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COMMUNICATION FROM THE OBSERVATORY AT LEIDEN.

Discussion of 122, mostly new, variable stars in or near the constellation Corona Australis,

by *H. van Gent.*

1. This paper is a continuation to *B. A. N.* 227. The 66 variable stars, mostly cluster variables, discussed there were considered to be only a fraction of the variables which could be found on the available plate material. This conclusion was arrived at from the few rediscoveries amongst the objects found by comparing 9 pairs of plates in the blink microscope of the Union Observatory, Johannesburg, South Africa (*B. A. N.* 227, Vol. VI, p. 164). Therefore it was thought worth while to continue the search for variables on the same plate material. For this purpose 22 more pairs of plates have been compared by the writer in the blink microscope of the Kapteyn Astronomical Laboratory at Groningen. The blink microscope, constructed by Zeiss, is in its essential parts fully identical to the one at the Union Observatory, so that the discoveries of variable stars with both instruments can be added together into one homogeneous collection. In total 200 objects were added to the 109 already discovered with the Johannesburg blink microscope. Three of these proved to be identical with two new asteroids which during the search were noted as variable stars too faint to be visible on one plate of the plate pair in examination. A number of objects proved to be only false objects and particles of dust. Some objects were found to be certainly variable but were so faint that they could be estimated only on the best plates of the plate collection, and only when they were in maximum light. They have been excluded from the discussion. When an object after a few estimates turned out to be a long period variable, it was put aside, as the interval of time covered by the series of plates, viz. 2694 days, is too short, and the plates are unfavourably distributed for a good determination of the mean period and the mean light curve for this type of variable. Only when there was a hope of the star being a δ Cep variable with a long period the estimates have been carried out on the whole plate material. In this way 7 long period variables have been estimated on all the plates. For these an exception was made and they have been included in the main list (Table 3). In total 122 variables have been listed; they are distributed over the different types of variability as follows:

97 cluster variables
12 eclipsing variables
7 long period variables
2 δ Cep variables
2 irregular variables
1 SS Cyg type variable
1 ultra short period variable.

2. The results of the comparison of the 22 plate pairs in the Groningen blink microscope have been collected in Table 1. The first column contains the current number of the variable, the second column the type of variability, the third column the plate pair on which the variable was discovered with the indication whether it was found bright on the earlier plate (*e*) or on the later plate (*l*). The fourth column contains the interval between the J. D. Hel. Grw. Astr. M. T. of the two plates and the fifth column gives the observed difference in steps of the brightness of the variable on the two plates. If the variable has been found more than once the plate pairs on which it was rediscovered have been added in the sixth column.

This table is a continuation to Table 1 in *B. A. N.* 227. Three variables of the new list, viz. No. 35, 42 and 221, although rediscovered by me at Groningen, had already been found by me in the Johannesburg blink microscope. A number of the collection of variables in *B. A. N.* 227 have been rediscovered by me at Groningen; an account of these rediscoveries is given in Table 1*a*. This table completes the sixth

TABLE I.

var. No.	type	found on plate pair	Δ*d*	Δ*s*	also found on plate pair
			d	s	
35	cluster	D , l	26·99	10·4	Q
42	cluster	D , l	26·99	7·8	K, W, Y, Z
112	cluster	J , l	·96	9·3	
115	cluster	J , l	·96	8·8	
118	W UMa	J , l	·96	5·8	
119	cluster	J , l	·96	9·7	U
120	cluster	J , l	·96	7·8	
121	cluster	J , e	·96	5·2	
122	cluster	J , l	·96	7·8	
123	cluster	J , e	·96	5·3	W, Z
124	irregular	J , e	·96	9·9	
125	cluster	J , l	·96	11·5	
126	cluster	J , l	·96	5·2	P
128	cluster	K , l	·70	11·5	
130	cluster	K , e	·70	5·1	S
131	δ Cep	K , e	·70	10·3	
133	Algol	K , e	·70	12·5	M
134	cluster	K , e	·70	10·3	S
135	cluster	K , e	·70	2·5	Q, W
136	δ Cep	L , l	1·83	12·3	R, U
138	cluster	L , l	1·83	8·5	
139	cluster	L , e	1·83	7.9	α
141	cluster	L , l	1·83	8·8	
143	cluster	L , l	1·83	10·8	N
144	cluster	L , l	1·83	7·7	
145	cluster	L , l	1·83	9·5	
146	cluster	L , l	1·83	10·8	N, Q, Z
147	cluster	L , e	1·83	10·9	N, T, U, V
149	W UMa	L , l	1·83	4·6	
150	cluster	M , e	4·72	6·2	V
154	cluster	M , e	4·72	8·1	T
155	cluster	M , e	4·72	9·2	O
157	Algol	M , l	4·72	7·8	
160	Algol	N , e	·28	10·7	Q
161	cluster	N , l	·28	>8·5	O, V, W
162	cluster	N , e	·28	10·8	Q, S, Z, α, [β, δ
164	cluster	N , e	·28	9·0	
165	cluster	O , e	1·06	5·1	
167	cluster	O , e	1·06	6·5	
168	cluster	O , l	1·06	11·0	
169	cluster	O , l	1·06	9·0	

var. No.	type	found on plate pair	Δ*d*	Δ*s*	also found on plate pair
			d	s	
170	cluster	O , e	1·06	5·1	
172	cluster	O , l	1·06	4·1	
173	cluster	O , l	1·06	6·8	
174	cluster	O . e	1·06	8·5	V, W
176	cluster	O , l	1·06	10·2	
177	Algol	O , l	1·06	5·1	
179	cluster	P , e	·97	7·0	T
180	cluster	P , e	·97	3·5	
181	cluster	P , e	·97	6·7	
182	cluster	P , e	·97	3·2	α
183	cluster	P , e	·97	6·5	U, δ
184	cluster	P , e	·97	5·3	
186	cluster	P , e	·97	8·5	U
187	cluster	P , e	·97	3·5	
188	cluster	P , e	·97	3·1	U
189	cluster	Q , l	3·74	6·9	
190	cluster	Q , l	3·74	6·8	ε
191	cluster	Q , l	3·74	7·7	
192	cluster	Q , e	3·74	9·8	R
193	cluster	Q , e	3·74	9·1	
194	cluster	Q , l	3·74	8·7	
195	cluster	R , l	·79	7·3	
196	cluster	R , e	·79	8·6	W
198	cluster	R , e	·79	5·4	
199	cluster	S , e	1·21	7·5	V
200	cluster	S , l	1·21	11·7	W
201	cluster	S , l	1·21	9·5	W
202	cluster	S , l	1·21	7·7	
203	cluster	S , l	1·21	5·4	W
204	cluster	S , e	1·21	6·5	γ
205	cluster	T , e	3·98	9·1	δ
206	Algol	T , l	3·98	5·3	
207	cluster	T , l	3·98	9·6	
208	cluster	T , l	3·98	6·6	
209	cluster	T , l	3·98	10·5	
210	cluster	T , e	3·98	8·6	
211	W UMa	T , l	3·98	4·0	U
212	cluster	T , l	3·98	4·9	
213	cluster	T , l	3·98	4·7	δ
214	cluster	T , l	3·98	10·2	
215	cluster	T , l	3·98	5·1	
216	cluster	T , l	3·98	7·2	U, W, Z, ε

var. No.	type	found on plate pair	Δ*d*	Δ*s*	also found on plate pair
			d	s	
217	cluster	T , l	3·98	9·0	
218	cluster	T , l	3·98	6·5	U
219	cluster	T , l	3·98	7·6	
220	cluster	U , l	3·01	7·8	
221	cluster	B , e	4·89	11·0	U
222	cluster	U , l	3·01	12·0	
223	cluster	U , e	3·01	5·9	
224	cluster	U , e	3·01	12·5	
226	irregular	U , l	3.01	5·3	
231	cluster	W , e	2·99	3·0	
232	Algol	W , e	2·99	19·2	
235	cluster	W , e	2·99	8·7	
236	cluster	W , e	2·99	7·5	
237	cluster	W , l	2·99	8·6	
238	cluster	W , l	2·99	8·3	
239	cluster	W , l	2·99	10·4	α
240	cluster	W , e	2·99	8·8	Y
242	W UMa	J , l	·96	3·6	W
245	cluster	X , l	5·30	3·3	δ
246	Algol	X , l	5·30	12·0	
248	cluster	X , l	5·30	5·9	
250	cluster	X , l	5·30	7·9	Y
253	SS Cyg	V , e	8·01	14·7	Y, δ
255	cluster	Y , l	3·08	8·3	
268	cluster	α , l	6·17	2·0	
272	?	α , l	6·17	5·9	
273	cluster	α , l	6·17	5·7	
274	longper.	β , e	14·86	10·0	
277	longper.	β , l	14·86	7·0	
280	longper.	β , l	14·86	7·3	
283	cluster	γ , l	15·85	8·7	
288	longper.	γ , l	15·85	5·0	
300	longper.	δ , e	19·00	3·6	ε
302	Algol	δ , l	19·00	$3^{m}24$	
				s	
303	cluster	δ , l	19·00	4·3	
309	cluster	ε , l	17·85	5·7	
310	cluster	ε , l	17·85	10·1	
312	longper.	ε , l	17·85	6·6	
316	longper.	ε , l	17·85	7·3	

