same period throughout the world.

2. Calculations

The calculations of lunar eclipses follow the procedures given in Chapter 8 of *Explanatory Supplement to the Astronomical Almanac* (Fiala & Bangert 1992). Specifically the corrections $\Delta\lambda = +0.''50$ and $\Delta\beta = –0.''25$ to the Moon's ecliptic longitude and latitude are applied to allow for the difference between the center of figure and the center of mass of the Moon, and the value $k = 0.2725076$ is used for the ratio of the Moon's radius to the equatorial radius of the Earth. When calculating the radius of the shadow of the Earth, the Earth is treated as a sphere having the mean radius of the Earth but the radius of the shadow is increased by one fiftieth at the distance of the Moon to take into account the effect of the Earth's atmosphere. The ephemeris used is the JPL lunar and planetary ephemeris DE406. This ephemeris covers the interval 3000 BC to 3000 AD, and is consistent with DE405 (Standish 1998), which is the ephemeris presently adopted in *The Astronomical Almanac* and which covers the interval 1600 AD to 2200 AD.

In order to calculate the local circumstances of solar and lunar eclipses one needs the value of $\Delta T = TT – UT$, where TT is Terrestrial Time, which is a uniform time and which serves as the time argument in dynamical theories, and UT is Universal Time, which expresses the rotation angle of the Earth. Using the value of ΔT corresponds to taking into account the variation in the rate of the Earth's rotation.

For their solar eclipse calculations Stephenson & Houlden (1986) used the following expressions for ΔT :

$$\Delta T = 22.5t_1^2 \text{ (sec)} \quad \text{between AD 948 and AD 1600,}$$
$$\Delta T = 1830 - 405t_2 + 46.5t_2^2 \text{ (sec)} \quad \text{before AD 948,} \tag{1}$$

where t_1 is the time measured in centuries from AD 1850 and t_2 is in centuries from AD 948. These expressions were based on the analyses of historical eclipses by Stephenson and Morrison (1984). They estimated the standard errors of these expressions as $1^m 20^s$ at AD 948, 7^m at 390 BC, and 15^m at 1500 BC.

Later, using the more extensive historical solar and lunar eclipses after 721 BC, Stephenson (1997) obtained the following parabolic expression as a remarkably good fit to most of the data:

$$\Delta T = 31t^2 - 20 \text{ (sec)}, \tag{2}$$

where t is the time measured in centuries from AD 1820. Stephenson noted that there are periods when the ΔT values shown by the eclipse records differ from those calculated by Eq. (2) by about 500^s and he obtained cubic splines to express the ΔT curve to fit the eclipse records after 721 BC. Sôma et al. (2003) and Tanikawa and Sôma (2004) further noted that the ΔT values expressed by Stephenson's splines can differ from the most probable values derived from the eclipse records by 1000^s to 2000^s at around the epochs of 600 and 900. However, we do not know the true nature of the ΔT values for the periods before 1000 BC, and therefore we will use Eq. (2) (truncated to the multiples of 100^s) for an approximate expression of ΔT.

It should be noted that the differences for e.g. 700 BC of ΔT between the values obtained from Eqs. (1) and (2) differ by about 24^m, which means that the value calculated by Eq. (1) had an error of approximately that amount at that epoch. This 24^m error is much greater than the standard error of Eq. (1) Stephenson and Houlden (1986) quoted for the epoch 1500 BC. This fact clearly demonstrates the difficulty of estimating the true uncertainty of the ΔT values extrapolated to the past. Therefore, one should be aware that the ΔT values used in this paper for the epochs between 1500 BC and 1000 BC may be in error by as much as 1^h or more, and hence the times and locations of the lunar eclipses may be in error by corresponding amounts.

Let UT_A and λ_A be the Universal Time and the longitude calculated using ΔT_A, the assumed ΔT value, respectively, and let δT be the error of the assumed ΔT value (i.e. the correct relation between TT and UT is TT − UT = $\Delta T_A + \delta T$). Then the correct Universal Time UT and the longitude λ can be obtained by the relations:

$$UT = UT_A - \delta T, \tag{3}$$

and

$$\lambda = \lambda_A + 1.0027379 \, \delta T, \tag{4}$$

where the longitudes are positive to the east and negative to the west, and the times are converted to the angles by the relation $1° = 4^m$ in Eq. (4). If λ and λ_A are in degrees, and δT is in seconds of time, the relation between λ and δT becomes

$$\lambda = \lambda_A + 0.004178075 \, \delta T. \tag{5}$$

3. List of Lunar Eclipses between 1500 BC and 1000 BC

Table 1 lists the lunar eclipses between 1500 BC and 1000 BC. 'Date' is the date of the lunar eclipse in the Julian proleptic calendar. 'JD' is the Julian day number of the lunar eclipse date. '干支' (gānzhī) is explained below. 'UT' gives the Universal Time of the maximum magnitude of the lunar eclipse and 'Mag' is the maximum magnitude of the lunar eclipse in units of lunar diameter. The lunar eclipses having magnitudes of 1.000 or greater are total lunar eclipses, and the rest are partial lunar eclipses. The columns of 'Half-Dur' give half of the durations from the beginning of the partial eclipse to the end of the partial eclipse, and from the beginning of the total eclipse to the end of the total eclipse. The columns of 'Moon in zenith' give the longitude and latitude of the location where the Moon is seen in the zenith at the maximum magnitude of the lunar eclipse. The longitudes are positive to the east and negative to the west. The latitudes are positive to the north and negative to the south.

The days in China were usually specified according to a 60-day cycle called 干支 (gānzhī). In this system ten gān and twelve zhī are combined consecutively making 60 combinations in all. The days of the eclipse records in the Yīn Dynasty were also usually specified according to this gānzhī. The ten gān are 甲 (jiǎ, chia), 乙 (yǐ, i), 丙 (bǐng, ping), 丁 (dīng, ting), 戊 (wù, wu), 己 (jǐ, chi), 庚 (gēng, keng), 辛 (xīn, hsin), 壬 (rén, jen), and 癸 (guǐ, kuei), and the twelve zhī are 子 (zǐ, tzu), 丑 (chǒu, ch'ou), 寅 (yín, yin), 卯 (mǎo, mao), 辰 (chén, ch'en), 巳 (sì, szu), 午 (wǔ, wu), 未 (wèi, wei), 申 (shēn, shen), 酉 (yǒu, yu), 戌 (xū, hsu), and 亥 (hài, hai). In any particular cycle, the first day was 甲

子, the second 乙丑 , and so on until the 60th day 癸亥 was reached, after which a new cycle began. This 60-day cycle has continued probably without any interruption until today in China, and it is still in operation now in China and its surrounding countries.

In order to make the identification of lunar eclipses with Chinese records easier, the gānzhī of the date of each lunar eclipse is also given under the column heading '干支' in Table 1. Note, however, that if a lunar eclipse occurred in the later hours of a date in UT, the date in China can be the next day, and although the division of the days in those days in China is not clear, the gānzhī in the records can be that of the next day.

There are several ways to express Chinese terms in the Roman alphabet. In the past, the Wade–Giles system was commonly used, but in 1979 the system of Pīnyīn was adopted by the International Organization for Standardization (ISO) as the standard romanization for modern Chinese, and it is widely used today. In Pīnyīn the tones of the vowels are also indicated by accents above individual vowel letters. For each gān and zhī both Pīnyīn and Wade–Giles systems are given above in this order in the parentheses after each Chinese character.

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Table 1. Lunar Eclipses between 1500 BC and 1000 BC

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
-1499	7	17	1173746	己卯	21	28.5	34100	0.146	40.9	----	+ 37.4	-22.5
-1498	1	11	1173924	丁丑	5	38.6	34100	1.219	111.0	36.0	- 81.9	+23.3
-1498	7	7	1174101	甲戌	13	55.3	34100	1.446	105.1	44.0	+150.0	-23.6
-1498	12	31	1174278	辛未	8	8.7	34100	1.136	104.9	28.2	-120.7	+24.2
-1497	6	27	1174456	己巳	2	1.1	34100	0.864	95.4	----	- 32.2	-24.0
-1496	11	9	1174957	庚寅	21	54.0	34000	0.024	17.0	----	+ 29.6	+12.7
-1495	5	5	1175134	丁亥	17	41.8	34000	0.535	82.2	----	+ 93.4	-11.4
-1495	10	30	1175312	乙酉	11	43.7	34000	1.195	102.2	32.0	-178.0	+ 9.5
-1494	4	25	1175489	壬午	0	38.5	34000	1.700	111.1	50.8	- 10.2	- 8.2
-1494	10	19	1175666	己卯	19	33.2	34000	1.191	107.5	33.2	+ 64.7	+ 5.8
-1493	4	14	1175843	丙子	14	23.7	34000	0.361	63.1	----	+144.2	- 4.8
-1492	3	4	1176168	辛丑	23	39.3	34000	0.045	23.3	----	+ 10.0	+12.0
-1491	2	22	1176523	丙申	12	35.5	34000	1.313	106.8	39.8	+176.0	+14.9
-1491	8	17	1176699	壬辰	13	58.5	34000	1.099	99.3	23.5	+151.3	-18.3
-1490	2	11	1176877	庚寅	18	24.1	33900	0.992	103.7	----	+ 88.7	+17.6
-1490	8	7	1177054	丁亥	5	18.9	33900	1.329	101.3	38.7	- 79.3	-20.2
-1489	7	27	1177408	辛巳	21	53.8	33900	0.005	7.5	----	+ 31.4	-21.4
-1488	6	16	1177733	丙午	23	46.0	33900	0.270	59.6	----	+ 1.2	-23.3
-1488	12	10	1177910	癸卯	16	24.2	33900	1.272	101.5	36.2	+113.1	+22.2
-1487	6	6	1178088	辛丑	3	2.3	33900	1.638	117.5	52.1	- 48.2	-20.8
-1487	11	30	1178265	戊戌	7	46.1	33900	1.248	99.5	34.4	-118.1	+19.4
-1486	5	26	1178442	乙未	3	45.8	33900	0.626	88.3	----	- 58.8	-17.5
-1484	4	4	1179121	甲寅	14	34.5	33800	1.023	94.6	11.3	+142.8	- 1.0
-1484	9	28	1179298	辛亥	14	59.9	33800	0.928	103.0	----	+134.2	- 2.5
-1483	3	25	1179476	己酉	7	36.6	33800	1.417	103.3	42.5	-111.4	+ 3.8
-1483	9	17	1179652	乙巳	15	48.5	33800	1.419	112.2	45.4	+122.9	- 7.5
-1482	9	6	1180006	己亥	23	30.8	33800	0.175	46.5	----	+ 8.0	-12.3
-1481	7	29	1180332	乙丑	5	22.3	33700	0.046	23.1	----	- 80.5	-21.1
-1480	1	22	1180509	壬戌	13	22.2	33700	1.177	109.9	32.8	+163.3	+22.1
-1480	7	17	1180686	己未	21	32.9	33700	1.329	103.5	39.5	+ 36.3	-23.1
-1479	1	10	1180863	丙辰	16	21.6	33700	1.167	105.4	30.9	+117.4	+23.9
-1479	7	7	1181041	甲寅	9	8.7	33700	0.988	100.1	----	-138.4	-24.3
-1478	11	21	1181543	丙子	6	52.2	33700	0.022	16.1	----	-104.8	+16.3
-1477	5	17	1181720	癸酉	0	15.9	33700	0.382	71.0	----	-5.8	-14.8
-1477	11	10	1181897	庚午	20	27.5	33700	1.190	102.3	31.7	+ 50.9	+13.5
-1476	5	5	1182074	丁卯	7	45.3	33600	1.846	111.2	51.6	-117.8	-12.0
-1476	10	30	1182252	乙丑	3	52.1	33600	1.197	107.9	33.7	- 60.4	+10.1
-1475	4	24	1182428	辛酉	21	54.6	33600	0.496	72.3	----	+ 30.5	- 8.9
-1473	3	5	1183108	辛巳	20	14.8	33600	1.219	105.3	34.5	+ 60.8	+11.3
-1473	8	28	1183284	丁丑	22	5.0	33600	1.034	97.2	14.0	+ 29.7	-15.0

