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PHOTOELECTRIC STUDY
OF THE RR_c VARIABLE RU PISCUM

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ABSTRACT

In 1961—1964 4204 photoelectric observations in yellow colour were obtained utilizing the 24-inch reflector of the Astronomical Institute of the Slovak Academy of Sciences at Skalnaté Pleso. The analysis of the observations shows rapid variations in the primary period and the existence of a secondary period. $P_B = 28.8$ days, in the course of which the amplitude of the light curve varies between 0^m459 and 0^m531 .

INTRODUCTION

The variable star RU Psc of type RRc shows very rapid and complicated changes of period. Its variability was discovered by Leavitt (1923). Later this star was studied by several authors including Zessevitch (1924), Detre (1934), Gaposkin (1952), Dezsó (1945), and Pelishenko (1949). Zessevitch (1924) derived the approximate value of the period as $P = 0^d3898$ on the basis of 220 visual observations. This value was later improved by Detre (1934) who found from 472 visual photometric observations $P = 0^d390398$. Detre was the first to publish a light curve which is unusual in form. The amplitude of the light changes was 0^m47 . Gaposkin (1952) found that the period varied therefore he calculated the mean value of the period for different time-intervals. The extreme values of the period he found were $0^d3902139$ and $0^d3904577$. The variable was independently studied in detail by Dezsó (1945) who analyzed 759 photographic observations, obtained at the 16 cm astrograph of the Konkoly Observatory. His analysis of the observations showed that the period varied and these variations could be expressed by a periodic term, the period of the changes of the primary period being 1080 days. The conclusions reached by Dezsó were made more accurate by Pelishenko (1949) who expressed the changes of the primary period by a combination of secular and periodic terms. The present author's analysis showed that the accuracy and number of observations of the preceding authors were insufficient for a detailed study of the star. Although the changes in the primary period are not discussed in detail in this paper, the preliminary results show, that Dezsó's and Pelishenko's conclusions are not valid.

The mean radial velocity of RU Psc is $V_r = -115$ km/sec, its distance $r = 950$ ps. The space velocity components are $V_x = -405$ km/sec, $V_y = -229$ km/sec, $V_z = -15$ km/sec. The star has a retrograde motion in the Galaxy (Losinsky, 1952). The data on the space motion of the star are collected in Eggen's catalogue (1964) of high-velocity stars. A spectroscopic study of the star was made by Preston (1959), who found for the difference between the spectral types derived from the hydrogen lines and from the K line of Ca II at minimum light the value $\Delta S = 7$.

OBSERVATIONAL MATERIAL AND REDUCTION

Simultaneous photoelectric observations were programmed in order to study the recognizable irregularities of this variable star. The reason why the analysis of the light changes was made only upon the basis of our own obser-

vational material, will be given below. Observations were obtained at the 24-inch, $f/5.5$ reflector of the Astronomical Institute at Skalnaté Pleso in three observational seasons, from August 1, 1961 to September 9, 1961, from October 10, 1962 to January 29, 1963 and from August 4, 1963 to January 23, 1964. The photoelectric photometer was placed in the Newtonian focus which, due to the mounting of the telescope, was not easily accessible, therefore, a guiding telescope was used for pointing the stars. Consequently it was difficult to observe in several colours and to use sufficiently small focal diaphragms. The photoelectric photometer consisted of an optical part with a set of filters and focal diaphragms. The quartz Fabry lens imaged the entrance pupil of the telescope as a disc of 4.3 mm diameter on the photocathode of the photomultiplier. The light receiver was a 1 P 21 photomultiplier at first supplied from dry batteries, later a high-voltage stabilizer of the type NBZ 411 was used. The electronic part consisted of a DC amplifier and a microammeter which served to read the signal. Since 1963 an electronic recorder EZ 4 has been in use. The filter employed for all observations was a 2 mm Schott GG—11 yellow filter. During the observations we used focal diaphragms of 24, 42 and 75 seconds of arc. A detailed description of the photoelectric photometer will be given in another paper. During the whole observational period the star BD + 23°163 (9^m1) served as comparison star. Corrections for differential extinction were not made since the comparison star and the variable are only 23.2 minutes of arc from one another. Even in zenith distances of $z = 60^\circ$ the differential extinction did not exceed 0^m004. During observations with an amplifier and microammeter we used the following observational scheme: variable, sky, variable, comparison star, sky, comparison star, variable, sky, variable etc. Each observation consisted of three consecutive readings of the deflection of the microammeter in intervals of 10 seconds. During observation with a recorder we used a more economical scheme whereby only 1/5 of the observation time was devoted to the observation of the comparison star.

The observations were reduced in the following way: first the arithmetic means were calculated from three consecutive readings of the microammeter for the variable star, the comparison star and the sky respectively; then the arithmetic means of the values of the deflections of the variable and comparison star were reduced for the sky. Finally we computed the ratios of the reduced arithmetic means of the intensities of the variable and comparison star. These ratios were converted to differences in magnitudes by means of the known relation using appropriate tables. The observations from the recorder were reduced in a similar way.

INTERPRETATION OF OBSERVATIONAL MATERIAL

During the three observational periods in 1961—1964 altogether 5616 photoelectric observations were obtained. Since small light oscillations had to be investigated, observations obtained under less suitable observational conditions were omitted. Table I contains a survey of the observational intervals, the mean error of one observation and the observational conditions. Several members of the Astronomical Institute at Skalnaté Pleso participating in the observational programme obtained the following number of observations: M. Antal 5, D. Hlinická 73, J. Málková 7, I. Petras 265, J. Petras 538, L. Petrik

1937, M. Rybansky 18, D. Sajták 78, M. Weidlich 136, P. Zimmermann 134, J. Tremko 1013. For reasons mentioned above 1412 observations were eliminated from the treatment. The observational intervals in which the observations were omitted because of insufficient accuracy were as follows:

2437565.6308 — .6438,	2437948.2985 — .3068,	2437948.4026 — .4151,
2437998.4159 — .4624,	2438019.4580 — .4718,	2438027.4435 — .4581,
2438053.3680 — .3716,	2438058.3422 — .3662,	2438246.4497 — .5066,
2438256.4068 — .4864,	2438258.4020 — .4336,	2438268.5662 — .5825,
2438291.4982 — .5806,	2438291.6050 — .6291,	2438293.3837 — .4215,
2438296.4985 — .5641,	2438297.3066 — .5414,	2438316.3499 — .4299,
2438318.3364 — .3820,	2438327.3572 — .5193,	2438365.4968 — .5108,
2438382.4084 — .4869,	2438400.4210 — .4344,	2438402.4210 — .4310.

All the observations included in the analysis are given in Tab. V. The moments of observations in the first column of Tab. V are heliocentric.

The observations in each night were plotted separately. By comparing the observations from different nights it was found that the light curve changes from epoch to epoch. It was first necessary to determine whether or not the changes are periodic. For this purpose the moments when the star passed the magnitude $\Delta m = +0^m400$ and $\Delta m = +0^m580$ on the ascending branch were determined for each day of observation. The moments were chosen so that they occurred on both sides of the hump on the ascending branch of the light curve. The observed epochs for $\Delta m = +0^m580$ and for $\Delta m = +0^m400$ are listed in Tab. II. In that table the first column contains the year of observation, the second the numbering of epochs, the third and fifth the observed heliocentric epochs for $\Delta m = +0^m580$ and $\Delta m = +0^m400$, respectively, the fourth and sixth the corresponding O—C differences. The counting of the epochs and the calculation of the O—C differences were performed on the basis of the following elements:

$$C = 2424057.8450 + 0^d3903174.E \quad (1)$$

The calculation of the length of the period was accomplished from the photoelectric observations in Budapest and Skalnaté Pleso. The last two columns of Tab. II give the brightness of the maxima and minima. The values of the O—C differences exhibit large changes in the primary period which from the beginning of the observational interval from J. D. 2437513 shortened until it reached a minimum value around J. D. 2438120. Lengthening of the period is observed later and the O—C curve had a maximum around J. D. 2438370. At the end of the observational interval in 1963—64 shortening of the primary period is again observed. The changes in primary period are irregular, as can be seen in Fig. 1 which is a plot of the values from Tab. II. The full circles in Fig. 1 are observed epochs for $\Delta m = +0^m580$ on the ascending branch and the empty circles are slightly extrapolated values for the same Δm . The crosses denote the observed epochs for $\Delta m = +0^m400$ on the ascending branch. The epochs derived by means of the descending branch were omitted from the analysis. The changes in primary period are clearly visible even before 1961, as is seen from a preliminary analysis of the photoelectric observations at Budapest denoted by squares in the figure.

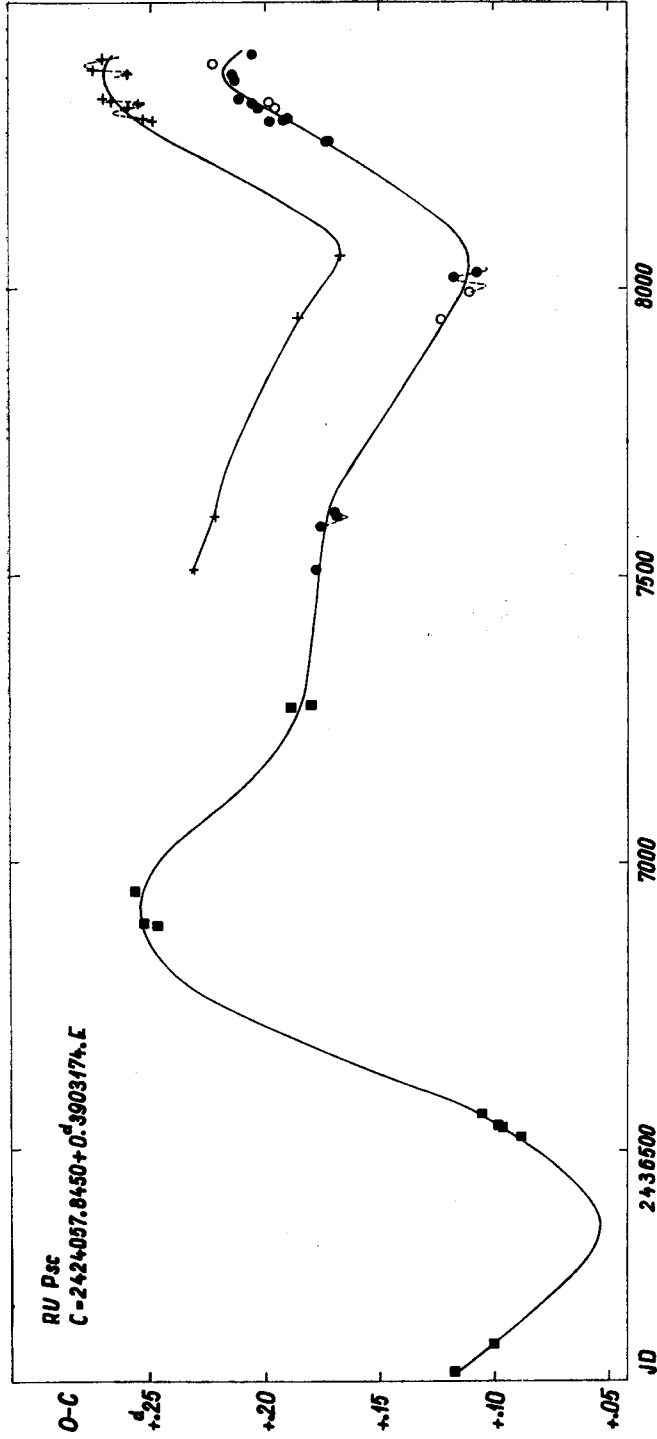


Fig. 1.: O-C diagrams for two points on the ascending branch. Below for $\Delta m = +0^m580$; open circles represent values obtained by a slight extrapolation. Above (crosses) for $\Delta m = +0^m400$. Squares represent B. Balázs' photoelectric observations at Budapest

On the curve of the differences O—C for the primary period small oscillations are superposed which are especially pronounced for the moment $\Delta m = +0^m400$ of the ascending branch. For these moments the O—C values have a minimum at J. D. 2438294.0, J. D. 2438323.0 and J. D. 2438378.0. For the moments $\Delta m = +0^m580$ of the ascending branch three further minima of the O—C values were observed: J. D. 2437603, 2438006 and 2438034. A secondary period $P_B = 28.8$ days could be derived from these minima, but of course with a rather great uncertainty, because the secondary period had not necessarily a constant value. If the brightnesses of the maxima and minima given in the last two columns of Tab. II are arranged according to the phase of the secondary period using the formula:

$$C = \text{J. D. } 2438378.0 + 28^d8.E. \quad (2)$$

it was seen that the brightness of the maximum and minimum varied quite distinctly with a small amplitude. The amplitude of the variation in the brightness of the maxima was 0^m034 and the variation of the brightness of the minima 0^m040 . If the maxima were brighter, the minima were fainter and vice versa. This is characteristic for the Blashko effect, in the same way as the oscillations of the moments on the ascending branch. The dispersion in all the diagrams exceeds the value expected from the accuracy of the observations, indicating the existence of irregular changes in the shape of the light curve. The time oscillations of two points on the ascending branch and the brightness changes in maximum and minimum of the light curve are shown in Fig. 2 for different phases of the secondary period.