TABLE 1*a*.

var. No.	also found on plate pair	var. No.	also found on plate pair
2	R	48	J
3	β	53	Z
4	Y, δ	57	M, O, T, U
5	M	60	N, R, U
8	Z	61	J, X
9	J	66	P
11	J, L, O, V, ε	67	Z
12	J, α, ε	72	N, R
15	T, W, X	79	T
18	Z	81	M, Z
20	N, S	84	Q
24	S	86	R
30	K	90	K, ε
33	J, N	93	K
43	P	104	X

column of Table 1, *B. A. N.* 227, up to date; together with the sixth column of Table 1 in this paper a complete account of the rediscoveries is obtained for the 66 + 122 = 188 variables of *B. A. N.* 227 and this paper together.

Table 2 contains the J. D. Hel. Grw. Astr. Mean Times for each plate pair and the number of variables found on it. The last column of Table 2 contains the number of variables which had already been found on an earlier plate pair of the list. Table 2 in this paper is a continuation to Table 2 in *B. A. N.* 227; in order to bring this latter one up to date the number of variables found should be increased from 13 to 14 and from 6 to 8 for the plate pairs B and D respectively.

TABLE 2.

plate pair	J. D. Hel. Astr. Mean Greenwich Times of plate pair compared in blink microscope			number of variables found	number of rediscoveries
	d		d		
J	2426561·4594	with	2426562·4211	18	6
K	6563·5266		6564·2308	10	4
L	6561·4809		6563·3119	11	1
M	6562·5070		6567·2228	8	4
N	6562·2492		6562·5285	11	7
O	6565·4490		6566·5134	12	4
P	6566·2765		6567·2443	12	3
Q	6562·4856		6566·2287	12	6
R	6563·4192		6564·2094	9	6
S	6562·2922		6563·5051	11	5
T	6562·2707		6566·2523	21	6
U	6563·2904		6566·2987	17	12
V	5499·3399		5507·3505	7	6
W	5794·5192		5797·5104	20	12
X	5437·2307		5442·5327	7	3
Y	5791·4180		5794·4970	6	5
Z	5441·3790		5442·5770	10	10
α	5385·4398		5391·6051	8	5
β	5507·3723		5522·2362	5	2
γ	5508·3851		5524·2388	3	1
δ	5480·2793		5499·2748	10	7
ε	5420·4951		5438·3471	10	6

3. In Table 3 the right ascension and declination for each variable have been given. They have been derived in the same way as described in *B. A. N.* 227. On pages 49 to 53 diagrams are given of the surroundings for all the variables. At the right hand bottom corner the size of each square in minutes of arc is indicated. The variable has been marked by an open circle; on each diagram the sequence of comparison stars used has been indicated. Variables No. 300 and 316 are in one diagram; they are so close together that the same set of comparison stars could be used for both of them.

Amongst the 188 variables of *B. A. N.* 227 and this paper the following identities with known or suspected variables have been found:

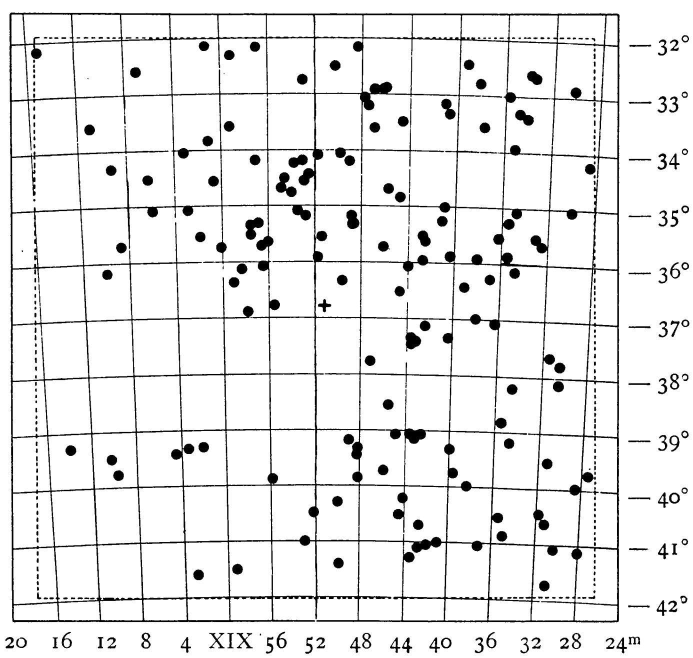
B.A.N. 227		ZINNER [1])		INNES [2])	
var. 5	=	1472	=	48	
4		1475		49	
9					ZZ Sgr
3		1527		70	
18					UV Cr A
11					N.G.C. 6723, BAILEY var. 4
1		1601		165	
98		1635		99	
this paper		**ZINNER**		**INNES**	
var. 274	=	1453	=	40	
283	?	1486		52[a]	
(continued)					
this paper		ZINNER		INNES	
200		1523		69	
310					UW Cr A
186		1548		160	
121	?				AB Cr A
162					N.G.C. 6723. BAILEY var. 15
213					” ” ” 1
214					” ” ” 11
238					CF Sgr
300					VW Cr A
316					VX Cr A
239	?	1593		163	
240					V 413 Sgr
194		1623		170	
302					BQ Sgr
174					V 343 Sgr
135					V 436 Sgr

[1]) *Astr. Abh.*, Ergänzungsheft zu den *Astr. Nachr.*, Bd. 8 No. 1.
[2]) *Union Observatory Circular* 37.

Nearly all the variables are faint and it is not always possible to be sure of the identification. A sketch of the surroundings, as given on pp. 49 to 53, will preclude misidentifications. The periods given by INNES in *U. O. C.* 37 give no clue for the certainty of the identification, as they are often considered by INNES himself as doubtful, the material used by him being not very suitable for the determination of short periods.

The diagram on p. 165 in *B. A. N.* 227 showing the distribution of the cluster variables over the plate field is completed for the cluster variables of the list in this paper, as shown by fig. 1. As several plates

FIGURE 1.



have a slightly different centre, the diagram covers more than the field of one plate. The border of the field of the majority of the plates is indicated by a dotted line.

The cluster variables of *N. G. C.* 6723 have been omitted. The diagram again shows a marked concentration of the cluster variables towards the Milky Way. If a straight line is drawn through the centre of the plate field parallel to the Milky Way, the number of cluster variables on the half of the plate that is nearest to the Milky Way is 114 against 44 on the opposite half. This indicates a strong increase in the space density for these variables when coming nearer to the Milky Way.[1]) It should be remembered however that in the neighbourhood of the irregular variable R CrA there is a region of heavy obscuring clouds extending over several square degrees, which may hide a number of cluster variables lying behind it.

4. About the treatment of the material the remarks made in *B. A. N.* 77 by E. HERTZSPRUNG, in *B. A. N.* 194 by W. E. KRUYTBOSCH and in *B. A. N.* 227 by myself may be referred to.

The total number of estimates used in this paper is 34566 or on the average 283 for each variable. The variables 237, 193 and 126 were estimated also on the series of 308 plates centered on τ Sgr, discussed by FERWERDA in *B. A. N.* 231, these three variables occurring on the overlapping region of the two fields. The total number of photographs examined is $122 \times 397 + 924 = 49358$.