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1472	2	23	1183463	丙子	1	43.6	33600	1.078	106.6	22.5	− 21.3	+14.4
−1472	8	17	1183639	壬申	13	26.2	33600	1.407	102.4	41.8	+159.1	−17.5
−1471	8	7	1183994	丁卯	5	48.8	33500	0.088	32.5	----	− 87.0	−19.4
−1470	6	28	1184319	壬辰	6	40.3	33500	0.124	41.3	----	−101.8	−24.5
−1470	12	22	1184496	己丑	1	15.0	33500	1.270	101.3	36.0	− 18.4	+23.7
−1469	6	17	1184673	丙戌	9	29.6	33500	1.478	116.1	48.6	−144.7	−22.7
−1469	12	11	1184850	癸未	16	45.5	33500	1.249	99.5	34.5	+107.9	+21.6
−1468	6	5	1185027	庚辰	10	17.7	33500	0.787	96.2	----	−156.9	−20.1
−1466	4	15	1185706	己亥	22	12.9	33400	0.904	90.7	----	+ 27.0	− 5.3
−1466	10	9	1185883	丙申	22	51.8	33400	0.897	101.8	----	+ 15.5	+ 2.0
−1465	4	5	1186061	甲午	15	19.0	33400	1.532	105.0	46.0	+131.8	− 0.5
−1465	9	28	1186237	庚寅	23	49.7	33400	1.455	112.4	46.5	+ 1.9	− 3.2
−1464	3	25	1186416	己丑	5	26.9	33400	0.084	32.9	----	− 78.8	+ 4.3
−1464	9	17	1186592	乙酉	7	48.9	33400	0.222	51.9	----	−117.0	− 8.2
−1462	2	1	1187094	丁未	20	54.9	33400	1.120	108.4	27.5	+ 50.8	+20.0
−1462	7	29	1187272	乙巳	5	15.2	33400	1.222	101.6	33.7	− 78.6	−21.7
−1461	1	22	1187449	壬寅	0	27.3	33300	1.211	106.1	34.2	− 3.0	+22.7
−1461	7	18	1187626	己亥	16	19.3	33300	1.105	103.9	25.1	+114.7	−23.8
−1460	12	1	1188128	辛酉	15	51.6	33300	0.019	15.1	----	+120.9	+19.1
−1459	5	27	1188305	戊午	6	53.0	33300	0.231	56.3	----	−105.5	−17.7
−1459	11	21	1188483	丙辰	5	14.2	33300	1.189	102.5	31.8	− 80.6	+17.0
−1458	5	16	1188659	壬子	14	50.2	33300	1.743	110.7	51.0	+135.3	−15.4
−1458	11	10	1188837	庚戌	12	12.0	33300	1.198	108.1	33.8	+174.5	+14.1
−1457	5	6	1189014	丁未	5	21.6	33300	0.634	79.9	----	− 82.2	−12.7
−1455	3	16	1189694	丁卯	3	45.2	33200	1.114	103.1	25.8	− 52.6	+ 7.3
−1455	9	8	1189870	癸亥	6	20.3	33200	0.981	95.3	----	− 94.5	−11.2
−1454	3	5	1190048	辛酉	8	56.2	33200	1.177	109.4	32.8	−129.9	+10.7
−1454	8	28	1190224	丁巳	21	43.3	33200	1.472	103.3	43.9	+ 34.8	−14.3
−1453	8	18	1190579	壬子	13	49.1	33200	0.161	43.5	----	+153.1	−16.8
−1451	1	1	1191081	甲戌	9	59.3	33100	1.256	100.8	35.2	−148.1	+24.2
−1451	6	27	1191258	辛未	16	2.3	33100	1.327	113.8	42.6	+117.7	−23.8
−1451	12	22	1191436	己巳	1	40.5	33100	1.257	99.8	34.9	− 24.7	+23.0
−1450	6	16	1191612	乙丑	16	53.3	33100	0.943	102.2	----	+104.4	−22.0
−1448	4	26	1192292	乙酉	5	44.0	33100	0.775	85.8	----	− 86.9	− 9.4
−1448	10	20	1192469	壬午	6	50.4	33100	0.879	101.0	----	−104.7	+ 6.5
−1447	4	15	1192646	己卯	22	53.3	33100	1.655	106.3	48.6	+ 17.1	− 4.8
−1447	10	9	1192823	丙子	7	57.8	33100	1.480	112.4	47.1	−120.7	+ 1.3
−1446	4	5	1193001	甲戌	12	49.3	33000	0.195	49.6	----	+169.4	0.0
−1446	9	28	1193177	庚午	16	15.6	33000	0.257	55.4	----	+115.7	− 3.8
−1444	2	13	1193680	癸巳	4	21.7	33000	1.051	106.2	18.4	− 60.6	+17.2

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1444	8	8	1193857	庚寅	13	5.5	33000	1.127	99.6	26.3	+164.2	−19.6
−1443	2	1	1194034	丁亥	8	24.5	33000	1.267	107.0	37.6	−121.5	+20.7
−1443	7	28	1194211	甲申	23	35.2	33000	1.210	106.8	34.4	+ 6.4	−22.4
−1442	1	21	1194388	辛巳	19	34.4	33000	0.035	20.7	----	+ 70.3	+23.4
−1442	12	13	1194714	丁未	0	48.2	32900	0.012	12.2	----	− 12.4	+21.3
−1441	6	7	1194890	癸卯	13	33.5	32900	0.084	34.6	----	+154.4	−20.1
−1441	12	2	1195068	辛丑	13	58.4	32900	1.185	102.7	31.5	+149.0	+19.8
−1440	5	26	1195244	丁酉	21	58.6	32900	1.601	109.4	48.9	+ 27.9	−18.3
−1440	11	20	1195422	乙未	20	33.3	32900	1.199	108.4	33.9	+ 49.4	+17.6
−1439	5	16	1195599	壬辰	12	49.9	32900	0.774	86.2	----	+165.1	−16.1
−1437	3	27	1196279	壬子	11	2.6	32900	0.993	99.9	----	−163.0	+ 3.2
−1437	9	19	1196455	戊申	14	45.7	32800	0.942	93.8	----	+138.6	− 7.1
−1436	3	15	1196633	丙午	15	56.8	32800	1.292	112.2	40.5	+124.2	+ 6.8
−1436	9	8	1196810	癸卯	6	9.5	32800	1.524	103.8	45.3	− 92.1	−10.5
−1435	8	28	1197164	丁酉	21	59.3	32800	0.220	50.5	----	+ 30.5	−13.5
−1433	1	12	1197666	己未	18	38.2	32800	1.236	100.3	34.0	+ 83.5	+23.8
−1433	7	8	1197843	丙辰	22	36.8	32800	1.180	110.7	33.4	+ 19.8	−24.2
−1432	1	2	1198021	甲寅	10	29.0	32800	1.272	100.1	35.8	−155.5	+23.5
−1432	6	26	1198197	庚戌	23	32.8	32800	1.093	106.7	24.3	+ 5.0	−23.2
−1430	5	7	1198877	庚午	13	16.4	32700	0.645	79.9	----	+159.1	−13.3
−1430	10	31	1199054	丁卯	14	54.6	32700	0.868	100.5	----	+133.9	+10.7
−1429	4	27	1199232	乙丑	6	23.8	32700	1.785	107.1	50.1	− 96.6	− 8.9
−1429	10	20	1199408	辛酉	16	14.9	32700	1.496	112.3	47.4	+114.4	+ 5.8
−1428	4	15	1199586	己未	20	1.6	32700	0.318	62.4	----	+ 60.2	− 4.3
−1428	10	9	1199763	丙辰	0	48.7	32700	0.281	57.6	----	− 13.3	+ 0.7
−1426	2	23	1200265	戊寅	11	39.5	32600	0.969	103.4	----	−170.2	+13.9
−1426	8	19	1200442	乙亥	21	2.5	32600	1.043	97.6	15.7	+ 45.1	−16.7
−1425	2	12	1200619	壬申	16	15.9	32600	1.336	108.0	41.1	+121.0	+17.9
−1425	8	9	1200797	庚午	6	58.5	32600	1.303	109.0	40.1	−104.0	−20.2
−1424	2	2	1200974	丁卯	3	55.8	32600	0.088	32.6	----	− 54.3	+21.3
−1424	12	23	1201299	壬辰	9	39.6	32600	0.002	4.3	----	−144.1	+22.5
−1423	12	12	1201653	丙戌	22	38.3	32600	1.180	102.9	31.2	+ 19.9	+22.0
−1422	6	7	1201830	癸未	5	8.4	32600	1.461	107.6	45.3	− 79.6	−20.7
−1422	12	2	1202008	辛巳	4	54.0	32500	1.199	108.6	34.0	− 75.2	+20.5
−1421	5	27	1202184	丁丑	20	17.5	32500	0.916	91.3	----	+ 52.9	−19.1
−1419	4	6	1202864	丁酉	18	14.4	32500	0.863	95.7	----	+ 88.0	− 1.0
−1419	9	29	1203040	癸巳	23	17.5	32500	0.915	92.7	----	+ 10.1	− 2.7
−1418	3	26	1203218	辛卯	22	48.2	32500	1.418	114.5	46.3	+ 20.3	+ 2.6
−1418	9	19	1203395	戊子	14	40.7	32500	1.566	104.2	46.2	+139.5	− 6.3
−1417	3	15	1203572	乙酉	23	4.2	32500	0.051	27.6	----	+ 17.1	+ 6.3

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1417	9	9	1203750	癸未	6	16.7	32400	0.267	55.4	----	− 94.2	− 9.7
−1415	1	23	1204252	乙巳	3	10.3	32400	1.202	99.4	31.8	− 43.5	+22.4
−1415	7	19	1204429	壬寅	5	20.6	32400	1.045	107.0	17.5	− 80.4	−23.6
−1414	1	12	1204606	己亥	19	11.8	32400	1.298	100.7	37.2	+ 75.0	+23.1
−1414	7	8	1204783	丙申	6	21.2	32400	1.233	109.9	36.7	− 96.4	−23.5
−1412	5	17	1205462	乙卯	20	44.3	32400	0.510	72.5	----	+ 46.5	−16.8
−1412	11	10	1205639	壬子	23	3.0	32300	0.862	100.2	----	+ 11.7	+14.7
−1411	5	7	1205817	庚戌	13	50.5	32300	1.852	107.5	50.5	+150.8	−12.8
−1411	10	31	1205994	丁未	0	38.7	32300	1.504	112.1	47.5	− 12.0	+10.1
−1410	4	27	1206172	乙巳	3	9.6	32300	0.447	72.9	----	− 47.9	− 8.4
−1410	10	20	1206348	辛丑	9	30.0	32300	0.297	58.9	----	−144.2	+ 5.2
−1408	3	5	1206850	癸亥	18	47.2	32300	0.873	99.7	----	+ 82.3	+10.1
−1408	8	30	1207028	辛酉	5	5.4	32300	0.972	95.7	----	− 75.8	−13.3
−1407	2	22	1207204	丁巳	23	58.9	32300	1.416	109.0	44.3	+ 5.1	+14.5
−1407	8	19	1207382	乙卯	14	28.8	32200	1.385	110.8	43.8	+143.6	−17.4
−1406	2	12	1207559	壬子	12	10.7	32200	0.152	42.3	----	−177.6	+18.5
−1405	12	24	1208239	壬申	7	14.1	32200	1.167	102.9	30.3	−107.8	+23.2
−1404	6	17	1208415	戊辰	12	24.6	32200	1.326	105.1	39.9	+171.7	−22.4
−1404	12	12	1208593	丙寅	13	7.9	32200	1.206	109.0	34.6	+162.3	+22.6
−1403	6	7	1208770	癸亥	3	46.1	32200	1.054	95.5	17.1	− 59.2	−21.4
−1401	4	18	1209450	癸未	1	17.2	32100	0.721	89.9	----	− 18.8	− 5.2
−1401	10	11	1209626	己卯	7	59.1	32100	0.899	91.9	----	−121.0	+ 1.8
−1400	4	6	1209804	丁丑	5	30.7	32100	1.559	116.5	50.5	− 81.4	− 1.5
−1400	9	29	1209980	癸酉	23	22.1	32100	1.594	104.4	46.8	+ 8.5	− 2.0
−1399	3	26	1210158	辛未	5	54.3	32100	0.181	51.1	----	− 86.4	+ 2.2
−1399	9	19	1210335	戊辰	14	39.1	32100	0.303	58.9	----	+139.6	− 5.6
−1397	2	3	1210837	庚寅	11	34.6	32100	1.158	98.3	28.5	−168.9	+20.3
−1397	7	30	1211014	丁亥	12	10.6	32000	0.920	102.8	----	+177.7	−22.3
−1396	1	24	1211192	乙酉	3	48.0	32000	1.334	101.5	38.9	− 53.1	+21.7
−1396	7	18	1211368	辛巳	13	18.2	32000	1.362	112.1	43.5	+160.0	−23.0
−1395	7	7	1211722	乙亥	20	47.4	32000	0.042	23.4	----	+ 46.9	−22.9
−1394	5	29	1212048	辛丑	4	14.9	32000	0.376	63.5	----	− 66.4	−19.8
−1394	11	22	1212225	戊戌	7	10.5	32000	0.858	100.0	----	−109.9	+18.1
−1393	5	18	1212402	乙未	21	13.1	32000	1.713	107.3	49.6	+ 39.5	−16.3
−1393	11	11	1212579	壬辰	9	4.2	32000	1.508	111.8	47.5	−138.5	+14.0
−1392	5	7	1212757	庚寅	10	10.2	32000	0.584	81.8	----	−154.0	−12.2
−1392	10	30	1212933	丙戌	18	16.7	31900	0.306	59.5	----	+ 83.7	+ 9.4
−1390	3	17	1213436	己酉	1	49.1	31900	0.765	95.0	----	− 24.0	+ 6.0
−1390	9	10	1213613	丙午	13	17.9	31900	0.915	94.0	----	+160.6	− 9.4
−1389	3	6	1213790	癸卯	7	34.7	31900	1.512	110.0	47.2	−109.4	+10.8