Since the shape of the light curve changed with the phase of the secondary period, a mean light curve from all observations and light curves for selected phases of the secondary period were constructed. For this purpose, the brightnesses from the individual light curves were determined for 23 values of the phase f of the primary period. These data were tabulated in Tab. III. The values of the phase f are in fractions of a day and the phase of the secondary period, ψ , in days. Then the brightnesses for different phases of the primary period, f , were plotted in graphs as functions of the phase of the secondary period, ψ . The brightnesses were read from these graphs for three values of ψ — for $\psi = 0^d$, $\psi = 8^d$ and $\psi = 19^d$ respectively — and are given in Tab. IV together with the data for the mean light curve. The mean light curve and the light curves for the above mentioned three phases of the secondary period are plotted in Fig. 3. Unfortunately, there are few observations for the interval $\psi = 8^d$ to $\psi = 22^d$. The light curves for $\psi = 8^d$ and $\psi = 19^d$ approximately represent the extreme light curves. For $\psi = 8^d$ the maximum is bright, the minimum faint and the whole light curve is shifted to the left compared with the mean light curve. The hump on the ascending branch is the longest for this phase. On the other hand, for the phase $\psi = 19^d$, the maximum is lowest, the minimum highest and the whole light curve is shifted to the right with respect to the mean light curve. The hump on the ascending branch is barely visible.

From the mean light curve we obtain for the brightness of the maximum $\Delta m = +0^m323$ and for the brightness of the minimum $\Delta m = +0^m810$, hence the mean amplitude of the light curve is 0^m487 . The amplitude of the light curve fluctuates in the course of the secondary period from 0^m459 to

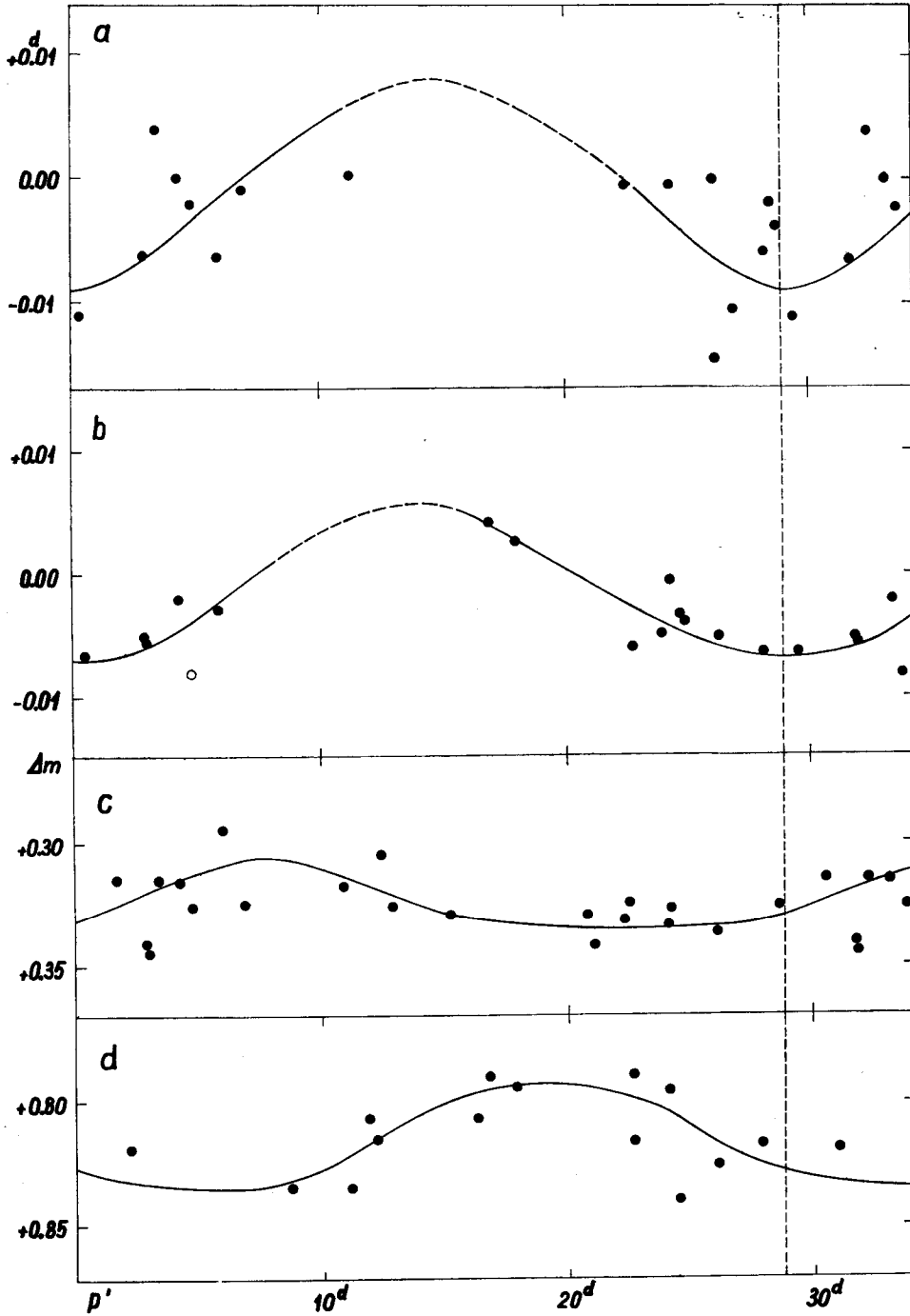


Fig. 2.: Above: time-oscillation of the ascending branch for $\Delta m = +0^m580$ (a) and $\Delta m = +0^m400$ (b). Below: the variation of the brightness of the maximum (c) and minimum (d) in course of the secondary period, $P_B = 28.8$ days

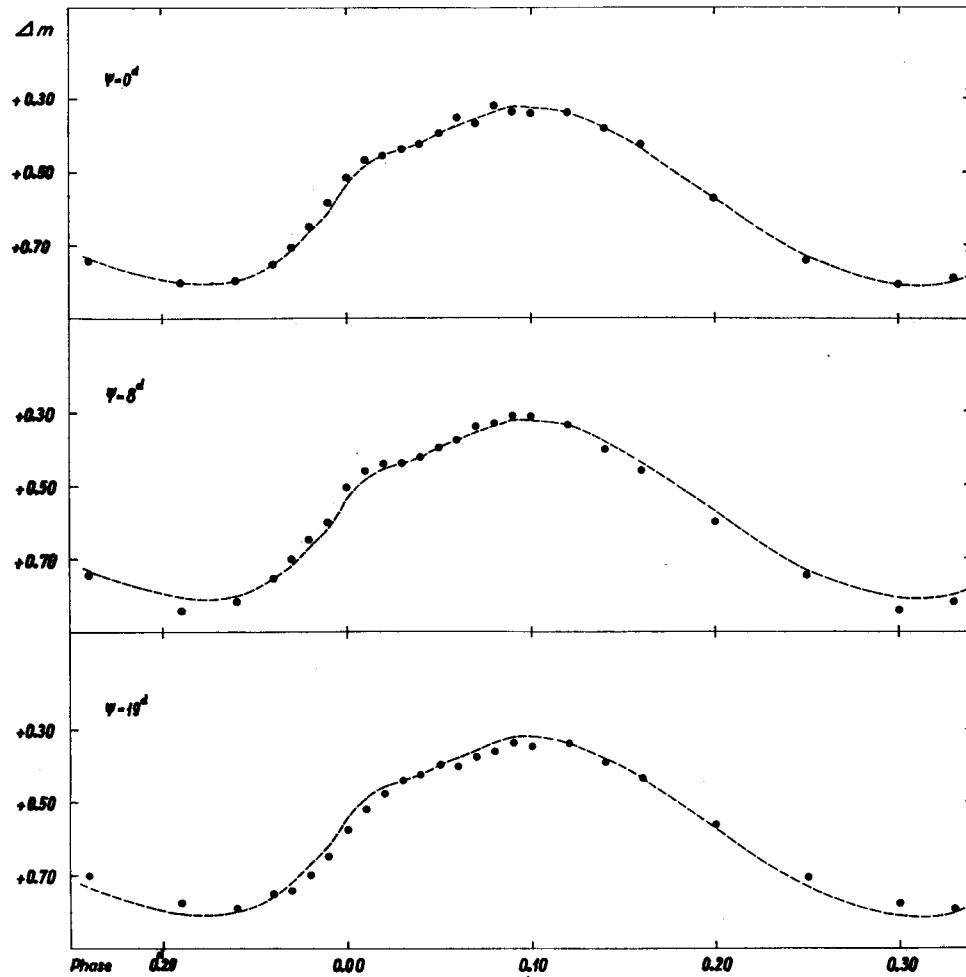


Fig. 3.: The light curve of RU Psc for three different phases of the secondary period. The dashed line is the mean light curve, constructed from all the observations

0^m531 . The time interval between light minimum and light maximum is 0^d168 , or 0^F430 .

The Konkoly Observatory in Budapest has photoelectric observations from 1952 and 1957—1960 and also unpublished photographic material from 1944—1952. This material, together with other observations available, will be discussed in a coming paper in connection with a study of changes in the primary period.