The main data for each variable have been collected in Table 3. The type of variability has been indicated in column 3. The type of the ultra short period variable No. 272 has been considered as uncertain. For several variables with nearly sinusoidal, symmetrical lightcurves it was difficult to be sure whether it is a W UMa or a cluster variable of BAILEY's *c*-type. The number of estimates is indicated in column 4; the period in column 5. When this period was derived by least squares, its mean error has been added. The reciprocal period used in the computing machine to derive the phases of the estimates, has been given in column 6. Column 7 gives the number of epochs used (maxima in the case of the cluster variables, δ Cep variables and the ultra short period variable No. 272, and minima in the case of the Algol and W UMa variables). In column 8 the mean error of a single epoch is given.

The data for the least squares solutions have been collected in Table 5. The table contains the epochs used, the counting of the periods and the values O—C. In the cases of the 4 W UMa variables the odd and the even minima have both been used in the least squares solution; the period derived is the apparent period and should be doubled in order to obtain the period of revolution.

The phases of the observations were computed by the formula: phase = (J. D. — 2420000) × reciprocal period. The observations were then arranged according to phase and means were taken in order to construct the lightcurves, diagrams of which have been given on pp. 54 to 60. An account of this is given in Table 6. The columns contain respectively: the number of observations used in forming the mean; the mean phase; the mean brightness in steps. In the case of the bright variable No. 302 the brightness has been given in magnitudes.

In the case of the W UMa variable No. 242 there was a distinct difference in depth of the odd and the even minima. Accordingly for this variable the phases with odd and even whole number have been separated, and the lightcurve represents the revolution period which is twice the period given in Table 3.

In column 10 of Table 3 the phase of maximum has been given; for the Algol and W UMa variables this number gives the phase of (principal) minimum. If four decimals have been given, this phase has been derived by least squares, assuming the lightcurve to be symmetrical (see *B. A. N.* 147 p. 179).

Sharper epochs can be derived from the rising branches than from the maxima. A point on the rising branch was defined in the way described in *B. A. N.* 227, p. 166. This point is characterized by the difference ΔP between its phase and the phase of the corresponding point of the same brightness on the descending branch. This quantity ΔP has been given in column 9, as well as the phase of the point on the rising branch defined by it.

The period of a few variables proved to be variable. In those cases the light curve is given in Table 6 for the years 1924—1925 (I); 1928—30 (II) and 1931 (III) separately. From these the following quadratic terms have been derived:

var.	quadratic term
	d
143	$-.002 \times 10^{-6}$ E²
155	$+.005 \times 10^{-6}$ E²
176	$-.007 \times 10^{-6}$ E²
184	$+.03 \times 10^{-6}$ E²
200	$-.005 \times 10^{-6}$ E²
222	$+.003 \times 10^{-6}$ E²

In column 12 the maximum and minimum brightness of the lightcurve has been given in steps (zero-point arbitrary) as well as the range in steps. For var. 302 this has been given in magnitudes.

[1]) See also OORT, *B. A. N.* 238 p. 279.

The last column of Table 3 shows the mean error of a single estimate, derived by the formula:

$$\text{m. e. of estimate} = \pm \sqrt{\frac{\Sigma (\Delta s)^2}{2 \times n}},$$

in which Δs is the difference in steps of two estimates following each other in phase and n the number of estimates.

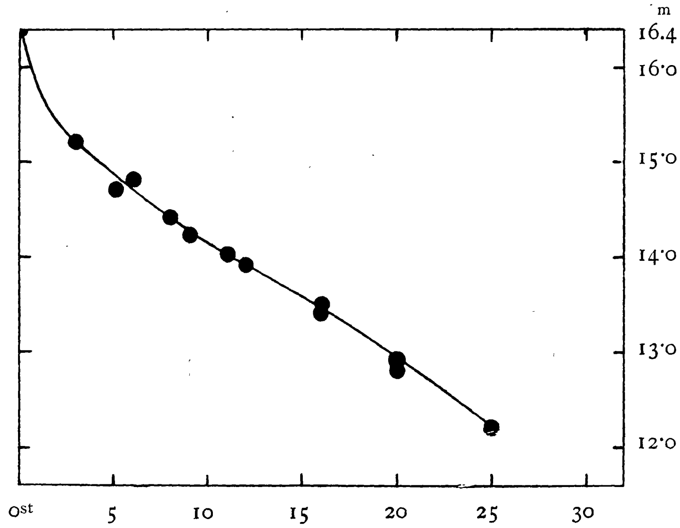
Column 11 contains the maximum and minimum brightness of the variables in magnitudes. In order to obtain these magnitudes the same procedure was followed as given in *B. A. N.* 227, p. 167. The brightness of all comparison stars was estimated in an absolute scale of steps on the same plate as used for this purpose in *B. A. N.* 227 taking the plate fog as zero point. For a number of these comparison stars the magnitude was derived by star counts on the enlargements used for measuring the positions of the variables (size of the enlargements: ·27 square degree). The number of stars brighter than a comparison star were counted and this number was reduced to a square degree and compared with the tables for log $N_{m,\beta,\lambda}$ in *Groningen Publ.* 43. The result is given in the following table:

variable No.	comparison star	brightness in absolute scale of steps	number of stars brighter than comparison star	log $N_{m,\beta,\lambda}$	galactic longitude	galactic latitude	magnitude
							m
160	a	20	32	2·08	330°	— 16°	12·8
	b	16	61	2·36			13·4
	c	11	124	2·66			14·0
	d	8	198	2·87			14·4
	e	5	256	2·98			14·7
274	A	25	18	1·83	328°	— 13°	12·2
	B	20	39	2·16			12·9
	a	16	75	2·45			13·5
	b	12	124	2·66			13·9
	c	9	162	2·78			14·2
	d	6	261	2·99			14·8
	e	3	493	3·26			15·2

The magnitudes were plotted against these estimates in steps in Fig. 2 and a curve has been drawn representing the relation between them. This curve is very similar to the one in *B. A. N.* 227 p. 167; the value of a step expressed in magnitudes has increased slightly however. The relation is linear till about 15^m; from there the value of a step increases rapidly.

The limiting magnitude of the plate is $16^m{\cdot}4$. In *B. A. N.* 235 W. CHR. MARTIN says that the limiting magnitude of the best plates of the series discussed there is about $15^m{\cdot}5$. These plates have been taken

FIGURE 2.



also with the Franklin-Adams telescope with an exposure time of $30^{min.}$, and are of the same brand, viz. Ilford Zenith, as the plates taken in 1928—31 of the series used here, so that the two plate series are fully comparable. Therefore one of the best plates of MARTIN's series was selected by myself and four squares of ½ degree side were taken in the middles of the four squares into which the plate can be devided. All stars visible in them were counted; the total number obtained in this way was 3880 in an area of one square degree. Comparison with the tables of *Groningen Publ.* 43 gives $16^m{\cdot}4$ as the resulting limiting magnitude.

With the aid of the curve in Fig. 2 the estimates of the brightness of the comparison stars in steps from the plate fog have been reduced to magnitudes. These magnitudes are shown in the third column of Table 4.

For the derivation of these magnitudes a difference in limiting magnitude for the plate as mentioned above does no harm, as long as the same plate is used for the determination of the limiting magnitude and for the estimates of the brightness of the comparison stars in steps from the plate fog. It only shows that differences in sensitivity for different emulsions of the same plate brand may lower the limiting magnitude by an amount of nearly a magnitude. This explains why several faint variable stars, when discovered on a set of the most sensitive plates of the series, could not be estimated on the majority of the plates, as mentioned under **1.**

The estimates of brightness of the variables were made in an arbitrary scale of steps, the variable being ordinarily enclosed between two of the comparison stars. Thus each plate yielded a value for the difference in steps between two successive comparison stars. The means of these differences have been taken in order to obtain the brightness in steps for each comparison star of the sequence. These brightnesses have been given in column 2 of Table 4. The zero-point for each sequence is arbitrary.

5. Though the plate material is very suitable for cluster variables, several difficulties were encountered in determining the periods. In the following table the stars are given for which an erroneous period had at first been tried:

Var.	erroneous reciprocal period	correct reciprocal period	difference
	d^{-1}	d^{-1}	d^{-1}
1	3·298	2·298	1·000
5	3·095	2·092	1·003
7	3·223	2·220	1·003
8	2·930	1·927	1·003
13	2·499	1·496	1·003
18	3·116	2·114	1·002
47	2·644	1·642	1·002
48	3·153	2·151	1·002
189	3·0226	3·0198	·0028
208	2·691	1·689	1·002

In the plate material itself three periods are present, viz. the day, the synodical month and the year. If the plates cover only a small fraction of the day, resp. synodical month or year, there is always the possibility that for a variable a wrong period is derived of the type:

$$\frac{m}{P} \pm \frac{n}{P'} = \frac{1}{P''}$$

in which m and n are integers, and P, P' und P'' denote the true period, the period of the plate material (day, month or year) and the erroneously derived period respectively.