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y	M	d			h	m	s		m	m	o	o
−1389	8	30	1213967	庚子	22	5.4	31900	1.453	112.0	46.4	+ 29.3	−13.9
−1388	2	23	1214144	丁酉	20	15.3	31900	0.230	51.4	----	+ 61.1	+15.1
−1388	8	19	1214322	乙未	0	1.2	31900	0.072	32.8	----	+ 0.6	−18.0
−1386	1	3	1214824	丁巳	15	44.9	31800	1.148	102.8	28.8	+125.8	+23.5
−1386	6	28	1215000	癸丑	19	44.9	31800	1.196	102.2	32.3	+ 62.2	−23.3
−1386	12	23	1215178	辛亥	21	20.1	31800	1.218	109.5	35.5	+ 40.5	+23.8
−1385	6	18	1215355	戊申	11	18.3	31800	1.188	98.7	30.8	−171.9	−23.1
−1383	4	28	1216035	戊辰	8	13.6	31800	0.574	82.5	----	−124.0	− 9.1
−1383	10	21	1216211	甲子	16	43.5	31800	0.888	91.3	----	+107.3	+ 6.2
−1382	4	17	1216389	壬戌	12	6.5	31800	1.706	117.7	52.9	+178.5	− 5.7
−1382	10	11	1216566	己未	8	9.2	31700	1.614	104.6	47.1	−123.9	+ 2.5
−1381	4	6	1216743	丙辰	12	36.8	31700	0.324	66.8	----	+171.8	− 2.0
−1381	9	30	1216920	癸丑	23	10.5	31700	0.327	61.1	----	+ 11.1	− 1.2
−1379	2	13	1217422	乙亥	19	51.0	31700	1.098	96.7	22.9	+ 67.3	+17.5
−1379	8	9	1217599	壬申	19	9.4	31700	0.811	98.4	----	+ 73.5	−20.1
−1378	2	3	1217777	庚午	12	13.9	31700	1.383	102.4	41.0	−178.9	+19.6
−1378	7	29	1217953	丙寅	20	21.8	31700	1.480	113.5	47.7	+ 54.7	−21.7
−1377	1	24	1218132	乙丑	2	14.6	31700	0.015	14.0	----	− 29.9	+21.0
−1377	7	19	1218308	辛酉	4	11.8	31700	0.165	45.4	----	− 63.5	−22.4
−1376	6	8	1218633	丙戌	11	45.8	31600	0.242	51.9	----	−179.0	−22.2
−1376	12	2	1218810	癸未	15	20.7	31600	0.855	99.7	----	+128.3	+20.9
−1375	5	29	1218988	辛巳	4	36.0	31600	1.572	106.5	47.4	− 71.5	−19.3
−1375	11	21	1219164	丁丑	17	33.9	31600	1.510	111.6	47.5	+ 94.4	+17.4
−1374	5	18	1219342	乙亥	17	9.4	31600	0.723	89.3	----	+100.6	−15.7
−1374	11	11	1219519	壬申	3	5.7	31600	0.309	59.7	----	− 48.7	+13.4
−1372	3	27	1220021	甲午	8	42.7	31600	0.647	88.9	----	−128.5	+ 1.8
−1372	9	20	1220198	辛卯	21	35.2	31600	0.870	92.6	----	+ 35.7	− 5.2
−1371	3	16	1220375	戊子	15	5.1	31500	1.617	110.7	49.5	+137.2	+ 6.7
−1371	9	10	1220553	丙戌	5	51.3	31500	1.508	113.0	48.0	− 87.5	−10.0
−1370	3	6	1220730	癸未	4	15.0	31500	0.318	59.6	----	− 59.3	+11.3
−1370	8	30	1220907	庚辰	7	18.8	31500	0.150	46.9	----	−108.9	−14.6
−1368	1	15	1221410	癸卯	0	4.0	31500	1.116	102.3	25.8	+ 2.2	+22.8
−1368	7	9	1221586	己亥	3	11.3	31500	1.077	98.9	20.9	− 48.7	−23.4
−1367	1	3	1221764	丁酉	5	22.4	31500	1.240	110.3	37.1	− 78.7	+24.1
−1367	6	28	1221940	癸巳	18	53.4	31500	1.315	101.2	38.2	+ 75.0	−24.0
−1365	5	9	1222620	癸丑	15	4.1	31400	0.418	72.3	----	+132.6	−12.7
−1365	11	2	1222797	庚戌	1	36.1	31400	0.886	91.1	----	− 26.2	+10.4
−1364	4	27	1222974	丁未	18	36.8	31400	1.796	118.1	53.5	+ 80.0	− 9.6
−1364	10	21	1223151	甲辰	17	0.5	31400	1.625	104.7	47.3	+102.7	+ 6.9
−1363	4	16	1223328	辛丑	19	13.7	31400	0.473	78.8	----	+ 71.5	− 6.1

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y	M	d			h	m	s		m	m	o	o
−1363	10	11	1223506	己亥	7	46.4	31400	0.340	62.3	----	−118.6	+ 3.3
−1361	2	25	1224008	辛酉	4	1.3	31300	1.029	94.7	12.6	− 55.4	+14.1
−1361	8	21	1224185	戊午	2	18.3	31300	0.715	93.9	----	− 33.6	−17.2
−1360	2	14	1224362	乙卯	20	32.7	31300	1.444	103.5	43.3	+ 56.6	+16.7
−1360	8	9	1224539	壬子	3	38.1	31300	1.583	114.3	50.1	− 53.9	−19.6
−1359	2	3	1224717	庚戌	10	27.2	31300	0.058	27.3	----	−152.5	+18.8
−1359	7	29	1224893	丙午	11	47.2	31300	0.275	57.6	----	−176.8	−21.1
−1358	6	19	1225218	辛未	19	18.7	31300	0.113	36.1	----	+ 68.2	−23.9
−1358	12	13	1225395	戊辰	23	26.0	31300	0.847	99.3	----	+ 8.0	+23.0
−1357	6	9	1225573	丙寅	11	56.6	31300	1.431	105.0	43.6	+178.4	−21.6
−1357	12	3	1225750	癸亥	2	2.2	31300	1.513	111.3	47.5	− 32.1	+20.3
−1356	5	29	1225928	辛酉	0	6.1	31200	0.864	95.6	----	− 3.9	−18.6
−1356	11	21	1226104	丁巳	11	57.2	31200	0.313	59.9	----	+178.7	+16.8
−1354	4	7	1226606	己卯	15	31.5	31200	0.517	81.0	----	+128.1	− 2.6
−1354	10	2	1226784	丁丑	6	1.3	31200	0.836	91.6	----	− 91.5	− 0.7
−1353	3	27	1226960	癸酉	22	26.7	31200	1.735	111.1	51.0	+ 25.7	+ 2.4
−1353	9	21	1227138	辛未	13	43.4	31200	1.549	113.6	49.1	+153.8	− 5.8
−1352	3	16	1227315	戊辰	12	4.6	31200	0.419	67.3	----	−177.5	+ 7.2
−1352	9	9	1227492	乙丑	14	45.1	31200	0.212	55.4	----	+139.2	−10.7
−1350	1	25	1227995	戊子	8	17.6	31100	1.075	101.5	21.1	−120.3	+21.3
−1350	7	20	1228171	甲申	10	45.9	31100	0.966	95.3	----	−161.7	−22.6
−1349	1	14	1228349	壬午	13	19.3	31100	1.273	111.2	39.1	+163.3	+23.5
−1349	7	10	1228526	己卯	2	34.3	31100	1.436	103.0	43.0	− 39.5	−24.1
−1348	6	28	1228880	癸酉	19	28.2	31100	0.078	30.6	----	+ 66.2	−24.7
−1347	5	19	1229205	戊戌	21	51.5	31100	0.261	58.7	----	+ 30.2	−16.0
−1347	11	12	1229382	乙未	10	29.1	31100	0.888	90.9	----	−159.5	+14.3
−1346	5	9	1229560	癸巳	1	3.7	31000	1.635	117.5	52.1	− 17.6	−13.3
−1346	11	2	1229737	庚寅	1	57.0	31000	1.631	104.7	47.4	− 31.7	+11.2
−1345	4	28	1229914	丁亥	1	48.1	31000	0.630	88.5	----	− 28.1	−10.0
−1345	10	22	1230091	甲申	16	28.6	31000	0.345	63.0	----	+110.3	+ 7.7
−1343	3	7	1230593	丙午	12	1.5	31000	0.945	92.1	----	−176.0	+10.3
−1343	8	31	1230770	癸卯	9	35.6	31000	0.633	89.6	----	−143.1	−13.8
−1342	2	25	1230948	辛丑	4	41.0	31000	1.518	104.6	45.5	− 65.7	+13.3
−1342	8	20	1231124	丁酉	11	3.0	31000	1.673	114.6	51.4	−165.0	−16.7
−1341	2	14	1231302	乙未	18	27.4	31000	0.115	38.3	----	+ 87.7	+16.0
−1341	8	9	1231478	辛卯	19	31.5	30900	0.373	65.9	----	+ 67.5	−18.9
−1340	12	24	1231981	甲寅	7	29.7	30900	0.834	98.6	----	−111.7	+24.1
−1339	6	19	1232158	辛亥	19	20.6	30900	1.294	103.0	37.9	+ 67.8	−23.3
−1339	12	13	1232335	戊申	10	32.0	30900	1.519	111.1	47.5	−158.5	+22.3
−1338	6	9	1232513	丙午	6	59.4	30900	1.006	100.9	6.3	−107.2	−21.0