Table I.
OBSERVING INTERVALS AND M. E. OF ONE OBSERVATION

Date	J. D.	n	m. e.	Notes
1961 Aug. 1/2	7513.4356—.4926	14	\pm .011	
Sept. 22/23	7565.4348—.6271	65	.012	
Oct. 9/10	7582.5923—.6368	16	.006	
" 10/11	7583.5825—.6304	17	.008	
" 11/12	7584.5700—.6501	24	.012	
" 13/14	7586.5376—.5515	5	.004	
" 16/17	7589.3104—.5465	69	.019	
Nov. 2/3	7606.3150—.4011	42	.008	
" 8/9	7612.3501—.5515	62	.007	
1962 Oct. 10/11	7948.3089—.4151	48	.008	
" 11/12	7949.3061—.4818	57	.008	
Nov. 28/29	7997.2416—.3722	53	.021	
" 29/30	7998.2944—.4097	45	.014	
Dec. 20/21	8019.3302—.4448	60	.016	
" 21/22	8020.2183—.4238	74	.016	
" 28/29	8027.2386—.4414	101	.013	
1963 Jan. 23/24	8053.2574—.3630	33	.016	
" 28/29	8058.2701—.3313	17	.014	
Aug. 4/5	8246.5073—.5812	57	.015	
" 14/15	8256.5091—.5837	63	.015	
" 16/17	8258.4346—.5937	115	.012	
" 26/27	8268.4053—.5588	117	.017	
Sept. 18/19	8291.3645—.6044	161	0.16	1
" 20/21	8293.3642—.5593	132	.018	1
" 21/22	8294.4185—.5995	185	.013	1, 2
" 23/24	8296.3952—.6438	185	.013	4
" 24/25	8297.5431—.5809	36	.014	1, 2
" 26/27	8299.3592—.3738	15	.021	4
Oct. 12/13	8315.3325—.5498	123	.019	5
" 13/14	8316.3139—.3533	29	.021	2
" 15/16	8318.4455—.5746	83	.017	
" 16/17	8319.3208—.5556	197	.014	1
" 19/20	8322.3952—.5763	206	.015	
" 20/21	8323.3056—.5079	169	.007	6
" 22/23	8325.2942—.3091	16	.019	1
" 24/25	8327.2823—.6369	215	.015	5
" 26/27	8329.2910—.3711	76	.013	2, 3
" 27/28	8330.4858—.5427	38	.014	3
" 28/29	8331.3804—.6288	147	.015	
Nov. 9/10	8343.5048—.5562	38	.016	1
Dec. 1/2	8365.2374—.5239	177	.016	
" 11/12	8375.2108—.4830	222	.013	1
" 18/19	8382.3078—.4073	76	.016	1
" 29/30	8393.3356—.4305	75	.012	1
" 31/1	8395.2094—.2339	24	.012	
1964 Jan. 4/5	8399.2069—.3821	89	.020	
" 5/6	8400.2905—.4151	88	.014	
" 7/8	8402.3063—.4198	83	.016	1
" 11/12	8406.2503—.2589	14	.007	2
" 12/13	8407.2238—.3127	74	.022	
" 20/21	8415.3287—.3861	60	.012	
" 23/24	8418.3720—.3856	17	.014	5

Notes. 1. Interfering cirrus. 2. Wind. 3. Interfering fog. 4. Interfering clouds
5. Bad transparency. 6. Sky very good.

Table II
O-C VALUES AND BRIGHTNESS AT MAXIMUM AND MINIMUM LIGHT

Year	E	$t_{\Delta m = +0.10}$	O-C	$t_{\Delta m = +0.10}$	O-C	Δm_{\max}	Δm_{\min}
		243....		243....			
1961	34 473	7513.4333	+0.1766	7513.4859	+0.2292		
	34 606	7565.-				+0.325	
	34 650	7582.-				+0.318	
	34 653	7583.-					+0.807
	34 655	7584.-				+0.326	
	34 668	7589.5426	+0.1740				+0.794
	34 711	7606.3195	+0.1672	7606.3720	+0.2197		
	34 427	7612.5649	+0.1676				+0.815
1962	35 590	7949.3626:	+0.1213:	7949.4253	+0.1840	+0.315	
	35 713	7997.3590:	+0.1087:				+0.789
	35 772	8020.3947	+0.1157				+0.800
	35 790	8027.4106	+0.1159				+0.756
1963	35 856	8053.-				+0.330	
	35 869			8058.3047	+0.1649		
	36 351	8246.-				+0.305	
	36 377	8256.5927	+0.1716				+0.816
	36 382	8258.5437	+0.1711				+0.832
	36 407	8268.-				+0.305	
	36 466	8291.3551	+0.1958	8291.4123	+0.2530	+0.326	
	36 471			8293.3643:	+0.2539:	+0.315:	
	36 474	8294.4720	+0.1902	8294.5283	+0.2465	+0.341	
	36 479	8296.4214	+0.1880	8296.4849:	+0.2515:		
	36 482	8297.5909:	+0.1865:				
	36 528	8315.5531:	+0.1941:				+0.775
	36 530	8316.3411	+0.2015				
	36 538	8319.4637	+0.2015	8319.5197	+0.2575	+0.345	+0.817
	36 546	8322.5862:	+0.2015:				+0.819
	36 548	8323.3692	+0.2039	8323.4188	+0.2535	+0.345	
	36 553	8325.3127:	+0.1958:				
	36 558			8327.3333	+0.2648		+0.835
	36 563					+0.320	
	36 569	8331.5716:	+0.2096:	8331.6291	+0.2671		+0.835
36 656	8365.5310	+0.2114				+0.807	
36 681	8375.2894	+0.2119	8375.3351	+0.2576	+0.337	+0.825	
36 699	8382.3180	+0.2147	8382.3754	+0.2721			
36 727	8393.-				+0.330		
36 732	8395.2042:	+0.2205:					
1964	36 742	8399.-				+0.342	
	36 745			8400.3265	+0.2686	+0.320	
	36 750	8402.-				+0.327	
	36 763	8407.2869	+0.2033				

Table IV.

MEAN LIGHT CURVE ($\overline{\Delta m}$) AND LIGHT CURVES
FOR DIFFERENT PHASES OF SECONDARY PERIOD

Phase	$\overline{\Delta m}$	Δm		
		$\psi = 0^\circ$	$\psi = 8^\circ$	$\psi = 19^\circ$
	+	+	+	+
0.00	0.533	0.508	0.503	0.574
0.01	0.487	0.469	0.458	0.518
0.02	0.456	0.455	0.442	0.474
0.03	0.440	0.440	0.440	0.440
0.04	0.426	0.426	0.426	0.426
0.05	0.395	0.395	0.395	0.395
0.06	0.376	0.353	0.378	0.399
0.07	0.357	0.366	0.339	0.373
0.08	0.338	0.320	0.333	0.358
0.09	0.322	0.336	0.309	0.336
0.10	0.327	0.340	0.310	0.344
0.12	0.339	0.339	0.339	0.339
0.14	0.381	0.384	0.401	0.387
0.16	0.437	0.426	0.460	0.433
0.20	0.568	0.572	0.598	0.559
0.25	0.731	0.743	0.743	0.703
0.30	0.805	0.804	0.839	0.775
0.33	0.798	0.792	0.816	0.792
0.35	0.754	0.754	0.754	0.754
0.36	0.718	0.708	0.702	0.742
0.37	0.667	0.652	0.647	0.699
0.38	0.621	0.586	0.608	0.647
0.39	0.641	0.524	0.502	0.576

Table V.
LIST OF OBSERVATIONS

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
7513.4356	527	.5570	618	.5929	790
.4398	495	.5591	625	.5992	780
.4460	492	.5632	649	.6026	783
.4509	471	.5646	654	.6040	812
.4553	459	.5688	638	.6082	822
.4616	459	.5702	654	.6096	818
.4692	444	.5743	664	.6130	812
.4724	453	.5757	671	.6144	817
.4759	422	.5806	690	.6207	808
.4789	424	.5820	707	.6221	798
.4835	424	.5868	702	.6246	808
.4863	406	.5882	719	.6250	808
.4891	371	.5931	709	.6304	813
.4926	383	.5945	739		
		.5987	712	7584.5700	335
7565.4348	334	.6000	734	.5714	306
.4362	336	.6042	732	.5755	330
.4396	326	.6056	753	.5769	341
.4438	329	.6098	751	.5811	313
.4480	311	.6112	778	.5860	348
.4493	332	.6146	757	.5908	324
.4528	328	.6160	794	.5922	342
.4542	338	.6195	767	.5992	386
.4584	354	.6216	788	.6005	387
.4597	359	.6250	782	.6047	373
.4646	356	.6271	801	.6061	401
.4660	361			.6106	366
.4702	378	7582.5923	358	.6123	394
.4716	371	.5937	352	.6248	440
.4757	359	.5972	351	.6262	451
.4778	397	.5986	340	.6304	455
.4827	371	.6027	331	.6321	462
.4945	422	.6055	322	.6360	493
.4959	413	.6097	323	.6380	473
.5007	439	.6118	313	.6425	501
.5021	454	.6152	320	.6453	517
.5063	448	.6173	320	.6485	528
.5077	461	.6222	314	.6501	538
.5118	466	.6236	332		
.5132	495	.6277	307	7586.5376	335
.5167	481	.6298	322	.5425	341
.5181	487	.6347	327	.5439	352
.5223	493	.6368	337	.5488	354
.5237	515	.6409	354	.5515	372
.5278	499	.6430	356		
.5299	517	.6465	343	7589.3104	433
.5341	533	.6486	355	.3118	426
.5354	566	.6548	376	.3152	446
.5396	545			.3166	451
.5417	541			.3201	473
.5459	595	7583.5825	770	.3215	486
.5473	604	.5839	791	.3270	486
.5514	597	.5880	796	.3361	490
.5528	616	.5894	803	.3402	537
				.3416	513

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3465	532	.5361	610	.3731	552
.3506	580	.5423	516	.3744	555
.3520	600	.5465	610	.3758	563
.3562	597	7606.3150	644	.3786	569
.3576	600	.3164	609	.3800	584
.3611	619	.3199	569	.3828	585
.3624	619	.3213	578	.3842	587
.3666	623	.3234	563	.3869	587
.3680	612	.3241	555	.3883	593
.3729	612	.3261	534	.3911	616
.3743	626	.3268	538	.3925	623
.3784	651	.3289	513	.3953	619
.3798	680	.3303	513	.3967	627
.3847	688	.3324	477	.3994	643
.3895	642	.3345	481	.4008	640
.3909	709	.3359	471	.4043	656
.3944	666	.3366	463	.4057	646
.3958	681	.3393	464	.4568	807
.3999	700	.3400	442	.4606	788
.4013	701	.3428	440	.4620	807
.4069	733	.3435	439	.4654	794
.4097	761	.3463	433	.4710	797
.4104	751	.3470	445	.4724	806
.4118	744	.3504	419	.4751	806
.4124	752	.3511	411	.4779	808
.4152	744	.3546	451	.4809	806
.4166	750	.3560	436	.4821	817
.4196	764	.3588	430	.4849	821
.4210	765	.3595	440	.4863	829
.4249	781	.3622	430	.4897	817
.4263	761	.3636	426	.4911	817
.4319	763	.3671	409	.4939	803
.4354	771	.3685	413	.4953	813
.4368	802	.3713	397	.4981	812
.4409	795	.3761	397	.4994	813
.4423	775	.3775	389	.5022	813
.4472	778	.3803	382	.5036	808
.4486	781	.3810	397	.5175	811
.4527	795	.3838	367	.5210	782
.4541	774	.3845	398	.5224	792
.4569	803	.3878	375	.5251	789
.4583	784	.3893	353	.5265	776
.4652	783	.3956	349	.5300	762
.4687	781	.3977	339	.5314	778
.4701	791	.4011	341	.5349	750
.4861	815	7612.3501	476	.5363	743
.4909	823	.3529	473	.5404	719
.4993	802	.3557	461	.5418	723
.5072	781	.3571	478	.5454	715
.5086	887	.3599	491	.5467	702
.5124	787	.3613	505	.5501	679
.5138	733	.3647	518	.5515	686
.5187	707	.3661	522	7948.3089	345
.5201	704	.3689	542	.3103	348
.5243	689	.3703	563	.3123	343
.5340	672				