The month comes in because with the Franklin-Adams telescope $\left(\frac{O}{f} = \frac{1}{4 \cdot 5}\right)$ no observations could be taken when the moon was brighter than first or last quarter, the plate becoming too much fogged by scattered moonlight in half an hour exposure time and the variables being too faint to be obtained with a considerably shorter exposure time. The observations however generally cover more than half a month at a stretch, plates having been taken when the moon was still or already under the horizon. The year is the least dangerous periodicity, the fraction of the year occupied by observations being considerably more than half. Still in the case of var. 189 it was evidently the period of a year that gave rise to a wrong period. The other 9 cases arose from the daily period in the observations, and are all of the type $\frac{1}{P} + \frac{1}{P'} = \frac{1}{P''}$.

The differences between the two reciprocal periods are not exactly 1, as should be the case when the observations had been taken at intervals of exactly a mean solar day (observations taken at always the same mean time), but in the mean 1·0025. For observations taken at intervals of a sidereal day (observations taken at always the same hour angle) this difference should be 1·0027.

As the observations never extend over more than $10\frac{1}{2}$ hours at a stretch (the greatest eastern hour angle was 5^h02^m, the greatest western one 5^h28^m, both for the middle of the exposure time of a plate), it is the interval of the day that causes most of the troubles in determining the period. From observations all made at the same hour angle (or at the same mean time) it is impossible to derive the right period, as a wrong period of the type mentioned above will give the variable's correct lightcurve with the correct range and no more scattering of the points along the lightcurve than the correct period does. A wrong period of the type $\frac{m}{P} - \frac{n}{P'} = \frac{1}{P''}$ will give a lightcurve which is symmetrical to the lightcurve derived from the right period with respect to the y-axis; for a symmetrical lightcurve (W UMa and Algol type for instance) this will not give a means to detect a wrong period of this type, but for a cluster variable it does.

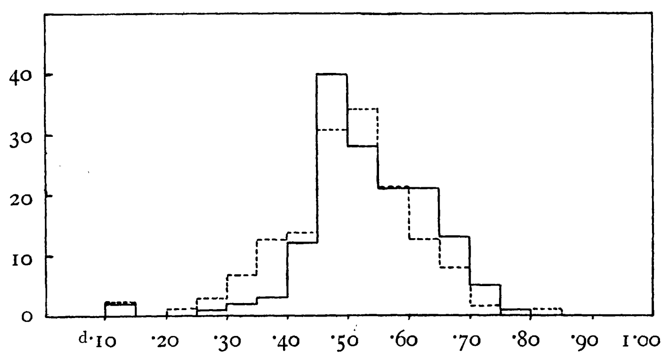
The troubles in determining the period of a variable when the observations have been made at regular intervals are essentially the same as in the case of spectroscopic binaries (see O. STRUVE, *Pop. Astr.* **36**, p. 411). Only observations taken at great hour angles east and west, or, much better, observations from observatories at greatly different longitudes will exclude wrong periods. As regarding the variables discussed in this paper the long series of plates taken during one night (up to $\cdot^d39$ difference between the first and the last plate of the same night, and up to 17 half hour exposures covering $\cdot^d35$ without other interruption than the time necessary for changing plates) proved indispensable in order to sift out the right period, and this measure of precaution cannot strongly enough be recommended.

6. As the number of cluster variables extracted from the plates is so much more complete now than in *B. A. N.* 227, a new comparison was made between the frequency of the periods of the cluster variables in PRAGER's catalogue 1932 and the collection of cluster variables of *B. A. N.* 227 and this paper together. The result is laid down in the following table. The variables in the globular cluster *N. G. C.* 6723 have been omitted.

Interval of period	number of variables in Prager's catalogue 1932	number of variables in Prager's catalogue 1932, reduced to 149	number of variables B.A.N. 227 and this paper
d d			
·10 — ·15	4	2·3	2
·15 — ·20	0	·0	0
·20 — ·25	2	1·1	0
·25 — ·30	5	2·9	1
·30 — ·35	12	6·8	2
·35 — ·40	22	12·6	3
·40 — ·45	24	13·7	12
·45 — ·50	54	30·8	40
·50 — ·55	60	34·3	28
·55 — ·60	37	21·1	21
·60 — ·65	22	12·6	21
·65 — ·70	14	8·0	13
·70 — ·75	3	1·7	5
·75 — ·80	0	·0	1
·80 — ·85	2	1·1	0
	261	149·0	149

From the last two columns a graph (Fig. 3) was drawn showing the two distributions; full line: distribution from this paper; dotted line: distribution from PRAGER's catalogue.

FIGURE 3.



It is evident that the curve of this paper shows a preference for the longer periods. For periods under $^{\mathrm{d}}$·40 my curve has only 8 stars, the curve derived from Prager's catalogue 25·7 stars. For periods above $^{\mathrm{d}}$·60 these numbers are 40 and 23·4 respectively. It is possible that this difference (an excess of 17 stars for periods under $^{\mathrm{d}}$·40 against a shortage of 17 stars for periods above $^{\mathrm{d}}$·60 on a total of 149 stars) is due to wrong periods of the type described under 5 being present amongst the stars in PRAGER's catalogue. As shown by the table on p. 26, when two different periods come into consideration it is the shorter one that is likely to be wrong.

The frequency curve derived in *B. A. N.* 227, p. 168 shows a gap at $^{\mathrm{d}}$·54; this gap has disappeared in the curve derived here. The explanation of this gap is very probably as follows. Of the 57 cluster variables used for the curve in *B. A. N.* 227, 38 variables have been detected by comparing plate pairs with intervals of $^{\mathrm{d}}$·98, 1$^{\mathrm{d}}$·03, 1$^{\mathrm{d}}$·96 and 3$^{\mathrm{d}}$·01. These intervals are so close to 1, 2 and 3 days that stars with a period near $^{\mathrm{d}}$·5 had a very small chance of being detected. This holds especially for the plate pairs with difference $^{\mathrm{d}}$·98 and 1$^{\mathrm{d}}$·03, by which 24 cluster variables were discovered. By also comparing plate pairs taken in very different hour angles (from $-$ $^{\mathrm{d}}$·36 to $+$ $^{\mathrm{d}}$·30 difference in hour angle) and comparing plates with a much longer interval, the material discussed here can be considered much more free from selective effect with respect to the period.

7. The richness of the plate field in cluster variables is conspicuous. Excluding the two ultra short period variables No. 78 and 272, and also the seven variables found in the globular cluster *N. G. C.* 6723, there have been found 147 cluster variables in the region, taking the discoveries of *B. A. N.* 227 and this paper together. The question will now be considered up to which degree the search has exhausted the number of cluster variables present on the plates. An idea can be got about this degree of exhaustion from the number of times that each cluster variable has been independently found. Denoting by α the probability that a variable is detected by comparing one plate pair, and by N the number of variables present in the plate field, all having the same discovery chance, and by n the number of plate pairs compared, the following numbers of variables wil be found 0, 1, 2 ... n times:

$$a_0 = N(1-\alpha)^n \qquad \ldots \text{ 0 times found}$$
$$a_1 = N(1-\alpha)^{n-1}\,\alpha n \qquad \ldots \text{ 1 time found}$$
$$a_2 = N(1-\alpha)^{n-2}\,\alpha^2\,\frac{n(n-1)}{1\,.\,2} \qquad \ldots \text{ 2 times found}$$

etc.

$$a_n = N\alpha^n \qquad \ldots\ n \text{ times found}$$

in which:

$$a_0 + a_1 + a_2 + \ldots + a_n = N$$

Now the discovery chance α will certainly depend on the range of the lightcurve and the apparent magnitude of the variable. The lightcurves were assumed to be identical for the same range, which is a reasonable supposition to simplify the computation. As discussed under 5 the plate pairs have been selected in such a way that preference or avoidance for the discovery of a variable of a certain period may be considered as excluded. By these assumptions α will depend on the range and the apparent magnitude only, so that the collection of cluster variables was divided into groups according to range and magnitude, assuming each group to have the same discovery chance α.