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1338	12	2	1232689	壬寅	20	48.4	30900	0.316	60.0	----	+ 46.5	+19.6
−1336	4	17	1233191	甲子	22	15.2	30900	0.382	70.9	----	+ 26.1	− 6.8
−1336	10	12	1233369	壬戌	14	32.8	30800	0.813	90.9	----	+139.9	+ 3.8
−1335	4	7	1233546	己未	5	47.0	30800	1.859	111.0	51.5	− 85.5	− 1.9
−1335	10	1	1233723	丙辰	21	42.9	30800	1.581	114.2	49.8	+ 33.3	− 1.3
−1334	3	27	1233900	癸丑	19	51.0	30800	0.529	74.2	----	+ 64.8	+ 2.9
−1334	9	20	1234077	庚戌	22	21.4	30800	0.262	61.1	----	+ 24.5	− 6.5
−1332	2	5	1234580	癸酉	16	18.1	30800	1.019	100.2	10.7	+120.1	+18.9
−1332	7	30	1234756	己巳	18	28.6	30800	0.869	91.6	----	+ 83.1	−21.0
−1331	1	24	1234934	丁卯	21	3.6	30800	1.321	112.3	41.8	+ 48.2	+21.9
−1331	7	20	1235111	甲子	10	22.7	30700	1.546	104.3	46.0	−155.9	−23.3
−1330	1	13	1235288	辛酉	20	40.1	30700	0.025	19.6	----	+ 53.1	+24.1
−1330	7	10	1235466	己未	3	2.8	30700	0.192	47.4	----	− 46.7	−24.7
−1329	5	31	1235791	甲申	4	36.8	30700	0.102	37.6	----	− 71.4	−18.7
−1329	11	23	1235967	庚辰	19	26.2	30700	0.892	90.9	----	+ 66.5	+17.6
−1328	5	19	1236145	戊寅	7	25.8	30700	1.469	116.0	48.3	−113.6	−16.5
−1328	11	12	1236322	乙亥	10	55.2	30700	1.631	104.7	47.4	−166.3	+15.0
−1327	5	8	1236499	壬申	8	20.0	30700	0.790	96.2	----	−126.9	−13.7
−1327	11	2	1236677	庚午	1	12.6	30700	0.345	63.0	----	− 21.0	+11.9
−1325	3	18	1237178	辛卯	19	56.0	30600	0.849	88.7	----	+ 64.5	+ 6.3
−1325	9	11	1237355	戊子	17	4.1	30600	0.565	85.6	----	+104.4	− 9.9
−1324	3	7	1237533	丙戌	12	42.5	30600	1.605	105.7	47.6	+173.4	+ 9.6
−1324	8	30	1237709	壬午	18	40.4	30600	1.747	114.6	51.9	+ 80.5	−13.3
−1323	2	25	1237888	辛巳	2	19.3	30600	0.185	48.3	----	− 30.6	+12.6
−1323	8	20	1238064	丁丑	3	24.4	30600	0.457	71.8	----	− 50.7	−16.1
−1321	1	4	1238566	己亥	15	26.0	30600	0.812	97.6	----	+130.6	+24.3
−1321	7	1	1238744	丁酉	2	45.3	30600	1.161	100.4	29.3	− 42.8	−24.2
−1321	12	24	1238920	癸巳	18	57.1	30500	1.533	111.0	47.8	+ 76.4	+23.4
−1320	6	19	1239098	辛卯	13	55.7	30500	1.144	105.1	29.2	+149.0	−22.6
−1320	12	13	1239275	戊子	5	38.9	30500	0.324	60.5	----	− 85.2	+21.6
−1318	4	29	1239777	庚戌	4	57.2	30500	0.240	57.3	----	− 75.5	−10.9
−1318	10	23	1239954	丁未	23	8.1	30500	0.799	90.6	----	+ 10.6	+ 8.2
−1317	4	18	1240131	甲辰	12	59.6	30500	1.742	110.5	50.9	+165.2	− 6.2
−1317	10	13	1240309	壬寅	5	48.1	30500	1.600	114.5	50.2	− 88.7	+ 3.1
−1316	4	7	1240486	己亥	3	29.5	30500	0.649	80.5	----	− 51.0	− 1.4
−1316	10	1	1240663	丙申	6	4.8	30500	0.300	65.0	----	− 92.0	− 2.0
−1314	2	16	1241166	己未	0	11.8	30400	0.951	98.3	----	+ 1.8	+15.9
−1314	8	11	1241342	乙卯	2	20.2	30400	0.781	88.0	----	− 34.5	−18.7
−1313	2	5	1241520	癸丑	4	41.5	30400	1.380	113.6	44.5	− 65.6	+19.6
−1313	7	31	1241696	己酉	18	15.7	30400	1.645	105.1	47.9	+ 86.4	−21.6

Date			JD	干支	UT		ΔT	Mag	Half–Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1312	1	25	1241874	丁未	4	19.2	30400	0.076	33.8	----	− 60.6	+22.6
−1312	7	20	1242051	甲辰	10	42.2	30400	0.295	57.9	----	−160.7	−23.9
−1311	12	4	1242553	丙寅	4	20.2	30400	0.893	90.8	----	− 66.3	+20.3
−1310	5	30	1242730	癸亥	13	50.0	30300	1.305	113.4	41.6	+150.1	−19.2
−1310	11	23	1242907	庚申	19	55.3	30300	1.630	104.8	47.4	+ 59.0	+18.4
−1309	5	19	1243084	丁巳	14	52.0	30300	0.954	102.5	----	+134.6	−17.0
−1309	11	13	1243262	乙卯	10	0.4	30300	0.340	62.8	----	−152.9	+15.8
−1307	3	29	1243764	丁丑	3	42.2	30300	0.743	84.4	----	− 53.1	+ 2.1
−1307	9	22	1243941	甲戌	0	41.4	30300	0.514	82.2	----	− 10.5	− 5.7
−1306	3	18	1244118	辛未	20	33.3	30300	1.705	106.6	49.2	+ 54.8	+ 5.5
−1306	9	11	1244295	戊辰	2	26.5	30300	1.808	114.4	52.0	− 36.5	− 9.4
−1305	3	8	1244473	丙寅	10	0.9	30200	0.270	57.8	----	−146.5	+ 8.8
−1305	8	31	1244649	壬戌	11	29.0	30200	0.528	76.1	----	−172.0	−12.7
−1303	1	14	1245151	甲申	23	18.9	30200	0.781	96.1	----	+ 13.6	+23.6
−1303	7	11	1245329	壬午	10	14.9	30200	1.035	97.3	14.2	−154.4	−24.2
−1302	1	4	1245506	己卯	3	17.9	30200	1.554	110.9	48.2	− 47.5	+23.7
−1302	6	30	1245683	丙子	20	52.0	30200	1.279	108.5	38.8	+ 45.5	−23.5
−1302	12	24	1245860	癸酉	14	25.2	30200	0.336	61.5	----	+144.4	+22.8
−1300	5	9	1246362	乙未	11	39.4	30100	0.098	37.2	----	−176.8	−14.6
−1300	11	3	1246540	癸巳	7	46.9	30100	0.789	90.5	----	−119.4	+12.3
−1299	4	28	1246716	己丑	20	13.9	30100	1.611	109.4	49.0	+ 55.6	−10.2
−1299	10	23	1246894	丁亥	13	59.4	30100	1.612	114.9	50.4	+148.0	+ 7.5
−1298	4	18	1247071	甲申	11	5.5	30100	0.776	86.1	----	−166.1	− 5.6
−1298	10	12	1247248	辛巳	13	57.3	30100	0.327	67.6	----	+149.2	+ 2.4
−1296	2	27	1247751	甲辰	7	51.2	30100	0.866	95.6	----	−113.3	+12.4
−1296	8	21	1247927	庚子	10	21.6	30100	0.709	84.6	----	−154.8	−15.7
−1295	2	15	1248105	戊戌	12	6.3	30100	1.455	114.9	47.4	−176.7	+16.6
−1295	8	11	1248282	乙未	2	18.2	30000	1.732	105.5	49.0	− 33.9	−19.3
−1294	2	4	1248459	壬辰	11	51.8	30000	0.140	45.3	----	−173.1	+20.3
−1294	7	31	1248636	己丑	18	28.5	30000	0.389	65.7	----	+ 83.3	−22.2
−1293	12	15	1249138	辛亥	13	15.2	30000	0.893	90.7	----	+161.0	+22.2
−1292	6	9	1249315	戊申	20	13.1	30000	1.141	109.8	30.0	+ 54.4	−21.3
−1292	12	4	1249493	丙午	4	53.1	30000	1.631	104.9	47.4	− 74.7	+21.0
−1291	5	29	1249669	壬寅	21	25.0	30000	1.116	107.2	27.0	+ 36.2	−19.8
−1291	11	23	1249847	庚子	18	47.4	30000	0.333	62.4	----	+ 75.7	+19.1
−1289	4	9	1250349	壬戌	11	24.9	29900	0.627	79.0	----	−169.9	− 2.1
−1289	10	3	1250526	己未	8	28.6	29900	0.474	79.4	----	−128.0	− 1.3
−1288	3	29	1250704	丁巳	4	18.5	29900	1.815	107.2	50.2	− 62.5	+ 1.3
−1288	9	21	1250880	癸丑	10	25.0	29900	1.816	114.0	51.9	−156.7	− 5.2
−1287	3	18	1251058	辛亥	17	32.1	29900	0.366	66.6	----	+ 99.8	+ 4.8

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
-1287	9	10	1251234	丁未	19	40.8	29900	0.586	79.3	----	+ 64.6	- 8.8
-1285	1	26	1251737	庚午	7	0.8	29900	0.736	93.9	----	-100.9	+22.0
-1285	7	22	1251914	丁卯	17	48.2	29900	0.918	93.9	----	+ 93.0	-23.3
-1284	1	15	1252091	甲子	11	33.3	29800	1.588	110.9	48.9	-170.1	+22.9
-1284	7	11	1252269	壬戌	3	54.4	29800	1.405	111.0	44.7	- 59.4	-23.5
-1283	1	3	1252445	戊午	23	7.5	29800	0.359	63.1	----	+ 15.0	+23.0
-1282	11	14	1253125	戊寅	16	27.3	29800	0.786	90.6	----	+110.6	+16.1
-1281	5	10	1253302	乙亥	3	23.7	29800	1.473	107.6	45.6	- 52.7	-14.0
-1281	11	3	1253479	壬申	22	13.2	29800	1.617	115.1	50.6	+ 24.2	+11.7
-1280	4	28	1253656	己巳	18	36.4	29800	0.908	91.0	----	+ 80.1	- 9.7
-1280	10	22	1253833	丙寅	21	55.5	29800	0.344	69.2	----	+ 29.1	+ 6.8
-1278	3	9	1254336	己丑	15	24.0	29700	0.770	92.0	----	+132.8	+ 8.4
-1278	9	1	1254512	乙酉	18	32.9	29700	0.649	81.5	----	+ 82.1	-12.1
-1277	2	26	1254690	癸未	19	22.7	29700	1.544	116.1	49.9	+ 74.0	+13.0
-1277	8	22	1254867	庚辰	10	27.0	29700	1.806	105.7	49.5	-156.0	-16.2
-1276	2	15	1255044	丁丑	19	14.0	29700	0.218	55.8	----	+ 76.5	+17.3
-1276	8	11	1255222	乙亥	2	20.3	29700	0.471	71.6	----	- 34.3	-19.8
-1275	12	25	1255723	丙申	22	4.3	29700	0.886	90.3	----	+ 29.9	+23.2
-1274	6	21	1255901	甲午	2	40.4	29600	0.982	105.0	----	- 42.0	-22.7
-1274	12	15	1256078	辛卯	13	49.9	29600	1.636	105.0	47.6	+152.2	+22.9
-1273	6	10	1256255	戊子	4	2.3	29600	1.275	110.7	39.3	- 63.1	-21.9
-1273	12	5	1256433	丙戌	3	33.6	29600	0.328	62.2	----	- 55.0	+21.8
-1271	4	19	1256934	丁未	19	1.1	29600	0.504	72.1	----	+ 75.0	- 6.2
-1271	10	13	1257111	甲辰	16	22.4	29600	0.447	77.3	----	+112.9	+ 3.2
-1270	4	9	1257289	壬寅	11	54.6	29600	1.833	107.5	50.4	-177.7	- 2.9
-1270	10	2	1257465	戊戌	18	31.7	29600	1.783	113.7	51.7	+ 81.0	- 0.8
-1269	3	30	1257644	丁酉	0	52.4	29600	0.477	75.0	----	- 11.3	+ 0.6
-1269	9	22	1257820	癸巳	4	4.5	29500	0.631	81.4	----	- 61.9	- 4.6
-1267	2	5	1258322	乙卯	14	37.9	29500	0.681	90.9	----	+145.5	+19.6
-1267	8	2	1258500	癸丑	1	28.8	29500	0.810	90.1	----	- 21.6	-21.6
-1266	1	25	1258676	己酉	19	42.2	29500	1.630	111.0	49.6	+ 68.6	+21.4
-1266	7	22	1258854	丁未	10	58.6	29500	1.524	112.9	48.5	-164.8	-22.6
-1265	1	15	1259031	甲辰	7	43.6	29500	0.389	65.3	----	-112.8	+22.3
-1265	7	11	1259208	辛丑	13	35.5	29500	0.087	36.0	----	+155.2	-22.9
-1264	11	25	1259711	甲子	1	8.4	29400	0.783	90.7	----	- 19.3	+19.3
-1263	5	20	1259887	庚申	10	37.2	29400	1.336	105.2	40.3	-161.6	-17.3
-1263	11	14	1260065	戊午	6	29.7	29400	1.619	115.3	50.7	- 99.9	+15.5
-1262	5	10	1260242	乙卯	2	7.2	29400	1.045	95.2	15.7	- 33.4	-13.4
-1262	11	3	1260419	壬子	5	59.9	29400	0.355	70.1	----	- 92.3	+11.0
-1260	3	19	1260921	甲戌	22	43.6	29400	0.659	86.9	----	+ 22.0	+ 4.3