J. D. ☉ 243....	4m	J. D. ☉ 243....	4m	J. D. ☉ 243....	4m
.3137	353	.3325	738	.2590	765
.3158	351	.3353	756	.2611	742
.3172	362	.3367	734	.2624	775
.3193	360	.3387	723	.2645	761
.3207	365	.3401	716	.2659	786
.3228	371	.4075	457	.2680	752
.3242	369	.4089	431	.2694	735
.3262	360	.4110	453	.2722	746
.3276	374	.4123	438	.2735	776
.3297	367	.4144	435	.2763	750
.3311	380	.4158	427	.2777	770
.3332	382	.4179	418	.2798	749
.3346	388	.4193	408	.2819	787
.3367	381	.4214	420	.2840	775
.3380	386	.4228	409	.2854	773
.3401	405	.4248	400	.2881	797
.3415	397	.4262	403	.2916	812
.3443	398	.4283	391	.2930	789
.3457	408	.4297	385	.2951	790
.3478	416	.4318	383	.2965	771
.3492	416	.4332	372	.2999	773
.3512	414	.4353	368	.3013	749
.3526	408	.4367	360	.3034	802
.3547	417	.4387	358	.3048	802
.3623	463	.4401	352	.3083	765
.3637	451	.4422	365	.3110	768
.3665	447	.4436	365	.3144	770
.3679	461	.4457	344	.3145	732
.3700	467	.4471	349	.3159	765
.3714	486	.4492	333	.3180	820
.3735	464	.4505	320	.3215	791
.3748	478	.4526	327	.3249	776
.3769	503	.4540	328	.3263	705
.3797	511	.4596	329	.3291	764
.3811	521	.4610	323	.3305	725
.3832	536	.4631	313	.3506	689
.3846	552	.4644	312	.3520	592
.3867	530	.4665	307	.3541	675
.3880	548	.4679	312	.3555	639
.3908	549	.4700	319	.3583	550
.3922	560	.4714	317	.3597	589
.4026	651:	.4735	329	.3624	568
.4040	630:	.4748	318	.3638	522
.4137	637:	.4769	340	.3708	548
.4151	660:	.4783	332	.3722	579
		.4804	331		
		.4818	335		
7949.3061	824			7998.2944	348
.3075	807			.2965	366
.3130	812	7997.2416	743	.2985	367
.3144	831	.2430	752	.2999	377
.3158	807	.2451	728	.3020	389
.3179	794	.2465	744	.3034	375
.3193	799	.2506	747	.3069	384
.3214	761	.2534	727	.3090	376
.3228	762	.2548	758	.3110	373
.3290	729	.2576	761	.3152	406

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3166	403	.3705	456	.2474	697
.3194	398	.3732	434	.2488	707
.3208	411	.3746	443	.2509	674
.3235	413	.3767	441	.2523	697
.3249	462	.3781	441	.2954	752
.3298	418	.3802	434	.2974	761
.3347	418	.3816	440	.2988	799
.3360	407	.3885	478	.3023	800
.3388	491	.3899	461	.3058	789
.3402	474	.3920	495	.3072	767
.3437	473	.3934	474	.3106	819
.3451	486	.3955	497	.3127	809
.3472	481	.3968	470	.3141	794
.3485	487	.3989	475	.3162	764
.3506	484	.4003	500	.3176	808
.3520	505	.4024	490	.3342	791
.3562	510	.4045	521	.3363	785
.3576	517	.4080	540	.3377	791
.3617	512	.4093	535	.3398	804
.3631	553	.4114	515	.3412	807
.3652	518	.4128	531	.3433	761
.3666	531	.4149	525	.3447	785
.3694	527	.4163	538	.3467	779
.3708	546	.4184	548	.3481	787
.3742	576	.4198	536	.3502	806
.3756	572	.4218	545	.3516	806
.3777	569	.4232	535	.3537	792
.3791	561	.4253	550	.3551	775
.4041	626	.4267	553	.3582	785
.4055	637	.4288	578	.3586	773
.4083	619	.4302	594	.3606	777
.4097	643	.4323	603	.3620	762
.4124	633	.4337	598	.3641	782
.4197	647	.4364	554	.3655	752
		.4378	550	.3676	768
8019.3302	334	.4399	576	.3690	738
.3316	349	.4413	552	.3711	761
.3350	353	.4434	609	.3724	741
.3364	364	.4448	583	.3755	749
.3385	318			.3759	725
.3399	340	8020.2183	562	.3780	696
.3420	343	.2197	556	.3794	709
.3441	353	.2217	578	.3815	696
.3462	362	.2231	558	.3829	667
.3475	396	.2252	571	.3849	669
.3503	355	.2266	622	.3863	664
.3517	370	.2287	626	.3884	636
.3538	376	.2301	618	.3898	640
.3552	370	.2322	644	.3919	596
.3583	390	.2336	636	.3933	587
.3587	383	.2366	635	.3954	578
.3607	390	.2384	641	.3967	562
.3621	390	.2405	659	.4155	485
.3649	420	.2419	639	.4169	462
.3680	429	.2440	650	.4190	408
.3691	440	.2454	647	.4204	443

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.4224	426	.3365	750	.2842	357
.4238	409	.3386	777	.2874	332
8027.2386	605	.3402	748	.2907	319
.2414	591	.3421	763	.2940	326
.2449	605	.3435	767	.2974	320
.2476	611	.3456	735	.3007	322
.2490	636	.3469	734	.3044	380
.2511	640	.3490	734	.3072	334
.2525	642	.3504	758	.3100	351
.2546	635	.3525	765	.3129	350
.2560	648	.3539	748	.3168	368
.2581	640	.3560	743	.3201	358
.2595	650	.3574	754	.3261	360
.2615	652	.3594	731	.3294	402
.2629	669	.3608	744	.3323	395
.2650	661	.3629	744	.3354	372
.2664	679	.3643	709	.3382	423
.2685	674	.3664	716	.3407	416
.2699	680	.3678	710	.3431	432
.2719	676	.3699	701	.3455	413
.2733	704	.3712	706	.3481	445
.2754	699	.3733	706	.3506	434
.2768	701	.3747	711	.3535	487
.2789	692	.3768	686	.3564	471
.2803	715	.3782	688	.3598	499
.2844	725	.3817	697	.3630	478
.2865	730	.3831	686	8058.2701	444
.2879	724	.3851	697	.2742	441
.2900	720	.3865	662	.2776	436
.2914	746	.3886	681	.2816	488
.2935	760	.3900	676	.2855	466
.2949	744	.3921	687	.2890	451
.2969	730	.3935	686	.2930	454
.2983	737	.4115	599	.2977	419
.3004	750	.4139	580	.3015	413
.3018	732	.4150	543	.3052	392
.3039	761	.4164	522	.3091	348
.3053	745	.4185	515	.3140	351
.3074	732	.4199	520	.3174	318
.3087	723	.4268	477	.3207	305
.3108	740	.4282	461	.3244	298
.3122	762	.4303	467	.3281	309
.3143	727	.4317	441	.3313	297
.3157	731	.4337	438	8246.5073	365:
.3178	751	.4351	422	.5081	367:
.3192	778	.4372	407	.5090	342:
.3212	752	.4380	415	.5100	348:
.3226	786	.4414	430	.5109	371:
.3247	774	8053.2574	354	.5120	366:
.3261	782	.2602	342	.5131	314:
.3282	752	.2633	336	.5140	342:
.3296	791	.2671	334	.5151	343:
.3317	784	.2710	316	.5160	352:
.3331	777	.2780	343	.5168	333:
.3351	752	.2812	338	.5177	352:

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.5186	330:	.5199	814:	.4363	788
.5218	335:	.5211	800:	.4389	794
.5227	305:	.5220	842:	.4396	806
.5235	329:	.5229	813:	.4517	808
.5284	309:	.5239	814:	.4524	811
.5293	317:	.5249	805:	.4531	810
.5306	315:	.5273	827:	.4537	816
.5316	285:	.5283	829:	.4544	782
.5324	292:	.5291	823:	.4550	835
.5361	300:	.5301	823:	.4673	805
.5370	336:	.5311	808:	.4704	847
.5382	320:	.5323	809:	.4712	851
.5392	336:	.5331	832:	.4720	842
.5403	340:	.5339	820:	.4735	852
.5413	320:	.5347	818:	.4744	834
.5422	326:	.5368	828:	.4751	824
.5434	325:	.5376	827:	.4759	803
.5444	346:	.5386	822:	.4767	821
.5455	343:	.5394	821:	.4775	828
.5463	318:	.5403	810:	.4781	835
.5477	306:	.5424	814:	.4808	863
.5488	348:	.5436	787:	.4815	861
.5522	397:	.5447	819:	.4822	859
.5533	376:	.5472	771:	.4831	859
.5544	356:	.5481	774:	.4839	844
.5554	370:	.5492	794:	.4848	857
.5565	386:	.5502	792:	.4856	811
.5577	399:	.5510	798:	.4864	856
.5588	357:	.5519	821:	.4871	828
.5602	386:	.5529	805:	.4879	834
.5613	372:	.5556	781:	.4907	839
.5626	381:	.5567	762:	.4915	843
.5666	368:	.5577	779:	.4970	807
.5677	410:	.5587	757:	.4978	827
.5685	396:	.5598	764:	.4988	813
.5696	398:	.5608	765:	.4997	816
.5706	398:	.5616	765:	.5005	817
.5716	390:	.5627	746:	.5014	810
.5729	387:	.5650	730:	.5023	802
.5739	376:	.5661	708:	.5032	789
.5749	426:	.5671	717:	.5065	810
.5760	425:	.5682	708:	.5075	814
.5793	444:	.5695	707:	.5084	763
.5800	446:	.5705	692:	.5094	795
.5812	444:	.5714	693:	.5102	775
		.5724	707:	.5112	770
8256.5091	803:	.5735	699:	.5122	768
.5098	793:	.5748	652:	.5131	780
.5107	788:	.5774	661:	.5141	751
.5116	776:	.5785	652:	.5152	750
.5127	766:	.5797	644:	.5183	786
.5137	760:	.5827	661:	.5192	760
.5147	772:	.5837	683:	.5206	720
.5156	777:			.5225	761
.5183	823:	8258.4346	792	.5230	769
.5190	824:	.4356	776	.5238	736

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.5246	740	.5937	417	.4808	467
.5258	748			.4819	488
.5269	694	8268.4053	335	.4825	486
.5277	704	.4069	370	.4834	447
.5309	651	.4076	350	.4843	466
.5317	671	.4083	334	.4851	457
.5326	669	.4092	349	.4861	520
.5334	668	.4099	341	.4871	485
.5346	643	.4108	336	.4903	512
.5355	644	.4117	345	.4911	520
.5365	645	.4125	329	.4919	507
.5375	643	.4135	334	.4928	521
.5383	634	.4164	324	.4938	526
.5392	625	.4174	335	.4947	519
.5425	577	.4184	328	.4957	514
.5434	584	.4193	333	.4966	509
.5445	563	.4202	345	.4975	519
.5455	563	.4211	286	.4991	598
.5465	549	.4222	333	.5017	527
.5474	579	.4232	305	.5026	554
.5485	559	.4243	324	.5035	538
.5495	547	.4253	328	.5160	550
.5504	522	.4287	282	.5168	580
.5514	518	.4297	280	.5177	577
.5540	504	.4306	270	.5186	578
.5549	495	.4316	321	.5196	598
.5559	475	.4327	316	.5215	615
.5570	495	.4337	306	.5225	626
.5578	496	.4345	318	.5233	628
.5586	500	.4353	343	.5252	615
.5597	488	.4361	356	.5259	594
.5607	488	.4371	368	.5267	589
.5617	466	.4402	355	.5277	598
.5628	458	.4413	348	.5286	598
.5661	466	.4422	351	.5297	614
.5670	466	.4433	379	.5306	608
.5679	471	.4443	357	.5315	592
.5689	463	.4464	408	.5340	666
.5698	472	.4471	377	.5355	681
.5707	459	.4478	386	.5361	655
.5719	450	.4484	398	.5373	662
.5729	446	.4492	369	.5383	655
.5740	459	.4532	415	.5392	641
.5751	452	.4541	425	.5399	657
.5782	447	.4664	437	.5414	689
.5799	433	.4676	483	.5421	663
.5801	444	.4689	429	.5428	675
.5812	439	.4697	442	.5436	682
.5823	432	.4707	493	.5444	691
.5832	428	.4716	480	.5451	698
.5844	437	.4728	457	.5475	713
.5857	437	.4734	454	.5485	686
.5874	424	.4749	509	.5500	698
.5886	439	.4759	497	.5518	709
.5917	411	.4790	472	.5527	717
.5927	418	.4799	470	.5532	725