Two numbers of the series a_1, a_2, ... a_n are sufficient to determine the two unknowns α and N, whereas $a_1 \ldots a_n$ are all known observed quantities, so that the problem is "overdetermined". Therefore the discovery chance α and the total number of variables N were derived for each group from the total number of variables found and the average number of times that each of these was found.

The first quantity can be found from the observations by the formula:

$$A_1 = a_1 + a_2 + \ldots + a_n$$

and the second quantity by the formula:

$$G_1 = \frac{a_1 + 2a_2 + 3a_3 + \ldots + n\,a_n}{a_1 + \ a_2 + \ a_3 + \ldots + \ a_n}. \qquad (1)$$

The average number of times that each variable of the group, including the undiscovered ones, was found is:

$$G_0 = \frac{0a_0 + 1a_1 + 2a_2 + \ldots + n\,a_n}{a_0 + \ a_1 + \ a_2 + \ldots + \ a_n} = \alpha n. \qquad (2)$$

From (1) and (2) we see:

$$G_1 = \alpha n \frac{N}{N - a_0} = \frac{\alpha n}{1 - (1-\alpha)^n}. \qquad (3)$$

By this formula α can be computed from G_1.

As $N - a_0 = A_1$, the following formula for N results from (3):

$$N = \frac{A_1\,G_1}{\alpha\,n}. \qquad (4)$$

The number of plate pairs compared was 31. Of these plate pair E with an interval of ^{d}·02 was blinked only in order to find asteroids. Only one variable, No. 30, was found on it by accident. This plate pair has been omitted, so that the computation was made for $n = 30$. This gives the following table representing the relation (3):

α	G_1
·140	4·246
·130	3·961
·100	3·132
·090	2·869
·080	2·614
·070	2·368
·060	2·133
·050	1.910
·040	1·699
·030	1·502
·025	1·409
·020	1·321
·015	1·235
·010	1·154

Of the 147 cluster variables 5 had ranges of ^{m}·6 and ^{m}·5. These 5 stars have all been discovered only once. Applying the formulae (3) and (4) to find α and N, these become 0 and ∞ respectively. This group has therefore been excluded. For the other 142 cluster variables the data have been collected from Table 1 (*B. A. N.* 227 and this paper) and 1*a*. Table 7 gives the groups into which they have been divided according to median apparent magnitude and range, with the resulting values for A_1, $A_1 G_1$, α and N.

TABLE 7.

apparent magnitude		range $2^m·25$ — $1^m·55$	range $1^m·55$ — $1^m·05$	range $1^m·05$ — $^m·75$	range $^m·75$ — $^m·65$
$13^m·25$—$13^m·85$	1 × found:	0 stars	1 stars	2 stars	
	2	0	2	0	
	3	1	1	1	
	4	0	0	0	
	5	1	0	0	
	6	0	0	0	
		$A_1 = 2$	$A_1 = 4$	$A_1 = 3$	
		$A_1 G_1 = 8$	$A_1 G_1 = 8$	$A_1 G_1 = 5$	
		$G_1 = 4·000$	$G_1 = 2·000$	$G_1 = 1·667$	
		$\alpha = ·1314$	$\alpha = ·0540$	$\alpha = ·0384$	
		N = 2·0	N = 4·9	N = 4·3	
$13^m·85$—$14^m·45$	1 × found:	1 stars	6 stars	5 stars	3 stars
	2	5	4	3	1
	3	1	1	0	0
	4	3	3	0	0
	5	1	0	0	0
	6	0	1	0	0
		$A_1 = 11$	$A_1 = 15$	$A_1 = 8$	$A_1 = 4$
		$A_1 G_1 = 31$	$A_1 G_1 = 35$	$A_1 G_1 = 11$	$A_1 G_1 = 5$
		$G_1 = 2·818$	$G_1 = 2·333$	$G_1 = 1·375$	$G_1 = 1·200$
		$\alpha = ·0880$	$\alpha = ·0685$	$\alpha = ·0231$	$\alpha = ·0128$
		N = 11·7	N = 17·0	N = 15·9	N = 13·0

TABLE 7 (*continued*).

$14^m.45—15^m.05$	1 × found : 2 3 4 5 6	range $2^m.25 — 1^m.35$ 13 stars 9 4 $A_1 G_1 = 43$ 0 $G_1 = 1.654$ 0 $\alpha = .0377$ 0 $N = 38.0$ $A_1 = 26$	range $1^m.35 — 1^m.15$ 8 stars 10 1 $A_1 G_1 = 35$ 1 $G_1 = 1.750$ 0 $\alpha = .0424$ 0 $N = 27.5$ $A_1 = 20$	range $1^m.15 — .75^m$ 22 stars 7 0 $A_1 G_1 = 40$ 1 $G_1 = 1.333$ 0 $\alpha = .0207$ 0 $N = 64.4$ $A_1 = 30$	range $.75^m — .65^m$ 3 stars 1 0 $A_1 G_1 = 5$ 0 $G_1 = 1.200$ 0 $\alpha = .0128$ 0 $N = 13.0$ $A_1 = 4$
$15^m.05—15^m.65$	1 × found : 2 3 4 5 6		range $2^m.25 — 1^m.15$ 3 stars 4 0 $A_1 G_1 = 11$ 0 $G_1 = 1.571$ 0 $\alpha = .0335$ 0 $N = 10.9$ $A_1 = 7$	range $1^m.15 — .75^m$ 6 stars 1 0 $A_1 G_1 = 13$ 0 $G_1 = 1.625$ 1 $\alpha = .0362$ 0 $N = 12.0$ $A_1 = 8$	

8. Adding the numbers found for N horizontally from Table 7 the distribution of the cluster variables over the apparent magnitudes is obtained. Taking the absolute magnitude of cluster variables as $^m.0$ ($\pi = ''.1$)[1], the magnitude limits of the groups have been converted into distances in parsecs. The plate field of 10° × 10° records the contents of a square solid angle of 10° × 10° in space, which is divided into 5 sections by the spheres representing the distance limits for the groups. The size of each of these sections in cubic kiloparsecs has been computed.

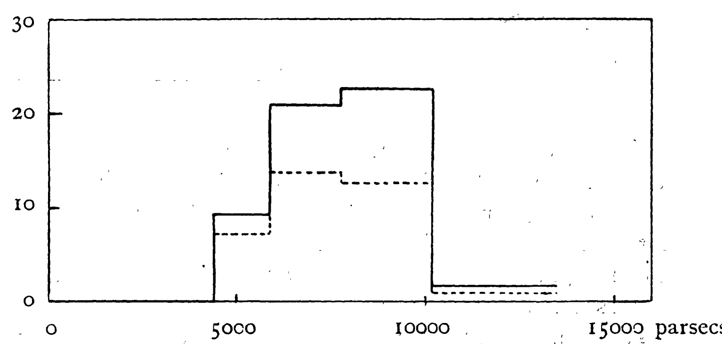
TABLE 8.

median apparent magnitude	distance (parsecs)	volume of section in cubic kilo-parsecs	N	density in var. stars per cubic kiloparsec
^{m} — $13^m.25$	0— 4467	.93	0 (0)	.0(.0)
13.25—13.85	4467— 5888	1.21	1.2 (9)	9.3(7.4)
13.85—14.45	5888— 7762	2.76	57.6 (38)	20.9(13.8)
14.45—15.05	7762—10233	6.32	142.9 (80)	22.6(12.7)
15.05—15.65	10233—13490	14.48	22.9 (15)	1.6(1.0)
15.65—	13490—		— —	— —
			222.6 (142)	

By dividing the number of stars N by the volume of the corresponding section the density of cluster variables in stars per cubic kiloparsec is computed. Table 8 gives an account of this. The numbers when not corrected for incompleteness have been added in parentheses.

In Fig. 4 the density has been given as ordinate, the distance as abscissa. The dotted line represents the density from the uncorrected numbers of cluster variables.

FIGURE 4.



From the figure it is clear that the cloud of cluster variables in the square solid angle represented by the plate field begins at about 4500 parsecs, has its maximum density at about 8000 parsecs, and ends at about 13000 parsecs.