Date			JD	干支	UT		ΔT	Mag	Half–Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1260	9	12	1261098	辛未	2	52.6	29400	0.602	78.9	----	− 43.3	− 8.1
−1259	3	9	1261276	己巳	2	26.5	29400	1.649	117.2	52.0	− 32.6	+ 9.1
−1259	9	1	1261452	乙丑	18	44.4	29400	1.867	105.8	49.6	+ 79.4	−12.6
−1258	2	26	1261630	癸亥	2	28.8	29300	0.311	65.7	----	− 32.4	+13.7
−1258	8	22	1261807	庚申	10	20.2	29300	0.541	76.1	----	−154.2	−16.8
−1256	1	6	1262309	壬午	6	50.7	29300	0.871	89.7	----	−100.4	+23.2
−1256	7	1	1262486	己卯	9	10.7	29300	0.830	99.3	----	−139.0	−23.3
−1256	12	25	1262663	丙子	22	42.1	29300	1.644	105.2	47.8	+ 20.4	+23.8
−1255	6	20	1262840	癸酉	10	42.5	29300	1.428	113.1	46.2	−162.7	−23.3
−1255	12	15	1263018	辛未	12	16.1	29300	0.325	62.1	----	+175.5	+23.6
−1254	6	9	1263194	丁卯	18	38.1	29300	0.082	32.4	----	+ 77.8	−22.5
−1253	5	1	1263520	癸巳	2	35.2	29200	0.374	63.3	----	− 39.5	−10.1
−1253	10	25	1263697	庚寅	0	24.3	29200	0.428	75.8	----	− 8.1	+ 7.5
−1252	4	19	1263874	丁亥	19	27.5	29200	1.706	107.3	49.5	+ 68.0	− 7.0
−1252	10	13	1264051	甲申	2	47.4	29200	1.760	113.3	51.4	− 43.6	+ 3.6
−1251	4	9	1264229	壬午	8	7.7	29200	0.596	82.6	----	−121.3	− 3.6
−1251	10	2	1264405	戊寅	12	34.7	29200	0.664	82.9	----	+169.8	− 0.2
−1249	2	16	1264907	庚子	22	4.0	29200	0.610	86.9	----	+ 34.1	+16.6
−1249	8	13	1265085	戊戌	9	15.4	29200	0.716	86.3	----	−137.9	−19.2
−1248	2	6	1265262	乙未	3	42.0	29200	1.689	111.1	50.4	− 50.8	+19.0
−1248	8	1	1265439	壬辰	18	12.2	29100	1.630	114.1	50.8	+ 87.4	−21.0
−1247	1	25	1265616	己丑	16	14.4	29100	0.431	68.2	----	+120.3	+20.7
−1247	7	21	1265793	丙戌	20	20.2	29100	0.215	55.7	----	+ 54.7	−22.1
−1246	12	6	1266296	己酉	9	47.2	29100	0.780	90.8	----	−148.1	+21.9
−1245	5	31	1266472	乙巳	17	48.9	29100	1.196	102.1	32.3	+ 90.2	−20.2
−1245	11	25	1266650	癸卯	14	45.9	29100	1.620	115.6	50.7	+136.5	+18.7
−1244	5	20	1266827	庚子	9	35.5	29100	1.182	98.6	30.4	−146.1	−16.8
−1244	11	13	1267004	丁酉	14	5.5	29100	0.363	70.7	----	+146.3	+14.8
−1242	3	31	1267507	庚申	5	56.4	29000	0.536	80.3	----	− 87.4	0.0
−1242	9	23	1267683	丙辰	11	21.8	29000	0.567	76.8	----	−171.3	− 3.8
−1241	3	20	1267861	甲寅	9	23.2	29000	1.767	117.8	53.2	−137.7	+ 4.9
−1241	9	13	1268038	辛亥	3	11.5	29000	1.849	105.8	49.5	− 47.9	− 8.6
−1240	3	8	1268215	戊申	9	33.7	29000	0.418	74.7	----	−139.3	+ 9.8
−1240	9	1	1268392	乙巳	18	26.9	29000	0.598	79.5	----	+ 84.0	−13.1
−1238	1	16	1268894	丁卯	15	29.0	29000	0.847	88.7	----	+131.1	+22.3
−1238	7	12	1269071	甲子	15	47.2	29000	0.688	92.6	----	+122.6	−23.1
−1237	1	6	1269249	壬戌	7	28.9	28900	1.663	105.5	48.1	−110.0	+23.8
−1237	7	1	1269425	戊午	17	30.7	28900	1.574	114.5	50.1	+ 95.9	−23.9
−1237	12	26	1269603	丙辰	20	54.3	28900	0.330	62.7	----	+ 47.3	+24.5
−1236	6	20	1269780	癸丑	1	51.4	28900	0.225	52.6	----	− 30.0	−24.0

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1235	5	11	1270105	戊寅	10	5.5	28900	0.240	51.7	----	−152.9	−13.6
−1235	11	4	1270282	乙亥	8	30.8	28900	0.419	75.0	----	−129.9	+11.6
−1234	5	1	1270460	癸酉	2	51.9	28900	1.568	106.5	47.3	− 44.0	−10.8
−1234	10	24	1270636	己巳	11	9.8	28900	1.747	112.9	51.2	−169.7	+ 8.0
−1233	4	20	1270814	丁卯	15	12.8	28900	0.727	89.5	----	+131.4	− 7.6
−1233	10	13	1270990	癸亥	21	13.3	28900	0.686	83.7	----	+ 39.6	+ 4.3
−1231	2	27	1271493	丙戌	5	25.4	28800	0.529	81.8	----	− 76.5	+13.0
−1231	8	23	1271670	癸未	17	9.2	28800	0.631	82.4	----	+103.7	−16.1
−1230	2	16	1271847	庚辰	11	38.4	28800	1.757	111.1	51.0	−169.8	+16.0
−1230	8	13	1272025	戊寅	1	29.8	28800	1.726	114.9	52.0	− 21.8	−18.6
−1229	2	6	1272202	乙亥	0	36.0	28800	0.486	71.7	----	− 4.6	+18.3
−1229	8	2	1272379	壬申	3	11.3	28800	0.332	68.0	----	− 47.6	−20.4
−1228	12	16	1272881	甲午	18	20.6	28800	0.770	90.7	----	+ 84.7	+23.6
−1227	6	11	1273058	辛卯	1	5.4	28800	1.063	98.4	18.9	− 18.7	−22.3
−1227	12	5	1273235	戊子	23	1.2	28700	1.624	115.8	50.9	+ 13.5	+21.2
−1226	5	31	1273412	乙酉	17	5.1	28700	1.321	101.3	38.5	+101.3	−19.6
−1226	11	24	1273589	壬午	22	14.4	28700	0.369	71.3	----	+ 24.4	+18.0
−1224	4	10	1274092	乙巳	12	58.0	28700	0.401	71.1	----	+166.1	− 4.3
−1224	10	3	1274268	辛丑	19	58.9	28700	0.544	75.4	----	+ 58.8	+ 0.7
−1223	3	30	1274446	己亥	16	9.2	28700	1.756	118.0	53.2	+119.7	+ 0.6
−1223	9	23	1274623	丙申	11	44.6	28700	1.809	105.7	49.4	−176.8	− 4.3
−1222	3	19	1274800	癸巳	16	31.2	28700	0.537	83.0	----	+115.5	+ 5.6
−1222	9	13	1274978	辛卯	2	40.9	28700	0.642	82.0	----	− 40.0	− 9.1
−1220	1	28	1275480	癸丑	0	3.0	28600	0.813	87.3	----	+ 3.5	+20.5
−1220	7	22	1275656	己酉	22	32.4	28600	0.556	85.1	----	+ 21.9	−22.0
−1219	1	16	1275834	丁未	16	8.5	28600	1.690	105.8	48.6	+121.3	+22.9
−1219	7	12	1276011	甲辰	0	24.8	28600	1.710	115.1	52.1	− 6.9	−23.7
−1218	1	6	1276189	壬寅	5	25.7	28600	0.342	63.9	----	− 79.2	+24.5
−1218	7	1	1276365	戊戌	9	8.0	28600	0.362	65.2	----	−138.5	−24.6
−1217	5	22	1276690	癸亥	17	35.3	28600	0.105	34.9	----	+ 94.3	−16.7
−1217	11	15	1276867	庚申	16	39.2	28600	0.412	74.4	----	+108.0	+15.3
−1216	5	11	1277045	戊午	10	16.0	28500	1.429	105.1	43.6	−155.8	−14.4
−1216	11	3	1277221	甲寅	19	39.0	28500	1.743	112.6	51.1	+ 62.7	+12.1
−1215	4	30	1277399	壬子	22	14.6	28500	0.863	95.7	----	+ 25.0	−11.5
−1215	10	24	1277576	己酉	5	58.9	28500	0.701	84.2	----	− 92.4	+ 8.7
−1213	3	10	1278078	辛未	12	35.0	28500	0.431	74.8	----	+175.5	+ 9.2
−1213	9	4	1278256	己巳	1	10.3	28500	0.560	78.7	----	− 16.8	−12.5
−1212	2	27	1278432	乙丑	19	24.1	28500	1.841	111.0	51.3	+ 73.5	+12.5
−1212	8	23	1278610	癸亥	8	55.4	28500	1.809	115.3	52.4	−133.1	−15.5
−1211	2	16	1278787	庚申	8	49.9	28500	0.553	75.6	----	−127.9	+15.3