J. D. ☉ 243.....	Δm	J. D. ☉ 243.....	Δm	J. D. ☉ 243.....	Δm
.5539	743	.4178	359	.4673	344
.5546	723	.4188	359	.4680	345
.5553	745	.4195	378	.4689	346
.5561	722	.4202	385	.4695	350
.5570	744	.4209	369	.4719	374
.5578	747	.4216	405	.4727	361
.5588	765	.4225	377	.4735	357
		.4232	363	.4743	365
8291.3645	519	.4239	395	.4752	371
.3653	514	.4262	389	.4760	363
.3659	517	.4269	367	.4767	353
.3666	490	.4280	370	.4774	364
.3674	488	.4289	372	.4783	357
.3681	478	.4296	368	.4816	363
.3690	464	.4303	399	.4823	356
.3698	482	.4309	358	.4832	358
.3706	504	.4316	388	.4841	350
.3739	485	.4323	349	.4855	387
.3746	456	.4333	326	.4869	351
.3753	445	.4358	303	.4875	376
.3760	474	.4366	330	.4883	386
.3769	445	.4373	334	.4892	372
.3777	460	.4382	328	.4904	388
.3785	454	.4389	312	.4931	354
.3793	460	.4396	337	.4941	360
.3799	467	.4405	351	.4949	372
.3808	445	.4414	318	.4958	369
.3843	445	.4421	311	.5832	662
.3852	441	.4428	323	.5837	675
.3861	418			.5842	686
.3868	437	.4451	336	.5847	686
.3876	427	.4458	341	.5853	687
.3883	453	.4463	332	.5868	676
.3943	361	.4470	331	.5867	695
.3952	384	.4475	339	.5874	684
.3958	448	.4482	338	.5880	678
.3965	387	.4492	315	.5884	682
.3988	445	.4499	330	.5891	713
.3997	443	.4510	305	.5917	704
.4008	407	.4531	325	.5923	705
.4014	418	.4539	347	.5929	707
.4020	400	.4547	324	.5935	727
.4028	436	.4554	361	.5940	736
.4035	429	.4562	322	.5946	741
.4042	438	.4568	341	.5951	729
.4055	399	.4574	361	.5958	717
.4081	397	.4582	329	.5964	716
.4088	397	.4590	341	.5970	713
.4095	408	.4597	325	.5975	704
.4102	418	.4623	321	.5994	712
.4107	394	.4630	343	.6004	751
.4113	393	.4638	343	.6010	731
.4119	392	.4644	367	.6016	727
.4135	372	.4651	367	.6022	756
.4142	395	.4658	328	.6027	771
.4171	363	.4666	321	.6032	741

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.6038	771	.4684	466:	.5431	736:
.6044	751	.4696	442:	.5436	724:
8293.3642	379:	.4709	475:	.5454	740:
.3649	400:	.5073	623:	.5459	757:
.3660	435:	.5078	591:	.5463	709:
.3667	392:	.5084	600:	.5472	703:
.3673	425:	.5090	602:	.5479	736:
.3732	341:	.5097	611:	.5485	755:
.3737	333:	.5102	630:	.5491	759:
.3745	314:	.5107	622:	.5512	730:
.3751	317:	.5113	614:	.5517	807:
.3758	322:	.5118	621:	.5521	747:
.3766	322:	.5125	639:	.5528	803:
.3773	325:	.5130	633:	.5534	787:
.3780	319:	.5135	631:	.5539	795:
.3787	330:	.5140	631:	.5547	789:
.3794	325:	.5165	630:	.5553	784:
.3801	312:	.5170	642:	.5558	757:
.3807	313:	.5174	597:	.5564	779:
.4238	340:	.5181	597:	.5577	800:
.4244	340:	.5186	638:	.5582	774:
.4251	332:	.5192	655:	.5588	780:
.4259	346:	.5198	642:	.5593	793:
.4268	326:	.5205	650:	8294.4185	781
.4307	365:	.5211	632:	.4189	780
.4310	352:	.5216	599:	.4196	778
.4316	380:	.5223	632:	.4201	784
.4333	378:	.5228	632:	.4220	784
.4339	365:	.5246	627:	.4225	793
.4349	342:	.5251	634:	.4225	793
.4355	371:	.5255	631:	.4231	786
.4389	380:	.5260	679:	.4237	812
.4398	368:	.5265	653:	.4244	778
.4406	353:	.5270	630:	.4251	765
.4423	326:	.5284	642:	.4269	801
.4430	348:	.5289	675:	.4287	794
.4439	351:	.5294	691:	.4293	765
.4451	375:	.5299	681:	.4300	766
.4467	364:	.5306	655:	.4306	777
.4476	366:	.5313	674:	.4315	762
.4484	404:	.5330	679:	.4323	748
.4496	371:	.5336	662:	.4329	757
.4523	397:	.5341	703:	.4336	778
.4532	410:	.5348	698:	.4393	795
.4542	389:	.5352	702:	.4399	791
.4555	394:	.5357	715:	.4406	757
.4566	396:	.5362	700:	.4411	751
.4573	386:	.5367	711:	.4417	766
.4582	384:	.5373	703:	.4425	759
.4591	395:	.5380	746:	.4430	776
.4598	382:	.5387	726:	.4435	732
.4633	452	.5393	729:	.4443	733
.4646	443:	.5398	750:	.4449	716
.4653	425:	.5416	718:	.4455	746
.4663	434:	.5421	696:	.4462	755
		.5426	731:	.4485	755

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243...	Δm
.4490	718	.4932	440	.5601	357
.4496	717	.4938	447	.5607	364
.4502	714	.4944	444	.5627	341
.4508	722	.4950	451	.5637	328
.4517	695	.5030	463	.5643	341
.4522	712	.5035	467	.5648	347
.4529	712	.5042	463	.5654	334
.4535	710	.5048	467	.5662	355
.4541	700	.5054	450	.5668	340
.4548	678	.5062	449	.5679	324
.4556	676	.5069	437	.5687	335
.4567	680	.5078	436	.5694	342
.4592	648	.5085	460	.5701	342
.4599	652	.5101	471	.5709	352
.4606	660	.5108	469	.5745	332
.4614	656	.5141	470	.5753	335
.4620	661	.5148	441	.5759	335
.4626	660	.5163	418	.5766	328
.4632	622	.5170	438	.5773	345
.4641	621	.5177	446	.5781	339
.4647	593	.5185	459	.5788	352
.4655	618	.5223	467	.5796	339
.4662	630	.5230	445	.5805	338
.4668	625	.5238	466	.5811	339
.4685	596	.5345	368	.5817	341
.4696	593	.5352	369	.5840	350
.4702	576	.5359	370	.5846	351
.4709	599	.5366	350	.5854	354
.4714	594	.5372	346	.5860	355
.4721	606	.5379	346	.5867	352
.4727	567	.5386	362	.5874	362
.4739	554	.5391	361	.5880	366
.4747	552	.5398	362	.5888	346
.4752	569	.5405	369	.5896	346
.4759	548	.5412	366	.5903	352
.4779	515	.5419	375	.5940	346
.4785	509	.5447	372	.5948	351
.4790	508	.5454	374	.5955	364
.4797	530	.5461	372	.5964	343
.4802	523	.5467	355	.5976	375
.4807	534	.5475	378	.5995	364
.4813	514	.5484	368		
.4819	501	.5490	367	8296.3952	757
.4825	525	.5497	350	.3959	770
.4831	510	.5504	370	.3965	767
.4837	507	.5518	362	.3972	748
.4843	518	.5524	374	.3978	731
.4849	512	.5546	351	.3986	735
.4863	518	.5553	358	.3995	722
.4889	486	.5559	359	.4002	718
.4895	467	.5564	354	.4010	716
.4902	479	.5571	358	.4017	714
.4907	468	.5577	366	.4024	699
.4914	464	.5583	368	.4030	694
.4920	465	.5589	365	.4036	674
.4926	438	.5594	346	.4043	669

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.4052	677	.4600	416	.5969	490
.4058	684	.4608	410	.5975	490
.4063	673	.4617	425	.5981	488
.4069	651	.4628	412	.5986	515
.4073	672	.4635	415	.5993	490
.4080	643	.4641	442	.5998	510
.4102	693	.4646	448	.6027	491
.4108	682	.4651	453	.6033	481
.4115	672	.4658	451	.6039	489
.4124	677	.4666	462	.6046	491
.4131	663	.4721	414	.6051	512
.4138	661	.4726	433	.6057	505
.4144	636	.4731	416	.6063	494
.4153	640	.4737	413	.6068	531
.4162	605	.4743	422	.6075	517
.4188	598	.4748	429	.6081	530
.4196	610	.4754	415	.6087	523
.4203	637	.4765	432	.6093	512
.4210	585	.4788	433	.6115	500
.4218	585	.4794	421	.6121	537
.4225	576	.4800	421	.6126	518
.4232	553	.4806	418	.6133	544
.4239	558	.4811	420	.6140	508
.4245	554	.4817	398	.6150	526
.4252	541	.5660	362	.6157	540
.4257	548	.5665	366	.6164	543
.4292	535	.5686	390	.6170	567
.4299	528	.5692	388	.6178	545
.4305	514	.5696	374	.6186	551
.4313	521	.5702	383	.6193	567
.4320	514	.5708	388	.6214	569
.4328	515	.5713	400	.6219	573
.4335	498	.5720	404	.6230	546
.4349	476	.5726	400	.6236	546
.4356	486	.5731	419	.6244	561
.4381	475	.5737	397	.6250	573
.4391	479	.5769	410	.6256	579
.4399	460	.5776	415	.6263	582
.4408	468	.5783	423	.6270	585
.4416	477	.5791	418	.6277	566
.4423	475	.5798	416	.6283	582
.4430	475	.5809	416	.6290	508
.4439	461	.5817	427	.6313	572
.4447	447	.5826	432	.6319	578
.4456	468	.5832	439	.6324	590
.4486	467	.5854	416	.6331	604
.4494	459	.5861	444	.6337	592
.4501	457	.5867	424	.6343	621
.4510	456	.5901	445	.6349	602
.4518	424	.5907	446	.6357	614
.4526	463	.5913	451	.6364	613
.4533	456	.5919	456	.6371	626
.4542	450	.5943	467		
.4551	468	.5950	462		
.4558	455	.5957	479		
.4592	406	.5963	490		