The galactic longitude and latitude of the centre of the region discussed are 327° and — 18½° respectively. This longitude corresponds with the longitude of the centre of the galactic rotation, so that the direction of the region cuts the axis of galactic rotation 18½° south of the galactic plane. If the cloud of cluster variables is spherically situated round the galactic centre, this centre should be at a distance of 8400 parsecs.

It is interesting to compare this result with that obtained by H. SHAPLEY and Miss H. H. SWOPE in *Harv. Reprint* 52 for Milky Way Field 185. This field is situated at $\lambda = 322°$, $\beta = + 8°$, ten degrees closer to the Milky Way than the region discussed in this paper, but on the opposite side of it. SHAPLEY and SWOPE

[1]) SHAPLEY, *Star clusters*, p. 135.

derive a distance of 14400 parsecs for the centre of density of their region; their numbers of cluster variables however have not been corrected for incompleteness and have not been reduced to densities. The first correction will increase their distance, the latter however decrease it considerably. The difference between the brightest and the faintest apparent median magnitudes of the cluster variables mentioned in *Harv. Repr.* 52 is $2^{m}{\cdot}2$; of those discussed in this paper $2^{m}{\cdot}4$, about the same. The field discussed in *Harv. Repr.* 52 covers 70 square degrees; multiplying the numbers for M. W. F. 185 by $\frac{100}{70}$ to make them comparable with the results derived in this paper, the following table is obtained:

photographic median magnitude	number of cluster variables, this paper	reduced number of cluster variables, *Harv. Repr.* 52
m — 13·25	0	0
13·25 — 13·85	9	0
13·85 — 14·45	38	11·4
14·45 — 15·05	80	8·6
15·05 — 15·65	15	41·4
15·65 —	0	50·0
	142	111·4

The average median magnitude of the cluster variables in M. W. F. 185 is $15^{m}{\cdot}9$, in the field discussed here $14^{m}{\cdot}6$, or $1{\cdot}^{m}3$ brighter. This difference is too large to be caused by a difference in zeropoint of the magnitude scales only; very probably absorbtion comes in, and to a much greater extent in M. W. F. 185 than in the Cr A field owing to its smaller galactic latitude.

OORT [1]) derives a distance of 10000 parsecs for the galactic centre; an earlier determination [2]) gives 6300 parsecs; both determinations have been made from rotational effects in radial velocities.

Considerable doubt has been thrown on the zeropoint of the period-luminosity relation (see for instance KIPPER, *A. N.* 5775; GERASIMOVITCH, *A. J.* 951; CECCHINI, *Merate Contrib.* 14), SHAPLEY's absolute magnitudes, also adopted by me, being about $1{\cdot}^{m}1$ too bright. This would mean that all distances derived by the period-luminosity relation have to be reduced by a factor ·6. The point of greatest space density for cluster variables as derived here would consequently be reduced to 5000 parsecs distance.

If any sensible absorbtion has to be taken into account, this number has to be decreased further.

9. The numbers N obtained in Table 7, when added vertically, give the frequency of the cluster variables as a function of their range. As the limits in range do not correspond for the groups of Table 7, the distribution has been assumed to be uniform in each group. Adding the numbers N under this assumption the following table results:

TABLE 9.

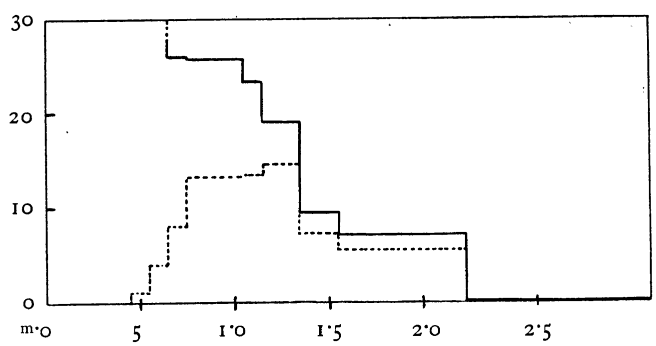
range	number of variables per $^{m}{\cdot}1$ range	number of variables per $^{m}{\cdot}1$ range, uncorrected
m m 2·25 — 1·55	7·2	5·4
1·55 — 1·35	9·2	7·3
1·35 — 1·15	19·2	14·4
1·15 — 1·05	23·5	13·3
1·05 — ·75	25·8	13·2
·75 — ·65	26·0	8
·65 — ·55	—	4
·55 — ·45	—	1

The data for the 5 stars with a range of $^{m}{\cdot}6$ and $^{m}{\cdot}5$, though not included in Table 7, have been added in Table 9.

In Fig. 5 these numbers are represented graphically; full line: column 2 of Table 9, dotted line: last column of the table.

The figure clearly shows the bad influence of a

FIGURE 5.



small range upon the discovery chance and consequently upon the completeness. The dotted line shows a maximum frequency at a range of $1^{m}{\cdot}25$; the full line strongly suggests that the maximum frequency occurs for a range smaller than $^{m}{\cdot}7$, so that the maximum of the dotted curve at $1^{m}{\cdot}25$ is only due to the small ranges having a very small discovery chance. The mean range for the 147 cluster variables discussed here is $1^{m}{\cdot}16$, exactly the same value as obtained by STICKER (*Zs. f. Astroph.*, Bd. 2, p. 393) from PRAGER's catalogue 1931.

The full line is rising continually from range $2^{m}{\cdot}25$ to $^{m}{\cdot}65$. The existing part of the frequency curve would even not preclude the value $^{m}{\cdot}0$ for the maximum frequency. This latter value might mean: all stars are

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[1]) *B. A. N.* 159, p. 279.
[2]) *B. A. N.* 132, p. 88.

cluster variables, but only those with fairly large ranges have so far been discovered. The drawn part of the full curve represents 224·6 cluster variables; the total number of stars in the plate field till $15^{m}\cdot65$ is about 200 000, so that the missing part of the curve between $^{m}\cdot0$ and $^{m}\cdot65$ would have to procure the remainder, about 199 800 variables. This is improbable; the curve can however have a maximum at $^{m}\cdot0$ and contain only a part of the 200 000 stars brighter than $15^{m}\cdot65$ in the plate field — for instance only the stars of spectral types A and F. All known cluster variables belong to these two types, except one or two of type B 9.

GERASIMOVITCH (*Zs. f. Astroph.* Bd. 2, p. 85) discusses the frequency curve of the ranges of δ Cep variables. For those with a period between 1^{d} and 10^{d} he finds, after correction for incompleteness, a maximum for a range of $1^{m}\cdot10$ (*loc. cit.* p. 93). It should be well remembered that GERASIMOVITCH's correction factors are derived in a geometrical way, and assuming a threshold value ε of $^{m}\cdot5$ for the difference in brightness on two plates necessary to discover the variable (see also *C. R. de l'Ac. des Sc. de l'U. R. S. S.*, 1931, p. 93). The corrections in this paper are derived from the data in Table 1 and are, contrary to GERASIMOVITCH's correction factors, empirical ones. Comparison between the values derived for the discovery chance α in Table 7 and the ones derived by GERASIMOVITCH (*loc. cit.*, p. 96) shows that the values derived in Table 7 are exceedingly small. Consequently after the 30 comparisons stated in Table 2 only 63 percent of the cluster variables with ranges over $^{m}\cdot65$ have been found, whereas GERASIMOVITCH states: "in an ideal case practically all Cepheids are fished out after the examination of 4—5 pairs of plates" (*loc. cit.*, p. 97). The explanation of this is not a very high threshold value ε for the 30 plate pairs blinked here (compare the values Δs in Table 1), but the fact that many variables, although having a difference in brightness on a set of two plates greater than ε, remain undiscovered because they are simply overlooked. Thus the values for the probability of discovery α in Table 7 are the geometrical probabilities multiplied by a factor smaller than 1 depending on the attention and speed with which the plates were compared.

10. The statistical results obtained under 8 and 9 suggest the following desiderata for future investigation of the great cloud of cluster variables that is obviously present at galactic longitude 325°.

In the first place fainter variables should be included in order that the curve of Fig. 4 can be extended to greater distances and the decrease of the space density for the cluster variables at great distances can be better shown. For this purpose the plates should penetrate one or two magnitudes deeper; unless much faster plates can be obtained a bigger lens than the Franklin-Adams one ($a = 254$ mm) will be required for this. It is dangerous to try to obtain the same result by making the exposure time much longer than $30^{min.}$, as the range of the variables as shown by the plates will decrease as the exposure time increases.