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1211	8	12	1278964	丁巳	10	12.4	28400	0.437	76.8	----	−152.6	−18.0
−1210	12	28	1279467	庚辰	2	51.9	28400	0.756	90.4	----	− 41.8	+24.4
−1209	6	22	1279643	丙子	8	26.9	28400	0.932	94.1	----	−128.6	−23.8
−1209	12	17	1279821	甲戌	7	11.4	28400	1.632	116.1	51.1	−108.0	+22.9
−1208	6	11	1279998	辛未	0	35.5	28400	1.456	103.3	43.7	− 11.2	−21.7
−1208	12	5	1280175	戊辰	6	22.0	28400	0.376	71.8	----	− 96.7	+20.5
−1207	5	31	1280352	乙丑	17	37.9	28400	0.080	31.0	----	+ 93.2	−19.0
−1206	4	21	1280677	庚寅	19	53.4	28400	0.259	58.5	----	+ 61.1	− 8.5
−1206	10	15	1280854	丁亥	4	42.1	28400	0.530	74.4	----	− 72.7	+ 5.2
−1205	4	10	1281031	甲申	22	49.1	28300	1.616	117.4	51.7	+ 18.5	− 3.7
−1205	10	4	1281208	辛巳	20	26.6	28300	1.781	105.6	49.2	+ 52.0	+ 0.2
−1204	3	29	1281385	戊寅	23	24.2	28300	0.666	90.3	----	+ 11.1	+ 1.3
−1204	9	23	1281563	丙子	11	3.1	28300	0.675	83.8	----	−166.2	− 4.8
−1202	2	7	1282065	戊戌	8	26.6	28300	0.765	85.3	----	−122.0	+17.9
−1202	8	3	1282242	乙未	5	24.3	28300	0.437	76.8	----	− 80.7	−20.1
−1201	1	28	1282420	癸巳	0	39.2	28300	1.730	106.2	49.1	− 5.5	+21.1
−1201	7	23	1282596	己丑	7	28.4	28300	1.832	115.0	52.5	−112.1	−22.7
−1200	1	17	1282774	丁亥	13	47.5	28300	0.367	66.1	----	+156.6	+23.5
−1200	7	11	1282950	癸未	16	34.4	28200	0.489	74.1	----	+110.7	−24.4
−1199	11	26	1283453	丙午	0	52.5	28200	0.410	74.1	----	− 14.9	+18.4
−1198	5	22	1283630	癸卯	17	34.2	28200	1.285	103.0	37.4	+ 94.2	−17.4
−1198	11	15	1283807	庚子	4	11.2	28200	1.743	112.3	51.0	− 65.3	+15.9
−1197	5	12	1283985	戊戌	5	8.1	28200	1.008	101.1	7.0	− 79.1	−15.0
−1197	11	4	1284161	甲午	14	48.6	28200	0.709	84.4	----	+135.0	+12.8
−1195	3	20	1284663	丙辰	19	39.8	28200	0.324	65.8	----	+ 68.4	+ 5.1
−1195	9	14	1284841	甲寅	9	19.2	28100	0.501	75.4	----	−139.6	− 8.4
−1194	3	10	1285018	辛亥	3	5.4	28100	1.788	110.7	51.1	− 42.5	+ 8.6
−1194	9	3	1285195	戊申	16	29.5	28100	1.781	115.5	52.3	+113.0	−11.9
−1193	2	27	1285372	乙巳	16	58.0	28100	0.632	79.7	----	+109.7	+11.8
−1193	8	23	1285549	壬寅	17	21.5	28100	0.527	83.3	----	+100.1	−15.0
−1191	1	7	1286052	乙丑	11	13.8	28100	0.732	89.5	----	−165.9	+24.2
−1191	7	2	1286228	辛酉	15	52.5	28100	0.808	89.2	----	+120.7	−24.4
−1191	12	27	1286406	己未	15	16.1	28100	1.649	116.4	51.4	+132.1	+23.7
−1190	6	22	1286583	丙辰	8	8.4	28100	1.588	104.7	47.0	−124.0	−23.1
−1190	12	16	1286760	癸丑	14	27.7	28000	0.390	72.9	----	+142.9	+22.3
−1189	6	12	1286938	辛亥	1	3.0	28000	0.209	49.3	----	− 18.0	−21.1
−1188	5	2	1287263	丙子	2	44.0	28000	0.108	38.8	----	− 42.5	−12.5
−1188	10	25	1287439	壬申	13	32.9	28000	0.524	73.9	----	+154.2	+ 9.5
−1187	4	21	1287617	庚午	5	21.1	28000	1.467	116.0	48.2	− 80.6	− 7.8
−1187	10	15	1287794	丁卯	5	13.5	28000	1.762	105.6	49.0	− 80.3	+ 4.7

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1186	4	10	1287971	甲子	6	8.5	28000	0.807	96.9	----	− 91.1	− 3.0
−1186	10	4	1288148	辛酉	19	31.2	28000	0.695	85.0	----	+ 66.1	− 0.3
−1184	2	18	1288650	癸未	16	43.0	28000	0.705	82.7	----	+113.9	+14.8
−1184	8	13	1288827	庚辰	12	27.7	27900	0.333	68.1	----	+173.7	−17.5
−1183	2	7	1289005	戊寅	9	5.0	27900	1.779	106.6	49.6	−131.5	+18.5
−1183	8	2	1289181	甲戌	14	41.8	27900	1.738	114.5	52.0	+140.0	−20.8
−1182	1	27	1289359	壬申	22	3.9	27900	0.400	68.9	----	+ 33.4	+21.7
−1182	7	23	1289536	己巳	0	6.4	27900	0.606	80.7	----	− 1.6	−23.3
−1181	12	7	1290038	辛卯	9	2.4	27900	0.406	73.7	----	−136.6	+20.9
−1180	6	2	1290216	己丑	0	52.8	27900	1.142	100.1	27.7	− 15.5	−20.0
−1180	11	25	1290392	乙酉	12	43.6	27900	1.743	112.0	50.9	+167.1	+19.0
−1179	5	22	1290570	癸未	11	59.6	27900	1.153	105.5	30.0	+177.6	−18.1
−1179	11	14	1290746	己卯	23	42.4	27800	0.714	84.4	----	+ 1.6	+16.5
−1177	4	1	1291249	壬寅	2	38.1	27800	0.205	53.1	----	− 37.3	+ 0.9
−1177	9	25	1291426	己亥	17	34.7	27800	0.455	72.6	----	+ 95.9	− 4.1
−1176	3	20	1291603	丙申	10	37.4	27800	1.687	110.0	50.1	−156.4	+ 4.5
−1176	9	14	1291781	甲午	0	11.3	27800	1.719	115.6	52.0	− 2.9	− 7.8
−1175	3	10	1291958	辛卯	0	57.0	27800	0.723	83.9	----	− 10.7	+ 7.9
−1175	9	3	1292135	戊子	0	39.4	27800	0.606	88.1	----	− 9.7	−11.4
−1173	1	18	1292637	庚戌	19	29.4	27700	0.697	88.2	----	+ 71.4	+23.1
−1173	7	13	1292813	丙午	23	26.0	27700	0.692	84.0	----	+ 8.1	−24.2
−1172	1	7	1292991	甲辰	23	16.2	27700	1.674	116.7	51.8	+ 13.4	+23.6
−1172	7	2	1293168	辛丑	15	47.1	27700	1.713	105.6	49.0	+122.0	−23.7
−1172	12	26	1293345	戊戌	22	28.4	27700	0.409	74.4	----	+ 23.9	+23.1
−1171	6	22	1293523	丙申	8	28.5	27700	0.334	61.4	----	−129.0	−22.5
−1170	11	5	1294024	丁巳	22	26.1	27700	0.524	73.8	----	+ 20.7	+13.6
−1169	5	2	1294202	乙卯	11	48.5	27700	1.311	113.6	41.9	−178.4	−11.8
−1169	10	26	1294379	壬子	14	4.8	27700	1.751	105.6	48.9	+146.4	+ 9.0
−1168	4	20	1294556	己酉	12	49.9	27700	0.955	102.4	----	+167.4	− 7.1
−1168	10	15	1294734	丁未	4	6.4	27600	0.707	85.8	----	− 63.4	+ 4.2
−1166	3	1	1295236	己巳	0	52.6	27600	0.632	79.2	----	− 8.9	+11.1
−1166	8	24	1295412	乙丑	19	39.5	27600	0.244	59.0	----	+ 65.6	−14.3
−1165	2	18	1295590	癸亥	17	17.7	27600	1.845	107.0	50.0	+105.4	+15.3
−1165	8	13	1295766	己未	22	4.8	27600	1.642	113.7	50.7	+ 29.5	−18.2
−1164	2	8	1295945	戊午	6	7.6	27600	0.448	72.7	----	− 87.0	+19.1
−1164	8	2	1296121	甲寅	7	46.9	27600	0.711	85.7	----	−116.2	−21.4
−1163	12	7	1296623	丙子	17	13.3	27500	0.400	73.1	----	+101.8	+22.4
−1162	6	13	1296801	甲戌	8	10.6	27500	0.996	96.3	----	−124.8	−21.8
−1162	12	6	1296977	庚午	21	19.5	27500	1.744	111.8	50.8	+ 38.9	+21.5
−1161	6	2	1297155	戊辰	18	49.9	27500	1.301	109.1	40.1	+ 75.0	−20.6

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1161	11	26	1297332	乙丑	8	36.1	27500	0.717	84.4	----	−131.3	+19.7
−1159	4	11	1297834	丁亥	9	31.6	27500	0.080	33.7	----	−141.8	− 3.3
−1159	10	6	1298012	乙酉	1	55.2	27500	0.419	70.2	----	− 29.9	+ 0.3
−1158	3	31	1298188	辛巳	18	5.1	27500	1.577	108.9	48.2	+ 90.6	+ 0.3
−1158	9	25	1298366	己卯	7	59.9	27500	1.669	115.5	51.5	−120.7	− 3.6
−1157	3	21	1298543	丙子	8	50.2	27400	0.826	88.0	----	−129.9	+ 3.8
−1157	9	14	1298720	癸酉	8	9.2	27400	0.669	91.6	----	−122.7	− 7.4
−1155	1	29	1299223	丙申	3	33.4	27400	0.649	86.0	----	− 48.8	+21.2
−1155	7	24	1299399	壬辰	7	5.9	27400	0.587	78.4	----	−106.2	−23.1
−1154	1	18	1299577	庚寅	7	5.2	27400	1.714	117.1	52.3	−102.8	+22.5
−1154	7	13	1299753	丙戌	23	29.0	27400	1.830	106.0	49.8	+ 7.2	−23.5
−1153	1	7	1299931	甲申	6	22.7	27400	0.440	76.7	----	− 93.4	+23.0
−1153	7	3	1300108	辛巳	15	56.9	27400	0.453	70.4	----	+119.5	−23.1
−1152	11	16	1300610	癸卯	7	24.8	27300	0.528	73.9	----	−113.8	+17.2
−1151	5	12	1300787	庚子	18	13.2	27300	1.149	110.0	30.7	+ 84.7	−15.4
−1151	11	5	1300964	丁酉	23	2.2	27300	1.748	105.7	48.9	+ 11.8	+13.1
−1150	5	1	1301141	甲午	19	28.7	27300	1.110	107.0	26.3	+ 66.7	−11.1
−1150	10	26	1301319	壬辰	12	45.0	27300	0.709	86.1	----	+166.5	+ 8.5
−1148	3	11	1301821	甲寅	8	54.0	27300	0.549	74.7	----	−130.0	+ 7.1
−1148	9	4	1301998	辛亥	3	0.0	27300	0.168	49.4	----	− 44.9	−10.6
−1147	3	1	1302176	己酉	1	23.6	27300	1.840	107.2	50.1	− 16.5	+11.6
−1147	8	24	1302352	乙巳	5	37.3	27300	1.559	112.6	49.0	− 83.7	−15.0
−1146	2	18	1302530	癸卯	14	3.4	27200	0.509	77.0	----	+154.1	+15.9
−1146	8	13	1302706	己亥	15	37.9	27200	0.804	89.4	----	+126.4	−18.9
−1145	12	29	1303209	壬戌	1	16.5	27200	0.385	71.7	----	− 17.8	+23.1
−1144	6	23	1303386	己未	15	30.4	27200	0.858	91.9	----	+125.8	−22.9
−1144	12	17	1303563	丙辰	5	51.2	27200	1.741	111.5	50.7	− 87.9	+23.1
−1143	6	13	1303741	甲寅	1	38.0	27200	1.448	111.9	46.4	− 26.8	−22.5
−1143	12	6	1303917	庚戌	17	29.3	27200	0.722	84.4	----	+ 96.3	+22.1
−1141	10	17	1304597	庚午	10	24.5	27100	0.395	68.6	----	−157.8	+ 4.8
−1140	4	11	1304774	丁卯	1	29.2	27100	1.456	107.2	45.0	− 21.5	− 3.9
−1140	10	5	1304951	甲子	15	57.1	27100	1.630	115.5	50.9	+119.3	+ 0.9
−1139	3	31	1305128	辛酉	16	35.8	27100	0.939	92.0	----	+112.6	− 0.4
−1139	9	24	1305305	戊午	15	46.5	27100	0.720	94.1	----	+122.4	− 3.1
−1137	2	9	1305808	辛巳	11	27.9	27100	0.588	82.9	----	−166.9	+18.5
−1137	8	4	1305984	丁丑	14	53.8	27100	0.492	72.7	----	+137.4	−21.2
−1136	1	29	1306162	乙亥	14	45.7	27100	1.765	117.4	52.8	+142.9	+20.6
−1136	7	24	1306339	壬申	7	17.3	27100	1.843	106.0	49.8	−109.2	−22.4
−1135	1	17	1306516	己巳	14	13.5	27000	0.480	79.5	----	+150.0	+21.9
−1135	7	13	1306693	丙寅	23	29.8	27000	0.566	77.5	----	+ 6.9	−22.8