J. D. ☉ 243....	d m	J. D. ☉ 243....	d m	J. D. ☉ 243....	d m
.6378	622	.3708	633	.4468	761
.6404	603	.3719	615	.4478	755
.6412	607	.3729	579	.4489	803
.6418	613	.3738	650	.4498	773
.6424	641			.4508	785
.6431	617	8315.3325	396	.4519	743
.6438	663	.3338	414	.4531	804
		.3349	426	.4543	743
8297.5431	745	.3394	437	.4554	743
.5441	712	.3403	419	.4564	742
.5450	720	.3411	456	.4575	773
.5452	733	.3420	444	.4586	755
.5470	720	.3428	456	.4594	762
.5480	728	.3438	410	.4630	741
.5508	738	.3472	442	.4640	779
.5517	755	.3482	433	.4650	760
.5527	720	.3497	428	.4663	790
.5537	710	.3518	436	.4673	754
.5547	730	.3527	456	.4682	790
.5555	730	.3535	447	.4691	760
.5565	704	.3544	488	.4701	777
.5573	711	.3551	529	.4712	815
.5583	695	.3559	504	.4725	790
.5591	699	.3569	466	.4735	808
.5617	697	.3578	484	.4746	803
.5627	680	.3588	465	.4794	752
.5635	696	.3597	504	.4805	758
.5644	684	.3605	494	.4822	815
.5652	688	.3615	447	.4837	790
.5661	687	.3626	484	.4853	764
.5669	622	.3636	534	.4862	774
.5677	659	.3646	514	.4874	813
.5686	663	.3680	493	.4883	758
.5695	663	.3689	503	.4897	719
.5726	663	.3699	512	.4908	776
.5736	644	.3709	533	.4919	764
.5745	652	.3718	504	.4966	763
.5754	681	.3727	503	.4977	732
.5764	655	.3736	503	.4995	732
.5773	663	.3747	497	.5005	755
.5784	649	.3758	554	.5013	767
.5793	632	.4280	715	.5028	699
.5790	630	.4287	708	.5048	732
.5809	633	.4300	716	.5061	732
		.4308	721	.5071	699
8299.3592	560	.4319	681	.5042	715
.3599	548	.4332	682	.5104	721
.3607	569	.4342	750	.5145	727
.3616	563	.4352	757	.5155	718
.3625	597	.4363	727	.5169	740
.3633	580	.4374	750	.5183	712
.3641	556	.4410	743	.5194	724
.3650	564	.4421	767	.5204	713
.3659	572	.4432	755	.5214	706
.3668	548	.4446	727	.5225	718
.3697	629	.4460	778	.5236	708

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. 243....	Δm
.5249	697	.4591	439	.5402	731
.5265	686	.4602	450	.5416	736
.5279	686	.4616	456	.5459	721
.5292	689	.4678	454	.5473	747
.5311	664	.4687	465	.5492	729
.5328	686	.4694	479	.5509	725
.5391	662	.4705	449	.5523	734
.5406	614	.4713	480	.5537	735
.5424	632	.4726	487	.5551	718
.5435	609	.4746	509	.5566	729
.5449	633	.4754	493	.5579	741
.5460	632	.4769	503	.5593	774
.5470	614	.4783	488	.5664	720
.5480	604	.4802	506	.5681	726
.5489	614	.4812	530	.5694	746
.5498	604	.4823	508	.5707	770
		.4860	525	.5732	836
8316.3139	757	.4878	531	.5746	783
.3147	754	.4895	530		
.3156	756	.4904	529	8319.3208	727
.3163	770	.4927	546	.3217	717
.3173	737	.4934	565	.3226	707
.3180	740	.4949	591	.3234	725
.3190	718	.4958	587	.3241	718
.3198	692	.4969	574	.3248	717
.3206	682	.4980	566	.3255	706
.3216	735	.4991	583	.3262	698
.3335	599	.5002	552	.3269	699
.3344	589	.5034	609	.3275	708
.3351	604	.5043	588	.3282	690
.3360	607	.5050	598	.3288	705
.3369	589	.5057	638	.3296	699
.3379	580	.5064	599	.3302	716
.3393	573	.5074	591	.3310	732
.3446	612	.5086	626	.3332	733
.3455	575	.5097	637	.3339	717
.3464	556	.5107	617	.3345	737
.3473	539	.5120	607	.3351	739
.3479	547	.5131	599	.3359	754
.3486	529	.5143	616	.3366	737
.3492	526	.5156	646	.3373	737
.3499	554	.5169	656	.3380	740
.3506	547	.5180	622	.3386	745
.3514	519	.5221	659	.3393	754
.3520	585	.5235	671	.3415	746
.3533	572	.5248	681	.3426	744
		.5260	690	.3433	745
8318.4455	379	.5272	731	.3440	757
.4466	401	.5285	724	.3446	756
.4475	412	.5298	700	.3453	775
.4485	415	.5314	710	.3460	745
.4504	459	.5331	709	.3466	735
.4515	444	.5346	742	.3473	744
.4546	434	.5361	750	.3480	747
.4557	412	.5374	699	.3501	765
.4577	457	.5386	710	.3508	762

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3517	750	.4013	828	.4778	492
.3529	758	.4044	792	.4809	473
.3538	739	.4053	813	.4817	469
.3546	761	.4061	812	.4825	469
.3553	779	.4067	834	.4836	478
.3560	770	.4074	814	.4857	469
.3566	758	.4081	804	.4869	486
.3573	770	.4088	813	.4880	486
.3579	772	.4095	813	.4890	482
.3605	807	.4102	826	.4899	470
.3613	786	.4109	835	.4931	478
.3622	786	.4116	813	.4940	487
.3631	778	.4123	812	.4951	453
.3637	786	.4130	802	.4961	444
.3644	767	.4157	803	.4972	447
.3652	796	.4164	814	.4982	447
.3659	776	.4171	816	.5017	453
.3666	786	.4178	797	.5029	461
.3675	769	.4187	802	.5042	461
.3683	803	.4194	803	.5054	469
.3690	785	.4201	781	.5067	454
.3697	776	.4209	803	.5077	461
.3704	799	.4215	801	.5087	465
.3711	796	.4223	793	.5107	435
.3736	839	.4231	774	.5120	461
.3744	805	.4238	803	.5136	440
.3751	833	.4247	763	.5149	441
.3757	824	.4255	787	.5161	446
.3764	810	.4281	761	.5170	469
.3771	822	.4290	741	.5210	368
.3778	791	.4306	762	.5220	385
.3784	833	.4317	761	.5230	381
.3791	811	.4327	761	.5245	382
.3798	802	.4355	767	.5258	354
.3804	806	.4541	616	.5269	355
.3811	811	.4568	615	.5282	328
.3817	792	.4579	628	.5295	334
.3825	812	.4587	601	.5307	328
.3848	815	.4598	599	.5317	328
.3855	804	.4606	598	.5326	331
.3862	810	.4616	605	.5339	328
.3869	799	.4627	576	.5496	325
.3874	798	.4657	565	.5505	322
.3884	794	.4668	574	.5515	293
.3920	821	.4677	542	.5524	295
.3929	810	.4685	549	.5534	309
.3935	812	.4694	549	.5544	296
.3944	828	.4702	531	.5556	277
.3953	806	.4709	531		
.3962	855	.4718	539	8322.3952	562.
.3970	844	.4727	524	.3958	537
.3977	828	.4735	511	.3964	529
.3984	812	.4745	503	.3970	524
.3991	813	.4754	492	.3976	545
.3998	821	.4762	492	.3981	545
.4006	812	.4770	492	.3986	562.

J. D. ☉ 243....	4m	J. D. ☉ 243....	4m	J. D. ☉ 243....	4m
.3992	562	.4608	745	.5189	811
.3999	558	.4614	733	.5195	825
.4005	561	.4620	744	.5200	821
.4024	591	.4641	726	.5206	818
.4029	580	.4646	755	.5212	825
.4035	598	.4652	760	.5217	816
.4041	564	.4658	782	.5222	820
.4045	598	.4664	760	.5227	815
.4052	581	.4670	790	.5233	810
.4059	583	.4677	785	.5240	802
.4064	564	.4683	808	.5259	797
.4071	573	.4688	780	.5265	812
.4077	598	.4695	784	.5271	805
.4103	604	.4700	780	.5279	808
.4109	600	.4722	786	.5283	816
.4115	582	.4728	795	.5289	797
.4128	648	.4734	809	.5295	797
.4157	614	.4740	801	.5300	807
.4179	636	.4750	799	.5306	810
.4185	645	.4756	762	.5311	806
.4201	663	.4762	770	.5316	816
.4206	655	.4767	765	.5321	810
.4212	663	.4777	761	.5327	812
.4217	676	.4811	783	.5336	823
.4222	654	.4817	779	.5356	818
.4252	650	.4823	794	.5362	803
.4258	649	.4830	782	.5367	799
.4264	623	.4835	821	.5373	805
.4270	627	.4845	810	.5378	803
.4277	625	.4852	770	.5383	792
.4284	623	.4860	782	.5389	790
.4289	669	.4867	799	.5395	788
.4301	686	.4874	775	.5400	787
.4307	645	.4908	793	.5405	794
.4313	650	.4914	783	.5409	808
.4319	650	.4919	804	.5414	809
.4324	686	.4924	816	.5419	803
.4348	652	.4929	789	.5443	776
.4354	681	.4934	797	.5449	783
.4362	670	.4943	772	.5454	779
.4370	670	.4960	804	.5459	777
.4377	690	.4966	806	.5464	772
.4386	694	.4971	817	.5469	770
.4507	688	.4976	800	.5473	770
.4514	706	.5005	771	.5479	765
.4522	696	.5012	793	.5484	764
.4529	715	.5019	814	.5489	778
.4537	716	.5025	786	.5494	762
.4561	736	.5031	790	.5499	739
.4568	717	.5036	830	.5504	753
.4577	721	.5042	794	.5509	746
.4580	725	.5049	803	.5515	765
.4586	735	.5054	816	.5539	746
.4592	740	.5060	796	.5545	752
.4597	743	.5176	805	.5550	767
.4602	744	.5183	817	.5556	749

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.5562	756	.3324	778	.4005	444
.5567	743	.3332	773	.4029	419
.5573	752	.3340	775	.4039	440
.5578	753	.3348	755	.4046	426
.5583	753	.3358	744	.4054	432
.5588	738	.3366	746	.4062	428
.5595	735	.3777	755	.4089	431
.5600	738	.3388	732	.4097	421
.5607	733	.3414	740	.4105	423
.5632	702	.3424	722	.4115	414
.5638	717	.3436	722	.4125	406
.5643	760	.3446	711	.4131	414
.5650	712	.3457	703	.4151	408
.5655	726	.3468	704	.4158	408
.5661	712	.3477	696	.4184	403
.5667	723	.3487	715	.4191	395
.5673	717	.3496	701	.4198	401
.5679	723	.3508	686	.4205	397
.5685	709	.3532	688	.4212	391
.5689	698	.3542	681	.4220	397
.5695	708	.3553	672	.4251	380
.5715	675	.3562	670	.4261	388
.5720	679	.3573	663	.4269	384
.5727	665	.3586	647	.4278	390
.5732	684	.3596	644	.4286	386
.5738	681	.3606	640	.4317	364
.5743	667	.3615	622	.4326	375
.5749	672	.3625	636	.4334	376
.5754	654	.3649	607	.4341	375
.5757	663	.3659	598	.4351	371
.5763	652	.3676	589	.4379	363
		.3687	582	.4387	363
8323.3056	806	.3698	580	.4397	376
.3064	800	.3709	564	.4407	362
.3070	799	.3719	550	.4415	358
.3078	789	.3729	560	.4441	362
.3085	791	.3739	537	.4450	367
.3092	811	.3750	529	.4465	365
.3119	809	.3778	524	.4474	360
.3127	798	.3788	516	.4480	360
.3135	807	.3798	510	.4496	359
.3144	817	.3807	503	.4534	345
.3152	808	.3819	502	.4542	346
.3183	787	.3829	497	.4551	347
.3189	784	.3839	491	.4559	352
.3197	789	.3849	487	.4567	350
.3204	777	.3858	480	.4595	355
.3212	791	.3868	469	.4604	351
.3221	781	.3924	452	.4611	366
.3244	766	.3936	447	.4624	345
.3252	762	.3947	442	.4636	330
.3260	786	.3957	425	.4642	355
.3267	781	.3966	442	.4651	351
.3275	768	.3976	427	.4556	346
.3309	779	.3985	437	.4664	337
.3316	760	.3997	430	.4670	357