To extend the frequency curve of Fig. 5 to smaller ranges a procedure should be found by which also variables with small ranges should have a good probability of discovery. By plates showing stars one or two magnitudes fainter than the plate material discussed here the majority of the cluster variables would be brought into a steeper part of the gradation curve, which will increase their probability of discovery. Another helpful measure might be found in using plates with a very steep gradation and developing them with hard developers. In the blink microscope only the best plate pairs with best similarity of images should be compared.

11. Several of the lightcurves shown on pp. 54 to 60 and p. 181 to 184 in *B. A. N.* 227 show a small decrease in brightness directly before the rise.

BAILEY's types *a* and *b* (*Harv. Ann.* 38, p. 132) cannot be separated according to period; amongst the periods above $^{d}\cdot4$ both types occur at random. The periods under $^{d}\cdot4$ however are all of BAILEY's type *c* and have all small ranges.

Comparison of the lightcurves of variables of small ranges with those of great ranges shows that the fraction of the period occupied by the rising branch is the smaller, the greater the range of the variable is.

The same remarks are made by GROSZE (*A. N.* 5901) in a discussion of the cluster variables in the globular cluster Messier 53; this again shows that there is no difference in behaviour for cluster variables whether they occur in globular clusters or are separate individuals far from any cluster.

12. The individual variables give rise to the following further remarks:

Var. 123, 154, 162, 213, 214. These variables are situated in the globular cluster N. G. C. 6723 = Δ 573, together with var. 11 and 12 of *B. A. N.* 227. On the maps of their surroundings the dense part of the cluster is marked by a circle. The mean of the median magnitudes of these 7 variables is $14^{m}\cdot8$, corresponding to a distance for the cluster of 9100 parsecs. In SHAPLEY's list (*Star Clusters*, p. 227) the distance is given as 12300 parsecs. On the plates (scale: 1 mm. = 183″)

the cluster is very crowded and the estimates were difficult and influenced by stars close to the variable. The identifications with BAILEY's variables (p. 23) could easily be made with the aid of *Harvard Annals* 38, plate XI.

Var. 124. This variable is irregular. Considerable time has been spent to find a period but without success. The maxima are unequal in brightness. The variability is unquestionable, the range being over 2^m.

Var. 131, 136. These variables have the uncommon periods of $1^d \cdot 0$ and $1^d \cdot 1$ respectively; the latter one has an exceptionally great range.

Var. 135, 240. These variables, although occurring on the overlapping part of the regions mentioned under 4 have been estimated on the 397 Cr A photographs only. This was done on purpose to be fully independent from FERWERDA's results for these two stars, which are identical with his variables x and l respectively (*B. A. N.* 231). Comparison shows that the lightcurves as found in the two investigations are very similar. The value of a step as found from Table 3 is slightly smaller than FERWERDA's value. The periods, though derived independently from two entirely different series of plates, correspond to the sixth decimal. The apparent magnitudes as derived by FERWERDA (by comparison with Selected Area 159) are however about 1^m brighter than those derived here.

Var. 141. Two separate least squares solutions were made with the epochs given in Table 5, representing the maxima brighter than comparison star b and equal to b respectively. The two resulting periods were $^d.5144936 \pm {}^d\cdot 0000024$ and $^d\cdot 5145022 \pm {}^d\cdot 0000047$ respectively. The weighted mean was taken in order to obtain the period given in Table 3.

Var. 146, 217. A faint star is situated close to the variable; only in minimum the two stars are separately visible. In maximum the disturbing star is absorbed in the image of the variable. Consequently the range should be slightly decreased.

In cases where the disturbing star is too close to be seen separately even in minimum, only the combined brightness can be estimated. The effect will be that the derived lightcurve is incorrect and should be increased in range. Especially the minimum suffers a certain amount of flattening. It is impossible to distinguish these cases from the lightcurve alone; an elongation of the image, especially in minimum, is the only indication by which the variable's lightcurve and range can be distrusted.

Var. 162. Close to the variable is a bright star; the images are in contact when the variable is bright, which may have affected the estimates.

Var. 204. The maxima are certainly unequal in brightness.

Var. 226. A period of about $3\frac{1}{2}^d$ was tried, but proved unsatisfactory. Nothing better could be found. The star is an irregular variable.

Var. 253. This star is an irregular variable of the SS Cygni type. No definite period could be found. There are long maxima, which last about 8^d, and short maxima of one day only.

Var. 272. This variable has a period of $^d\cdot 1076$ only. The 5 variables with shortest known periods, [1]) all due to the collaboration between Johannesburg and Leiden, are now:

	period	author	*B. A. N.*
VV Pup	·0697	VAN GENT	214
KU Cen	·0800	MARTIN	232
$19^h\ 2^m 58^s \cdot 5 - 35^\circ\ 5' \cdot 7$	·1076	VAN GENT	243
AI Vel	·1116	HERTZSPRUNG	224
AQ CrA	·1187	VAN GENT	227

Var. 280. A period of 64^d succeeded to represent all the observations satisfactorily, except those of the year 1925. Nothing better could be found.

Var. 302. Of this Algol variable 6 minima have been found. The counting of the periods was in full agreement with the epoch and period derived in *Harv. Circ.* 238 by IDA E. WOODS and MARTHA B. SHAPLEY. The number of minima and the interval of time covered by the plate material used by these autors was much greater than that used here. Moreover no observations were found to be on the steep parts of the rising and falling branches, so that there was no hope of improving the Harvard period by the aid of the present material. Consequently the period of *Harv. Circ.* 238 was used to derive the phases. The magnitude scale for the comparison stars was derived by the aid of estimates on a plate with two exposures of equal length taken with and without grating respectively. The difference in magnitude between free lens exposure and first order grating image was assumed to be $2^m.5$; as compared with the magnitudes used in *Harv. Circ.* 238 the relation between the Harvard scale and the one here proved to be linear, $1^m \cdot 00$ Harvard scale being equal to $1^m \cdot 06$ scale of this paper. The range of the variable was found to be $3^m \cdot 4$; the range given in *Harv. Circ.* 238 is $2^m \cdot 84$. Owing to the brightness of the variable the mean error of a single estimate is very small, only $\pm {}^m\cdot 035$.

The periods given for the Algol variables are all the periods of the light variation. In the cases of var. 177 and 206 the possibility exists that these have to be doubled in order to obtain the revolution period.

[1]) The period of about $^d\cdot 06$ for ε^2 Lyrae, derived by E. A. FATH (*Pop. Astr.* 40, p. 88), is still open to doubt.

I want to express my thanks to prof. E. HERTZSPRUNG, who derived many of the periods, to prof. P. J. VAN RHIJN for his permission to use the Groningen blink microscope and to prof. R. PRAGER for comparing the list of variable stars in this paper with his card catalogue. Mr. KOOREMAN has measured the positions of the variables, Mr. DE HAAS has made the drawings for the diagrams; both had a large share in the computing work for the least squares solutions.

TABLE 3.