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1134	11	27	1307195	戊子	16	21.5	27000	0.531	74.0	----	+112.6	+20.3
−1133	5	24	1307373	丙戌	0	35.2	27000	0.986	105.2	----	− 11.2	−18.6
−1133	11	17	1307550	癸未	7	59.1	27000	1.746	105.7	48.9	−122.3	+16.7
−1132	5	12	1307727	庚辰	2	6.2	27000	1.267	110.4	38.8	− 33.4	−14.7
−1132	11	5	1307904	丁丑	21	25.3	27000	0.708	86.3	----	+ 36.2	+12.5
−1130	3	22	1308406	己亥	16	46.1	27000	0.451	68.7	----	+111.0	+ 2.8
−1130	9	15	1308583	丙申	10	33.4	26900	0.108	40.0	----	−158.8	− 6.5
−1129	3	12	1308761	甲午	9	20.2	26900	1.750	107.2	49.8	−136.4	+ 7.6
−1129	9	4	1308937	庚寅	13	23.3	26900	1.492	111.5	47.2	+159.5	−11.3
−1128	2	29	1309115	戊子	21	46.2	26900	0.586	81.8	----	+ 38.0	+12.2
−1128	8	23	1309291	甲申	23	37.4	26900	0.883	92.2	----	+ 6.4	−15.6
−1126	1	8	1309794	丁未	9	16.7	26900	0.365	69.9	----	−136.6	+22.8
−1126	7	4	1309971	甲辰	22	51.1	26900	0.723	86.5	----	+ 16.2	−23.2
−1126	12	28	1310148	辛丑	14	20.1	26900	1.732	111.2	50.6	+146.2	+23.7
−1125	6	24	1310326	己亥	8	27.0	26900	1.591	113.8	50.2	−128.5	−23.6
−1125	12	18	1310503	丙申	2	22.7	26800	0.729	84.6	----	− 35.9	+23.8
−1124	6	12	1310680	癸巳	11	12.1	26800	0.133	44.3	----	−170.4	−23.1
−1123	10	27	1311182	乙卯	18	55.1	26800	0.377	67.4	----	+ 74.1	+ 9.0
−1122	4	22	1311359	壬子	8	47.9	26800	1.329	104.9	40.0	−132.2	− 7.9
−1122	10	16	1311536	己酉	23	58.6	26800	1.602	115.5	50.5	− 1.7	+ 5.3
−1121	4	12	1311714	丁未	0	16.0	26800	1.060	95.5	18.0	− 3.6	− 4.6
−1121	10	5	1311890	癸卯	23	32.1	26800	0.759	95.9	----	+ 5.3	+ 1.3
−1119	2	19	1312393	丙寅	19	11.5	26800	0.512	78.6	----	+ 77.2	+15.3
−1119	8	14	1312569	壬戌	22	51.8	26700	0.409	67.0	----	+ 18.1	−18.6
−1118	2	8	1312747	庚申	22	17.2	26700	1.807	117.7	53.0	+ 30.5	+18.0
−1118	8	4	1312924	丁巳	15	14.0	26700	1.743	105.7	49.2	+132.1	−20.5
−1117	1	28	1313101	甲寅	21	52.6	26700	0.536	83.1	----	+ 36.0	+20.1
−1117	7	25	1313279	壬子	7	6.8	26700	0.670	83.1	----	−106.7	−21.6
−1116	12	8	1313781	甲戌	1	18.0	26700	0.534	74.1	----	− 20.6	+22.6
−1115	6	3	1313958	辛未	6	56.6	26700	0.822	98.9	----	−106.6	−21.1
−1115	11	27	1314135	戊辰	16	57.4	26700	1.748	105.9	49.0	+103.7	+19.7
−1114	5	23	1314312	乙丑	8	41.8	26700	1.427	113.0	46.1	−132.7	−17.9
−1114	11	17	1314490	癸亥	6	10.1	26600	0.701	86.2	----	− 94.9	+16.1
−1113	5	12	1314666	己未	16	53.4	26600	0.075	31.0	----	+105.0	−14.1
−1112	4	2	1314992	乙酉	0	34.9	26600	0.345	61.1	----	− 7.4	− 1.5
−1112	9	25	1315168	辛巳	18	14.2	26600	0.062	30.3	----	+ 85.3	− 2.2
−1111	3	22	1315346	己卯	17	8.4	26600	1.650	107.0	48.7	+105.6	+ 3.3
−1111	9	14	1315522	乙亥	21	16.5	26600	1.437	110.5	45.4	+ 40.6	− 7.2
−1110	3	12	1315701	甲戌	5	19.7	26600	0.674	86.8	----	− 76.1	+ 8.1
−1110	9	4	1315877	庚午	7	46.2	26600	0.948	94.1	----	−116.1	−11.9

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1108	1	19	1316379	壬辰	17	9.1	26600	0.334	67.0	----	+106.3	+21.6
−1108	7	15	1316557	庚寅	6	18.3	26500	0.597	80.5	----	− 94.9	−22.7
−1107	1	7	1316733	丙戌	22	45.2	26500	1.715	110.8	50.4	+ 21.2	+23.5
−1107	7	4	1316911	甲申	15	20.6	26500	1.728	114.9	52.2	+128.8	−23.9
−1107	12	28	1317088	辛巳	11	10.1	26500	0.744	85.1	----	−166.3	+24.4
−1106	6	23	1317265	戊寅	17	38.6	26500	0.287	63.7	----	+ 93.5	−24.2
−1105	11	8	1317768	辛丑	3	29.4	26500	0.366	66.7	----	− 54.7	+13.0
−1104	5	2	1317944	丁酉	16	4.5	26500	1.196	102.0	32.2	+117.7	−11.7
−1104	10	27	1318122	乙未	8	5.9	26500	1.585	115.5	50.2	−123.9	+ 9.6
−1103	4	22	1318299	壬辰	7	50.9	26500	1.189	98.7	30.9	−118.3	− 8.7
−1103	10	16	1318476	己丑	7	25.6	26500	0.786	97.1	----	−113.7	+ 5.7
−1101	3	3	1318979	壬子	2	45.9	26400	0.422	72.6	----	− 36.8	+11.6
−1101	8	26	1319155	戊申	6	57.3	26400	0.339	61.4	----	−103.3	−15.3
−1100	2	20	1319333	丙午	5	38.3	26400	1.729	117.7	52.8	− 79.8	+14.7
−1100	8	14	1319509	壬寅	23	15.6	26400	1.654	105.1	48.0	+ 11.9	−17.8
−1099	2	8	1319687	庚子	5	25.6	26400	0.602	87.0	----	− 76.9	+17.5
−1099	8	4	1319864	丁酉	14	49.0	26400	0.764	87.6	----	+138.1	−19.7
−1098	12	19	1320366	己未	10	11.4	26400	0.531	73.8	----	−152.7	+24.1
−1097	6	14	1320543	丙辰	13	22.9	26300	0.663	91.3	----	+157.1	−23.1
−109	12	9	1320721	甲寅	1	54.2	26300	1.745	106.0	49.0	− 29.6	+22.0
−1096	6	2	1320897	庚戌	15	23.3	26300	1.583	114.5	50.3	+126.8	−20.5
−1096	11	27	1321075	戊申	14	52.3	26300	0.695	86.1	----	+135.1	+19.1
−1095	5	23	1321252	乙巳	0	0.9	26300	0.224	52.4	----	− 2.4	−17.2
−1094	4	13	1321577	庚午	8	15.0	26300	0.228	50.5	----	−123.6	− 5.8
−1094	10	7	1321754	丁卯	2	4.9	26300	0.030	21.2	----	− 33.1	+ 2.3
−1093	4	3	1321932	乙丑	0	46.6	26300	1.536	106.2	46.6	− 10.1	− 1.0
−1093	9	26	1322108	辛酉	5	21.4	26300	1.398	109.6	43.9	− 81.3	− 2.8
−1092	3	22	1322286	己未	12	43.0	26300	0.776	91.9	----	+172.1	+ 3.9
−1092	9	14	1322462	乙卯	16	4.0	26300	1.000	95.6	----	+118.9	− 7.8
−1090	1	30	1322965	戊寅	0	56.4	26200	0.291	62.9	----	− 9.8	+19.6
−1090	7	26	1323142	乙亥	13	47.7	26200	0.479	73.7	----	+153.2	−21.3
−1089	1	19	1323319	壬申	7	3.7	26200	1.689	110.5	50.1	−102.3	+22.3
−1089	7	15	1323496	己巳	22	16.5	26200	1.824	115.4	52.7	+ 25.5	−23.3
−1088	1	8	1323673	丙寅	19	52.6	26200	0.766	85.9	----	+ 64.4	+24.1
−1088	7	4	1323851	甲子	0	10.6	26200	0.433	76.5	----	− 3.8	−24.5
−1087	11	18	1324353	丙戌	12	4.3	26200	0.358	66.3	----	+176.8	+16.5
−1086	5	13	1324529	壬午	23	20.1	26200	1.060	98.2	18.6	+ 8.2	−15.1
−1086	11	7	1324707	庚辰	16	17.1	26100	1.572	115.6	50.0	+113.1	+13.6
−1085	5	3	1324884	丁丑	15	24.5	26100	1.324	101.3	38.6	+127.4	−12.4
−1085	10	27	1325061	甲戌	15	26.9	26100	0.805	97.9	----	+125.5	+10.0

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1083	3	13	1325564	丁酉	10	8.1	26100	0.317	64.1	----	−148.1	+ 7.6
−1083	9	5	1325740	癸巳	15	12.0	26100	0.281	56.3	----	+132.7	−11.6
−1082	3	2	1325918	辛卯	12	46.7	26100	1.633	117.4	51.8	+172.7	+11.1
−1082	8	26	1326095	戊子	7	25.6	26100	1.578	104.5	46.6	−110.7	−14.6
−1081	2	19	1326272	乙酉	12	48.1	26100	0.685	91.4	----	+172.5	+14.3
−1081	8	15	1326449	壬午	22	38.4	26100	0.845	91.2	----	+ 20.9	−17.1
−1080	12	29	1326951	甲辰	19	3.9	26000	0.524	73.4	----	+ 75.6	+24.6
−1079	6	24	1327128	辛丑	19	48.8	26000	0.507	81.8	----	+ 61.2	−24.2
−1079	12	19	1327306	己亥	10	48.2	26000	1.742	106.1	49.0	−161.9	+23.4
−1078	6	13	1327482	乙未	22	5.0	26000	1.738	115.1	52.4	+ 26.6	−22.4
−1078	12	8	1327660	癸巳	23	32.9	26000	0.690	86.1	----	+ 5.8	+21.4
−1077	6	3	1327837	庚寅	7	10.6	26000	0.371	65.8	----	−109.9	−19.8
−1076	4	23	1328162	乙卯	15	52.0	26000	0.106	35.0	----	+121.1	− 9.9
−1076	10	17	1328339	壬子	10	1.7	26000	0.007	10.2	----	−152.9	+ 6.8
−1075	4	13	1328517	庚戌	8	19.7	26000	1.416	105.0	43.1	−124.6	− 5.3
−1075	10	6	1328693	丙午	13	36.0	25900	1.371	108.8	42.6	+154.4	+ 1.6
−1074	4	2	1328871	甲辰	19	58.5	25900	0.891	96.8	----	+ 62.1	− 0.4
−1074	9	26	1329048	辛丑	0	32.6	25900	1.039	96.5	14.9	− 8.9	− 3.4
−1072	2	10	1329550	癸亥	8	33.2	25900	0.235	56.8	----	−123.7	+16.8
−1072	8	5	1329727	庚申	21	24.4	25900	0.373	66.3	----	+ 39.4	−19.1
−1071	1	29	1329904	丁巳	15	14.9	25900	1.650	110.0	49.5	+135.7	+20.2
−1071	7	26	1330082	乙卯	5	16.9	25900	1.698	115.3	52.0	− 79.0	−21.9
−1070	1	19	1330259	壬子	4	28.8	25900	0.799	87.2	----	− 63.5	+22.9
−1070	7	15	1330436	己酉	6	47.7	25900	0.571	86.0	----	−102.3	−24.0
−1069	11	29	1330938	辛未	20	41.3	25800	0.353	66.0	----	+ 48.1	+19.4
−1068	5	24	1331115	戊辰	6	37.5	25800	0.924	93.7	----	−101.5	−18.0
−1068	11	18	1331293	丙寅	0	29.0	25800	1.564	115.7	49.9	− 9.7	+17.1
−1067	5	13	1331469	壬戌	22	54.0	25800	1.461	103.4	43.9	+ 14.4	−15.9
−1067	11	6	1331646	己未	23	32.0	25800	0.818	98.3	----	+ 4.1	+14.0
−1066	5	3	1331824	丁巳	15	54.4	25800	0.081	31.3	----	+119.6	−13.2
−1065	3	24	1332149	壬午	17	20.9	25800	0.200	52.0	----	+102.7	+ 3.4
−1065	9	16	1332325	戊寅	23	35.1	25800	0.235	51.7	----	+ 6.3	− 7.4
−1064	3	12	1332503	丙子	19	47.4	25800	1.526	116.5	49.7	+ 66.8	+ 7.1
−1064	9	5	1332680	癸酉	15	43.3	25800	1.514	103.9	45.1	+124.5	−10.8
−1063	3	1	1332857	庚午	20	5.7	25700	0.780	95.8	----	+ 62.7	+10.6
−1063	8	26	1333035	戊辰	6	35.7	25700	0.916	94.0	----	− 98.5	−13.8
−1061	1	10	1333537	庚寅	3	47.6	25700	0.505	72.2	----	− 54.0	+24.1
−1061	7	6	1333714	丁亥	2	22.0	25700	0.360	70.5	----	− 36.4	−24.5
−1061	12	30	1333891	甲申	19	36.4	25700	1.729	106.3	49.0	+ 67.4	+23.9
−1060	6	24	1334068	辛巳	4	53.0	25700	1.805	115.0	52.6	− 74.9	−23.6