J. D. ☉ 243....	d m	J. D. ☉ 243....	d m	J. D. ☉ 243....	d m
.4676	359	.2856	499	.3386	365
.4682	343	.2863	462	.3393	372
.4688	339	.2870	452	.3399	376
.4709	362	.2877	468	.3405	371
.4715	375	.2882	445	.3411	361
.4722	358	.2973	470	.3417	371
.4728	348	.2979	462	.3427	374
.4734	352	.2985	464	.3433	375
.4741	340	.2991	463	.3440	357
.4748	353	.2998	471	.3446	361
.4756	359	.3005	449	.3451	357
.4762	340	.3010	433	.3457	370
.4769	352	.3017	444	.3478	367
.4777	334	.3024	456	.3484	362
.4787	339	.3030	440	.3490	341
.4826	355	.3036	433	.3496	350
.4835	348	.3046	424	.3503	327
.4844	358	.3067	467	.3510	334
.4854	355	.3073	444	.3518	340
.4866	365	.3079	443	.3548	364
.4873	377	.3086	460	.3555	361
.4881	371	.3093	451	.5193	720
.4945	330	.3098	467	.5200	746
.4953	349	.3105	474	.5208	729
.4963	375	.3112	444	.5214	730
.4975	369	.3118	449	.5232	716
.4983	359	.3124	459	.5239	727
.4990	365	.3131	443	.5244	724
.5001	354	.3153	434	.5249	746
.5033	365	.3159	442	.5253	751
.5051	355	.3167	450	.5260	750
.5063	379	.3173	449	.5265	750
.5079	365	.3180	435	.5271	757
		.3187	427	.5276	762
8325.2942	672	.3194	416	.5283	761
.2952	671	.3200	412	.5305	792
.2961	724	.3207	419	.5348	744
.2970	692	.3213	435	.5354	745
.2979	683	.3240	403	.5374	776
.2989	653	.3261	421	.5380	775
.2999	652	.3266	413	.5387	753
.3012	643	.3272	418	.5392	775
.3023	613	.3277	421	.5398	799
.3032	634	.3283	418	.5403	799
.3060	633	.3288	407	.5409	770
.3066	644	.3295	396	.5415	765
.3072	633	.3300	403	.5422	798
.3078	614	.3306	403	.5428	786
.3084	619	.3313	410	.5435	797
.3091	605	.3319	408	.5441	796
		.3325	408	.5464	794
8327.2823	515	.3331	402	.5470	776
.2830	495	.3337	396	.5475	805
.2837	515	.3343	382	.5481	787
.2844	508	.3362	400	.5487	804
.2850	487	.3378	379	.5491	814

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.5498	825	.6040	819	.2989	364
.5511	839	.6046	847	.2995	354
.5517	813	.6058	858	.3015	347
.5524	816	.6088	839	.3022	332
.5531	804	.6095	804	.3032	348
.5554	819	.6101	815	.3037	347
.5560	806	.6107	816	.3043	342
.5566	838	.6113	838	.3049	325
.5572	828	.6120	837	.3055	314
.5579	827	.6125	849	.3061	326
.5584	828	.6137	814	.3067	321
.5590	829	.6144	826	.3072	312
.5595	827	.6166	782	.3078	337
.5601	826	.6172	786	.3083	348
.5607	812	.6178	793	.3089	308
.5612	851	.6185	806	.3096	341
.5678	840	.6191	816	.3103	334
.5684	816	.6200	831	.3110	300
.5695	842	.6207	795	.3118	348
.5700	824	.6213	823	.3124	331
.5706	785	.6220	807	.3145	328
.5712	793	.6225	811	.3151	331
.5718	828	.6246	791	.3157	328
.5723	842	.6252	802	.3163	357
.5728	829	.6259	796	.3169	328
.5733	822	.6268	804	.3175	345
.5762	826	.6274	838	.3182	324
.5767	835	.6281	815	.3188	314
.5773	846	.6288	813	.3197	328
.5779	855	.6295	803	.3203	293
.5784	856	.6303	804	.3210	299
.5807	842	.6310	814	.3216	293
.5812	831	.6331	756	.3223	314
.5818	828	.6337	751	.3230	293
.5824	830	.6342	762	.3236	299
.5829	831	.6349	796	.3260	321
.5839	843	.6356	734	.3267	327
.5845	852	.6364	773	.3275	334
.5853	878	.6470	762	.3282	327
.5859	865	.6377	762	.3290	327
.5866	831	.6382	760	.3297	333
.5886	845	.6389	751	.3305	336
.5892	844			.3314	334
.5898	846	8329.2910	376	.3321	327
.5904	867	.2916	369	.3594	331
.5908	872	.2919	354	.3600	335
.5914	877	.2928	360	.3605	331
.5919	844	.2934	359	.3611	334
.5926	845	.2940	361	.3617	335
.5932	855	.2946	346	.3622	342
.5938	855	.2953	365	.3628	331
.6009	808	.2959	339	.3633	335
.6014	808	.2965	347	.3638	335
.6019	821	.2961	350	.3644	343
.6027	833	.2978	354	.3649	335
.6034	834	.2983	369	.3655	340

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3661	335	.3893	624	.4765	840
.3667	343	.3929	620	.4774	852
.3688	336	.3938	617	.4782	842
.3693	346	.3946	623	.4792	829
.3699	335	.3954	623	.4801	854
.3705	338	.3962	633	.4826	822
.3711	345	.3970	621	.4836	805
		.3979	660	.4847	799
8330.4848	359:	.3987	661	.4857	800
.4864	356:	.3997	641	.4872	822
.4870	364:	.4007	637	.4882	839
.4875	362:	.4034	692	.4891	822
.4880	370:	.4042	674	.4900	800
.4886	385:	.4050	701	.4909	815
.4891	370:	.4057	694	.4917	833
.4896	399:	.4065	722	.4938	847
.4903	385:	.4073	694	.4947	830
.4909	370:	.4080	687	.4956	841
.4915	385:	.4086	694	.4965	830
.4921	364:	.4097	702	.4976	859
.4926	370:	.4134	642	.4985	841
.4936	335:	.4144	657	.4999	851
.4942	367:	.4371	761	.5012	830
.4947	357:	.4380	788	.5021	841
.4953	352:	.4389	751	.5031	852
.4958	363:	.4399	751	.5055	830
.4964	362:	.4408	756	.5063	818
.4970	355:	.4418	772	.5072	830
.4997	355:	.4427	751	.5080	839
.5003	372:	.4437	763	.5089	838
.5008	367:	.4447	794	.5098	795
.5015	363:	.4457	783	.5110	816
.5352	360:	.4497	792	.5120	850
.5357	360:	.4505	794	.5128	839
.5362	360:	.4513	772	.5137	826
.5368	375:	.4522	804	.5162	798
.5374	368:	.4531	815	.5172	813
.5379	364:	.4539	825	.5181	792
.5386	361:	.4555	791	.5190	804
.5392	364:	.4567	803	.5199	827
.5399	391:	.4577	771	.5207	841
.5405	386:	.4585	803	.5216	838
.5410	406:	.4611	819	.5225	844
.5416	385:	.4620	798	.5237	838
.5421	398:	.4629	821	.5786	506
.5427	401:	.4637	844	.5793	488
		.4647	809	.5801	488
8331.3804	575	.4668	820	.5809	487
.3824	606	.4679	818	.5817	487
.3835	615	.4690	787	.5826	497
.3842	606	.4699	809	.5834	488
.3850	604	.4721	796	.5844	460
.3857	603	.4730	807	.5856	473
.3864	606	.4739	808	.5868	452
.3872	605	.4747	801	.5867	436
.3879	606	.4755	824	.5883	428

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.5913	446	.5370	751	.2842	444
.5921	454	.5506	756	.2850	457
.5937	429	.5516	773	.2859	451
.5946	437	.5523	761	.2896	451
.5956	442	.5531	761	.2906	442
.5966	438	.5539	763	.2915	464
.6008	454	.5548	785	.2934	466
.6020	454	.5555	797	.2944	468
.6129	432	.5562	797	.2951	443
.6136	434			.2960	444
.6144	417	8365.2374	328	.2968	492
.6152	443	.2381	329	.2977	487
.6161	424	.2389	332	.3008	444
.6171	414	.2399	342	.3017	473
.6180	443	.2409	354	.3026	467
.6191	415	.2418	352	.3035	483
.6201	425	.2426	337	.3045	490
.6210	424	.2436	350	.3054	499
.6231	409	.2444	358	.3063	482
.6239	403	.2450	363	.3074	502
.6247	402	.2488	371	.3087	497
.6255	408	.2494	366	.3096	511
.6263	416	.2501	367	.3127	491
.6271	399	.2510	357	.3133	508
.6280	402	.2520	356	.3140	533
.6288	409	.2528	344	.3147	526
		.2537	357	.3153	520
8343.5048	653	.2547	354	.3159	534
.5065	675	.2556	353	.3155	543
.5074	664	.2563	355	.3171	538
.5082	664	.2590	372	.3177	527
.5100	653	.2598	416	.3201	513
.5107	707	.2605	406	.3211	525
.5113	654	.2612	396	.3219	540
.5120	674	.2619	407	.3226	543
.5127	678	.2626	427	.3235	546
.5134	683	.2633	412	.3243	550
.5142	695	.2640	405	.3249	558
.5204	691	.2648	398	.3256	548
.5211	692	.2655	392	.3265	564
.5217	695	.2678	424	.3273	565
.5226	724	.2687	442	.3281	566
.5236	691	.2695	426	.3289	575
.5246	713	.2703	390	.3320	601
.5254	736	.2712	437	.3328	598
.5251	675	.2721	413	.3336	605
.5269	736	.2730	418	.3343	625
.5277	724	.2738	436	.3351	616
.5304	740	.2746	437	.3360	594
.5311	730	.2755	401	.3368	627
.5319	729	.2787	441	.3376	636
.5328	753	.2795	426	.3387	627
.5335	729	.2803	452	.3392	628
.5347	753	.2815	443	.4012	753
.5355	776	.2822	436	.4020	757
.5362	783	.2831	431	.4028	722

J. D. ☉ 243....	4m	J. D. ☉ 243....	4m	J. D. ☉ 243....	4m
.4036	756	.4923	786	.2629	746
.4042	732	.4930	799	.2638	761
.4052	723	.4936	779	.2646	729
.4060	717	.4944	769	.2659	714
.4068	722	.5116	719	.2668	726
.4076	712	.5124	691	.2679	717
.4084	720	.5130	691	.2689	681
.4094	727	.5136	690	.2698	707
.4154	739	.5164	671	.2712	687
.4163	747	.5172	663	.2720	683
.4172	772	.5179	635	.2748	664
.4180	763	.5187	622	.2760	677
.4187	745	.5195	674	.2772	664
.4195	764	.5204	676	.2781	649
.4223	787	.5210	686	.2792	653
.4232	743	.5217	643	.2802	658
.4242	765	.5225	593	.2813	635
.4249	763	.5232	596	.2821	648
.4257	771	.5239	675	.2831	610
.4265	770			.2841	597
.4274	771			.2850	540
.4282	774	8375.2108	836	.2880	599
.4291	775	.2117	818	.2889	593
.4301	765	.2125	807	.2897	573
.4325	797	.2140	812	.2907	567
.4334	794	.2169	828	.2915	542
.4379	780	.2178	835	.2924	547
.4389	795	.2187	860	.2933	542
.4396	765	.2192	834	.2946	505
.4403	800	.2200	828	.2958	516
.4421	777	.2209	815	.2971	527
.4430	798	.2235	824	.2980	480
.4458	806	.2244	827	.2993	504
.4466	790	.2253	851	.3001	516
.4473	818	.2263	835	.3029	444
.4482	783	.2272	805	.3038	479
.4490	813	.2280	787	.3045	477
.4497	741	.2288	812	.3058	469
.4506	765	.2295	802	.3070	455
.4526	818	.2305	829	.3082	456
.4536	801	.2312	811	.3095	452
.4774	792	.2322	835	.3104	444
.4781	796	.2327	822	.3114	466
.4789	800	.2356	839	.3125	456
.4795	801	.2365	834	.3168	411
.4803	798	.2495	768	.3178	404
.4810	819	.2504	775	.3194	405
.4819	826	.2517	697	.3205	387
.4828	815	.2526	739	.3217	412
.4844	819	.2538	758	.3228	417
.4872	770	.2551	750	.3238	424
.4879	765	.2560	758	.3248	423
.4890	782	.2571	721	.3259	410
.4901	787	.2583	751	.3272	407
.4909	813	.2610	738	.3286	415
.4916	791	.2621	723	.3294	425