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1060	12	19	1334246	己卯	8	9.1	25700	0.691	86.4	----	−122.1	+22.7
−1059	6	13	1334422	乙亥	14	23.6	25700	0.516	75.7	----	+142.0	−21.7
−1057	4	24	1335102	乙未	15	46.9	25600	1.285	103.0	37.4	+122.6	− 9.4
−1057	10	17	1335278	辛卯	21	57.6	25600	1.355	108.3	41.9	+ 28.3	+ 6.1
−1056	4	13	1335457	庚寅	3	3.8	25600	1.016	101.4	10.1	− 45.4	− 4.7
−1056	10	6	1335633	丙戌	9	8.1	25600	1.067	97.0	19.2	−138.5	+ 1.1
−1054	2	20	1336135	戊申	16	3.2	25600	0.168	48.3	----	+123.7	+13.5
−1054	8	17	1336313	丙午	5	6.6	25600	0.278	58.2	----	− 76.1	−16.3
−1053	2	9	1336489	壬寅	23	19.2	25600	1.600	109.3	48.6	+ 15.0	+17.5
−1053	8	6	1336667	庚子	12	24.0	25600	1.584	114.8	50.3	+174.6	−19.8
−1052	1	30	1336844	丁酉	13	0.9	25500	0.841	88.7	----	+169.3	+20.8
−1052	7	25	1337021	甲午	13	33.0	25500	0.700	93.2	----	+157.0	−22.6
−1051	12	10	1337524	丁巳	5	13.4	25500	0.344	65.5	----	− 79.0	+21.5
−1050	6	4	1337700	癸丑	13	54.8	25500	0.787	88.3	----	+149.1	−20.4
−1050	11	29	1337878	辛亥	8	40.0	25500	1.556	115.8	49.8	−131.8	+20.0
−1049	5	25	1338055	戊申	6	23.5	25500	1.599	104.9	47.3	− 98.3	−18.8
−1049	11	18	1338232	乙巳	7	38.5	25500	0.828	98.7	----	−117.3	+17.5
−1048	5	13	1338409	壬寅	23	18.3	25500	0.211	49.6	----	+ 8.0	−16.6
−1047	4	4	1338735	戊辰	0	23.3	25500	0.070	31.4	----	− 4.0	− 0.8
−1047	9	27	1338911	甲子	8	8.7	25400	0.201	47.9	----	−122.7	− 3.1
−1046	3	24	1339089	壬戌	2	38.8	25400	1.403	115.0	45.9	− 37.1	+ 3.0
−1046	9	17	1339266	己未	0	11.4	25400	1.463	103.3	43.7	− 3.1	− 6.7
−1045	3	13	1339443	丙辰	3	11.9	25400	0.891	100.2	----	− 44.6	+ 6.7
−1045	9	6	1339620	癸丑	14	40.0	25400	0.973	96.1	----	+140.0	−10.1
−1043	1	20	1340122	乙亥	12	26.7	25400	0.479	70.5	----	+177.3	+22.8
−1043	7	16	1340299	壬申	9	0.3	25400	0.221	56.4	----	−135.2	−24.0
−1042	1	10	1340477	庚午	4	19.5	25400	1.710	106.4	48.9	− 62.1	+23.4
−1042	7	5	1340653	丙寅	11	46.3	25400	1.666	114.1	51.3	−177.5	−23.9
−1042	12	30	1340831	甲子	16	40.6	25400	0.698	87.0	----	+111.3	+23.2
−1041	6	24	1341007	庚申	21	43.3	25300	0.654	83.1	----	+ 32.5	−22.9
−1039	5	4	1341687	庚辰	23	7.8	25300	1.147	100.3	28.2	+ 11.5	−13.3
−1039	10	28	1341864	丁丑	6	25.2	25300	1.347	107.8	41.4	− 99.0	+10.4
−1038	4	24	1342042	乙亥	10	2.1	25300	1.151	105.5	29.8	−151.0	− 8.8
−1038	10	17	1342218	辛未	17	50.2	25300	1.085	97.3	21.5	+ 90.4	+ 5.5
−1036	3	2	1342720	癸巳	23	25.0	25300	0.088	35.2	----	+ 12.7	+ 9.7
−1036	8	27	1342898	辛卯	12	56.1	25300	0.195	49.5	----	+166.3	−12.9
−1035	2	20	1343075	戊子	7	17.6	25200	1.537	108.5	47.2	−104.8	+14.1
−1035	8	16	1343252	乙酉	19	40.1	25200	1.482	114.0	47.8	+ 65.7	−16.9
−1034	2	9	1343429	壬午	21	22.2	25200	0.897	90.6	----	+ 44.3	+18.1
−1034	8	5	1343606	己卯	20	25.3	25200	0.816	98.6	----	+ 54.4	−20.5

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1033	12	21	1344109	壬寅	13	41.6	25200	0.331	64.6	----	+155.1	+22.7
−1032	6	14	1344285	戊戌	21	15.6	25200	0.655	82.1	----	+ 39.2	−22.0
−1032	12	9	1344463	丙申	16	50.4	25200	1.548	115.9	49.7	+106.5	+22.1
−1031	6	4	1344640	癸巳	13	51.8	25200	1.739	105.8	49.3	+149.7	−21.1
−1031	11	28	1344817	庚寅	15	48.2	25200	0.836	98.9	----	+120.9	+20.5
−1030	5	25	1344995	戊子	6	39.2	25200	0.344	62.3	----	−102.4	−19.5
−1029	10	8	1345496	己酉	16	48.2	25100	0.177	45.1	----	+106.7	+ 1.4
−1028	4	3	1345674	丁未	9	22.8	25100	1.271	112.8	39.7	−139.1	− 1.2
−1028	9	27	1345851	甲辰	8	44.0	25100	1.422	102.8	42.4	−131.9	− 2.3
−1027	3	23	1346028	辛丑	10	13.0	25100	1.011	104.1	8.7	−150.9	+ 2.5
−1027	9	16	1346205	戊戌	22	51.0	25100	1.018	97.7	10.3	+ 16.7	− 5.9
−1025	1	31	1346707	庚申	20	57.3	25100	0.439	67.9	----	+ 50.5	+20.6
−1025	7	27	1346884	丁巳	15	48.0	25100	0.097	37.9	----	+123.5	−22.6
−1024	1	21	1347062	乙卯	12	54.1	25100	1.679	106.4	48.6	+170.3	+22.1
−1024	7	15	1347238	辛亥	18	50.3	25000	1.538	112.7	48.8	+ 77.2	−23.4
−1023	1	10	1347417	庚戌	1	6.4	25000	0.715	88.1	----	− 13.9	+22.7
−1023	7	5	1347593	丙午	5	6.0	25000	0.787	88.9	----	− 77.5	−23.2
−1021	5	16	1348273	丙寅	6	24.1	25000	1.004	96.7	----	− 98.2	−16.7
−1021	11	8	1348449	壬戌	14	59.1	25000	1.347	107.5	41.3	+132.4	+14.3
−1020	5	4	1348627	庚申	16	54.3	25000	1.293	109.1	39.7	+105.0	−12.7
−1020	10	28	1348804	丁巳	2	38.1	25000	1.095	97.4	22.6	− 42.0	+ 9.8
−1018	9	7	1349483	丙子	20	54.5	24900	0.125	40.2	----	+ 46.2	− 9.0
−1017	3	3	1349660	癸酉	15	8.0	24900	1.463	107.3	45.1	+137.2	+10.3
−1017	8	28	1349838	辛未	3	1.7	24900	1.393	112.9	44.8	− 44.9	−13.5
−1016	2	21	1350015	戊辰	5	37.2	24900	0.963	92.7	----	− 79.5	+14.7
−1016	8	16	1350192	乙丑	3	26.6	24900	0.919	102.7	----	− 50.8	−17.6
−1015	12	31	1350694	丁亥	22	3.9	24900	0.311	63.0	----	+ 30.8	+23.0
−1014	6	26	1350871	甲申	4	41.1	24900	0.528	75.0	----	− 71.7	−22.9
−1014	12	21	1351049	壬午	0	55.2	24900	1.534	115.9	49.4	− 13.4	+23.3
−1013	6	15	1351225	戊寅	21	23.5	24900	1.872	106.1	50.1	+ 37.1	−22.7
−1013	12	9	1351402	乙亥	23	57.9	24800	0.846	99.2	----	− 0.5	+22.6
−1012	6	4	1351580	癸酉	14	1.3	24800	0.476	72.0	----	+147.1	−21.8
−1011	10	19	1352082	乙未	1	35.0	24800	0.164	43.4	----	− 25.6	+ 5.8
−1010	4	14	1352259	壬辰	15	57.0	24800	1.125	109.3	28.4	+121.2	− 5.3
−1010	10	8	1352436	己丑	17	25.0	24800	1.394	102.5	41.4	+ 97.1	+ 2.1
−1009	4	3	1352613	丙戌	17	6.5	24800	1.145	107.7	29.8	+104.7	− 1.7
−1009	9	28	1352791	甲申	7	9.3	24800	1.051	99.0	17.2	−108.6	− 1.6
−1007	2	11	1353293	丙午	5	21.2	24800	0.388	64.4	----	− 75.2	+17.8
−1006	1	31	1353647	庚子	21	23.7	24700	1.638	106.4	48.2	+ 43.6	+19.9
−1006	7	27	1353824	丁酉	2	0.7	24700	1.421	110.9	45.1	− 29.8	−22.0

Date			JD	干支	UT		ΔT	Mag	Half-Dur		Moon in zenith	
y	M	d			h	m	s		m	m	o	o
−1005	1	21	1354002	乙未	9	22.5	24700	0.743	89.7	----	−136.9	+21.4
−1005	7	16	1354178	辛卯	12	36.6	24700	0.910	93.3	----	+170.5	−22.7
−1003	5	26	1354858	辛亥	13	38.8	24700	0.859	92.1	----	+152.9	−19.7
−1003	11	18	1355034	丁未	23	35.3	24700	1.350	107.2	41.3	+ 3.7	+17.8
−1002	5	15	1355212	乙巳	23	41.7	24700	1.440	111.9	46.1	+ 2.6	−16.1
−1002	11	8	1355389	壬寅	11	30.2	24700	1.100	97.3	23.2	−175.2	+13.7
−1000	9	18	1356069	壬戌	4	59.3	24600	0.069	30.2	----	− 75.6	− 4.8
− 999	3	13	1356245	戊午	22	50.1	24600	1.375	105.8	41.9	+ 20.8	+ 6.2
− 999	9	7	1356423	丙辰	10	32.0	24600	1.318	111.9	41.6	−157.9	− 9.6