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3305	391	.4020	336	.4633	440
.3315	398	.4030	319	.4647	447
.3331	420	.4040	340	.4656	464
.3390	389	.4050	348	.4668	434
.3402	374	.4060	343	.4676	448
.3416	395	.4069	332	.4687	470
.3425	390	.4076	336	.4697	479
.3435	374	.4082	345	.4708	488
.3443	371	.4089	345	.4718	486
.3451	366	.4099	339	.4747	519
.3459	373	.4106	340	.4757	454
.3468	372	.4115	337	.4765	455
.3478	365	.4143	337	.4773	470
.3487	378	.4151	347	.4782	502
.3497	365	.4161	351	.4790	551
.3525	374:	.4171	356	.4800	508
.3534	395:	.4180	359	.4810	538
.3544	359:	.4189	348	.4821	513
.3574	387:	.4197	337	.4830	530
.3584	389:	.4206	344		
.3592	372:	.4215	331	8382.3078	626
.3600	397:	.4223	366	.3092	630
.3609	403:	.4230	377	.3102	607
.3617	429:	.4238	341	.3118	611
.3626	406:	.4248	366	.3123	616
.3636	403:	.4278	426	.3133	591
.3646	409:	.4286	345	.3145	574
.3655	408:	.4296	351	.3167	586
.3666	403:	.4306	366	.3178	567
.3675	408:	.4314	355	.3189	580
.3715	400:	.4325	359	.3222	546
.3724	399:	.4353	393	.3236	510
.3735	391:	.4362	386	.3246	529
.3744	392:	.4371	388	.3254	531
.3754	392:	.4380	376	.3259	551
.3764	386:	.4389	404	.3277	537
.3774	365	.4398	404	.3287	518
.3786	363:	.4410	402	.3293	532
.3796	366:	.4442	370	.3302	520
.3807	385:	.4452	398	.3311	517
.3817	386:	.4460	396	.3342	500
.3829	378	.4470	391	.3355	482
.3878	392:	.4478	392	.3362	502
.3886	390:	.4489	389	.3370	490
.3894	392:	.4498	422	.3377	505
.3903	373:	.4508	389	.3396	451
.3912	374:	.4517	400	.3408	466
.3920	387:	.4525	399	.3416	458
.3928	383:	.4533	399	.3426	481
.3937	367:	.4544	435	.3437	461
.3945	346:	.4559	415	.3447	491
.3952	396:	.4567	423	.3456	494
.3961	380:	.4599	401	.3539	418
.3972	352:	.4609	421	.3550	435
.3980	365:	.4617	433	.3560	418
.3988	352:	.4625	416	.3571	421

J. D. ☉ 243....	d m	J. D. ☉ 243....	d m	J. D. ☉ 243....	d m
.3581	438	.3510	368	.4272	505
.3592	443	.3522	352	.4283	537
.3603	450	.3534	343	.4294	533
.3616	423	.3547	333	.4305	529
.3627	418	.3556	333		
.3639	434	.3568	338	8395.2094	514
.3651	422	.3578	333	.2103	502
.3662	449	.3587	351	.2112	513
.3697	418	.3596	313	.2136	480
.3711	403	.3630	332	.2144	493
.3729	399	.3639	331	.2151	485
.3739	431	.3650	338	.2157	511
.3749	422	.3658	343	.2164	484
.3763	368	.3669	326	.2171	493
.3778	383	.3678	331	.2179	485
.3787	376	.3688	326	.2206	450
.3798	394	.3698	339	.2212	471
.3810	396	.3711	352	.2220	480
.3846	345	.3724	359	.2227	477
.3854	338	.3761	356	.2234	473
.3864	366	.3773	341	.2242	454
.3874	372	.3784	371	.2249	458
.3888	359	.3792	364	.2273	437
.3894	368	.3805	357	.2288	456
.3903	341	.3817	350	.2304	468
.3915	370	.3829	380	.2311	442
.3926	341	.3839	368	.2319	456
.3935	332	.3849	396	.2326	455
.3944	337	.3860	368	.2339	448
.3954	332	.3871	391		
.3962	357	.3882	393	8399.2069	335:
.3989	304	.3920	392	.2077	343:
.4000	322	.3937	374	.2085	368:
.4010	324	.3948	394	.2093	333:
.4019	322	.3962	395	.2102	344:
.4030	324	.3976	432	.2110	399:
.4040	328	.3985	402	.2120	333:
.4051	291	.3996	420	.2127	341:
.4062	301	.4003	424	.2138	372:
.4073	323	.4010	402	.2148	337:
8393.3356	335	.4020	405	.2197	329:
.3364	332	.4034	423	.2354	357:
.3374	348	.4047	424	.2364	340:
.3381	354	.4059	433	.2375	342:
.3390	344	.4119	455	.2386	360:
.3400	335	.4132	457	.2396	367:
.3411	344	.4144	455	.2406	364:
.3419	360	.4155	436	.2417	363:
.3428	336	.4167	491	.2426	361:
.3436	349	.4181	468	.2437	401:
.3446	325	.4192	508	.2482	386:
.3455	342	.4201	502	.2492	403:
.3482	346	.4210	514	.2503	379:
.3492	350	.4215	498	.2513	394:
.3501	354	.4224	495	.2522	380:
		.4235	504	.2531	425:

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.2552	413:	.3761	810:	.3587	346
.2562	430:	.3772	776:	.3601	353
.2573	392:	.3783	767:	.3613	340
.2590	442:	.3791	800:	.3669	352
.2598	452:	.3801	793:	.3682	322
.2607	443:	.3810	829:	.3694	320
.2619	438:	.3821	795:	.3705	320
.2629	410:			.3716	355
.2957	526:	8400.2905	481	.3727	361
.2967	525:	.2915	462	.3738	333
.2978	525:	.2923	444	.3748	355
.2998	547:	.2931	441	.3760	359
.3007	512:	.2942	422	.3770	329
.3020	541:	.2950	436	.3783	349
.3031	541:	.2959	458	.3796	324
.3045	530:	.2966	472	.3842	311
.3055	522:	.2973	457	.3850	333
.3063	546:	.2982	464	.3860	310
.3074	558:	.3021	424	.3872	308
.3088	551:	.3030	455	.3884	328
.3138	534:	.3050	452	.3895	334
.3151	524:	.3059	446	.3906	323
.3161	546:	.3070	409	.3919	325
.3172	545:	.3079	424	.3925	320
.3180	587:	.3092	430	.3936	333
.3191	570:	.3103	421	.3946	349
.3201	596:	.3115	459	.3959	318
.3211	610:	.3126	415	.3970	294
.3221	607:	.3137	414	.4021	325
.3242	637:	.3148	402	.4033	309
.3253	645:	.3162	393	.4045	311
.3331	660:	.3174	417	.4057	319
.3353	659:	.3185	413	.4068	337
.3369	668:	.3248	404	.4082	333
.3381	680:	.3261	405	.4095	345
.3391	634:	.3270	407	.4104	336
.3420	658:	.3280	405	.4117	345
.3432	663:	.3292	401	.4127	337
.3442	691:	.3303	395	.4140	342
.3451	690:	.3315	374	.4151	357
.3461	741:	.3330	391		
.3548	705:	.3344	384	8402.3063	381
.3561	740:	.3354	380	.3072	365
.3577	743:	.3368	377	.3082	368
.3589	733:	.3380	403	.3093	374
.3599	748:	.3410	374	.3102	369
.3611	785:	.3418	345	.3115	347
.3621	730:	.3470	367	.3124	352
.3644	776:	.3480	359	.3135	349
.3654	791:	.3492	372	.3145	358
.3666	765:	.3501	360	.3155	355
.3676	770:	.3515	377	.3165	378
.3718	802:	.3534	368	.3176	366
.3729	798:	.3552	348	.3217	347
.3739	760:	.3564	357	.3238	348
.3750	763:	.3577	349	.3249	362

J. D. . . 243. . ⊙	Δm	J. D. ⊙ 243. . . .	Δm	J. D. ⊙ 243. . . .	Δm
.3260	347	4018	445	.2585	797
.3273	342	.4073	497	.2596	760
.3286	328	.4083	462	.2604	743
.3299	329	.4094	457	.2610	748
.3309	364	.4107	476	.2618	755
.3321	343	.4117	473	.2626	759
.3335	373	.4132	472	.2635	736
.3348	358	.4147	503	.2643	759
.3391	336	.4160	510	.2650	753
.3403	318	.4174	489	.2658	775
.3414	325	.4185	490	.2671	756
.3440	318	.4198	493	.2710	708
.3449	323			.2718	700
.3460	323	8406.2503	339	.2725	666
.3471	330	.2507	355	.2733	681
.3481	330	.2515	354	.2740	663
.3488	323	.2522	347	.2747	661
.3496	328	.2530	358	.2754	668
.3504	323	.2537	361	.2761	704
.3557	358	.2544	360	.2768	691
.3566	350	.2550	380	.2775	702
.3576	374	.2557	375	.2782	700
.3585	363	.2564	368	.2789	675
.3592	332	.2571	392	.2797	696
.3603	330	.2577	395	.2806	677
.3614	355	.2583	406	.2840	654
.3621	346	.2589	373	.2850	604
.3632	333			.2863	576
.3643	355	8407.2238	806	.2872	581
.3651	371	.2251	841	.2882	575
.3661	391	.2259	809	.2890	576
.3670	386	.2293	782	.2899	578
.3682	357	.2301	812	.2907	581
.3723	372	.2309	784	.2915	562
.3732	355	.2316	800	.2924	548
.3757	398	.2343	773	.2932	539
.3769	379	.2357	829	.2940	551
.3793	386	.2364	830	.2947	537
.3804	405	.2371	804	.2956	544
.3815	397	.2377	795	.3082	467
.3823	385	.2381	785	.3089	465
.3833	375	.2391	804	.3099	434
.3844	380	.2405	785	.3106	496
.3887	423	.2412	807	.3113	487
.3896	419	.2423	821	.3120	482
.3909	427	.2449	805	.3127	461
.3920	426	.2461	819		
.3930	398	.2469	809	8415.3287	664
.3942	433	.2478	795	.3296	634
.3951	422	.2488	800	.3303	642
.3959	434	.2504	787	.3311	658
.3970	430	.2520	747	.3318	658
.3979	418	.2528	777	.3324	656
.3988	459	.2534	786	.3331	653
.3997	422	.2542	790	.3337	686
.4008	410	.2578	778	.3344	683

J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm	J. D. ☉ 243....	Δm
.3375	674	.3610	724	.3831	792
.3383	691	.3618	720	.3838	793
.3389	666	.3629	737	.3847	797
.3397	664	.3654	727	.3854	782
.3405	672	.3661	734	.3861	787
.3411	662	.3667	743		
.3427	691	.3674	749	8418.3720	405
.3435	688	.3678	758	.3727	377
.3476	695	.3684	743	.3733	408
.3483	704	.3691	734	.3742	397
.3490	695	.3698	759	.3749	394
.3497	705	.3704	737	.3755	403
.3503	716	.3711	747	.3762	426
.3515	730	.3742	748	.3770	400
.3521	701	.3748	754	.3777	402
.3528	720	.3755	742	.3787	408
.3553	730	.3762	747	.3791	422
.3562	736	.3769	743	.3818	425
.3576	716	.3776	769	.3826	452
.3583	710	.3783	749	.3832	459
.3589	706	.3791	766	.3842	452
.3596	714	.3800	782	.3849	466
.3603	724	.3808	776	.3856	484

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