Var. No.	α (1875)	δ (1875)	type	number of estimates	period	m. e.	reciprocal period	number of epochs	m. e. of single epoch	phase of rising br. ΔP		phase of max.	max.	min.	max.	min.	range	m. e. of single est.
	h m s	° ′			d	d	d⁻¹		d	P	P	P	m	m	st	st	st	st
42	18 27 34·0	— 39 44·7	cluster	347	·4683532	±·0000016	2·135141	19	± ·010	·03	·25	·11	12·7	14·4	·87	16·81	15·94	± 1·10
226	18 27 49·7	— 39 8·6	irregular	361									12·6	14·7	—3·0	14·6	17·6	
205	18 28 1·5	— 41 11·7	cluster	235	·5985054	±·0000024	1·670829	14	± ·013	·28	·25	·35	14·1	15·3	5·72	15·11	9·39	± 1·06
253	18 28 19·4	— 37 31·7	SS Cyg	286									13·9	15·6	3·3	19·9	16·6	
136	18 28 27·9	— 38 10·4	δ Cep	329	1·1276457	±·0000071	·88680	17	± ·026	·22	·30	·29	12·3	14·6	·88	21·55	20·67	± 1·57
112	18 28 49·9	— 39 56·8	cluster	241	·6566548	±·0000044	1·52288	30	± ·028	·63	·30	·72	14·0	15·1	2·44	14·07	11·63	± 1·57
231	18 29 21·1	— 34 17·7	cluster	204	·5631243	±·0000057	1·775807	15	± ·024	·82	·25	·88	14·6	16·2	4·97	11·30	6·33	± 1·15
232	18 30 18·3	— 37 32·3	Algol	377	11·36545		·087986					·0953	13·1	14·8	6·71	26·53	19·82	± ·54
165	18 30 18·8	— 35 3·6	cluster	200	·4624318	±·0000017	2·162481	14	± ·012	·59	·25	·66	14·5	16·4	1·45	7·30	5·85	± ·87
179	18 30 24·6	— 41 13·2	cluster	276	·5424889	±·0000045	1·843356	10	± ·025	·90	·30	·99	13·9	15·1	3·96	12·35	8.39	± 1·47
195	18 30 39·4	— 37 44·9	cluster	255	·5470096	±·0000035	1·828122	13	± ·023	·04	·25	·10	14·3	15·4	2·72	10·05	7·33	± 1·03
150	18 30 39·7	— 38 12·2	cluster	275	·4904128	±·0000014	2·039099	19	± ·010	·46	·25	·53	14·0	15·1	2·82	12·67	9·85	± 1·19
274	18 30 51·3	— 33 54·4	longper.	290									11·9	16·2	—3·0	28·5	31·5	
128	18 31 37·2	— 40 37·6	cluster	210	·5887684	±·0000023	1.69846	5	± ·009	·01	·30	·07	14·5	15·5	4·26	13·92	9·66	± 1·74
138	18 33 41·3	— 35 39·2	cluster	236	·5854805	±·0000036	1·708	9	± ·018	·05	·25	·08	14·5	15·2	4·41	11·30	6·89	± 1·46
283	18 34 24·9	— 33 24·0	cluster	207	·4572386	±·0000034	2·187042	8	± ·013	·70	·20	·75	14·9	16·4	3·67	11·40	7·63	± 1·22
177	18 34 34·9	— 37 13·2	Algol	350	2·409662		·414996					·64	14·0	14·6	5·30	9·63	4·33	± ·83
207	18 35 14·5	— 38 50·7	cluster	262	·4826170	±·0000016	2·072036	11	± ·012	·45	·20	·49	14·1	15·3	4·83	14·68	9·85	± 1·51
220	18 35 34·8	— 35 53·9	cluster	234	·4800885	±·0000022	2·082949	12	± ·011	·19	·20	·27	14·2	15·5	2·72	11·10	8·38	± 1·02
139	18 35 42·7	— 35 20·7	cluster	252	·5416333	±·0000020	1·846268	19	± ·014	·23	·20	·29	14·3	15·5	5·33	18·45	13·12	± 1·38
199	18 35 43·4	— 40 39·2	cluster	235	·4432499	±·0000018	2·256064	12	± ·012	·88	·25	·94	14·4	15·3	7·02	14·70	7·68	± 1·27
206	18 35 56·2	— 35 10·3	Algol	315	2·247540		·444931					·7423	14·2	14·7	5·96	11·87	5·91	± 1·00
221	18 36 34·6	— 35 34·1	cluster	284	·4579511	±·0000018	2·183639	14	± ·014	·28	·25	·38	14·1	15·5	1·62	14·13	12·51	± 1·75
208	18 36 35·1	— 37 6·2	cluster	266	·5922067	±·0000034	1·688600	11	± ·016	·69	·25	·75	14·4	15·5	1·78	11·09	9·31	± 1·28
209	18 37 42·0	— 36 15·5	cluster	268	·5242381	±·0000033	1·907530	24	± ·018	·27	·25	·32	14·2	15·6	3·63	14·22	10·59	± 1·22
277	18 38 0·4	— 38 7·7	longper.	84									13·5	16·4	2·0	18·9	16·9	
222	18 38 38·1	— 35 58·2	cluster	284	·5800326	±·0000040	1·724041	24	± ·023	·44	·30	·51	13·9	15·1	3·11	14·07	10·96	± 1·20
115	18 38 39·6	— 32 49·4	cluster	277	·5905392	±·0000028	1·693368	19	± ·018	·50	·25	·55	13·4	14·6	5·93	17·23	11·30	± 1·12
130	18 38 46·6	— 40 0·8	cluster	300	·4604108	±·0000013	2·171973	23	± ·013	·62	·25	·67	13·8	15·3	4·61	16·31	11·70	± 1·20
245	18 39 41·1	— 32 29·8	cluster	273	·6587352	±·0000067	1·518061	15	± ·029	·08	·30	·14	14·1	15·0	5·36	13·07	7·71	± 1·27
189	18 39 45·2	— 39 45·2	cluster	324	·3311464		3·019812			·59	·55	·80	14·1	14·7	6·10	13·32	7·22	± 1·59
168	18 40 08·4	— 39 33·1	cluster	267	·4815783	±·0000018	2·076505	31	± ·017	·28	·25	·34	13·8	15·2	1·38	12·92	11·54	± 1·49
141	18 40 34·5	— 35 51·6	cluster	203	·5144954	±·0000021	1·943652			·76	·20	·81	14·6	15·7	5·90	15·93	10·03	± 1·20
268	18 41 10·3	— 33 3·9	cluster	262	·7117164	±·0000064	1·405054	6	± ·017	·40	·35	·50	14·3	15·2	4·49	10·89	6·40	± 1·12
309	18 41 57·0	— 41 1·1	cluster	239	·4810838	±·0000022	2·078640	18	± ·017	·30	·25	·37	14·7	15·3	6·00	13·40	7·40	± ·92
167	18 42 25·2	— 37 9·5	cluster	288	·6124905	±·0000082	1·63268	9	± ·031	·11	·35	·24	14·1	15·1	5·96	13·45	7·49	± 1·45
200	18 42 30·6	— 35 35·2	cluster	292	·4778794	±·0000023	2·092578	18	± ·017	·65	·20	·70	13·9	15·1	3·68	14·90	11·22	± 1·26
235	18 42 33·4	— 41 6·4	cluster	273	·6556387	±·0000036	1·525230	9	± ·018	·84	·25	·90	14·4	15·4	2·98	11·67	8·69	± 1·03
180	18 42 34·2	— 39 6·3	cluster	258	·4437775	±·0000020	2·253381	22	± ·019	·27	·25	·34	14·3	15·3	3·08	11·39	8·31	± 1·51
176	18 42 37·7	— 40 41·0	cluster	221	·5057266	±·0000038	1·977353	15	± ·026	·80	·25	·88	14·5	15·5	1·38	8·30	6·92	± 1·14
223	18 43 11·6	— 37 27·0	cluster	303	·4833536	±·0000022	2·068879	22	± ·017	·44	·20	·48	14·0	15·3	·18	11·70	11·52	± 1·16
181	18 43 48·8	— 39 4·8	cluster	281	·6092638	±·0000055	1·641325	18	± ·036	·15	·45	·29	14·2	15·0	4·24	10·94	6·70	± 1·14
310	18 43 53·1	— 37 29·4	cluster	305	·5159405	±·0000021	1·938208	25	± ·018	·51	·25	·57	13·6	15·0	·79	13·17	12·38	± 1·16
201	18 43 59·9	— 36 5·8	cluster	258	·5253633	±·0000027	1·903445	19	± ·019	·15	·25	·21	14·3	15·6	2·21	11·51	9·30	± 1·24
182	18 44 3·9	— 40 17·6	cluster	325	·3337360		2·99638			·10	·50	·31	14·2	14·9	5·39	10·09	4·70	± 1·38
211	18 44 20·9	— 38 58·2	W UMa	277	·2040833		4·89996					·87	14·5	14·9	5·80	9·88	4·08	± 1·13
160	18 44 39·3	— 33 45·5	Algol	375	1·641569	±·000010	·609173	5	± ·014			·7086	13·4	14·4	5·84	16·52	10·68	± ·91
210	18 44 55·8	— 34 49·5	cluster	279	·6014340	±·0000027	1·662693	9	± ·014	·89	·25	·95	13·6	15·1	1·18	14·31	13·13	± 1·23
169	18 44 58·1	— 33 31·0	cluster	207	·4862863	±·0000064	2·056402	20	± ·033	·30	·30	·40	14·6	15·5	3·58	10·46	6·88	± 1·34
118	18 45 1·0	— 40 11·9	W UMa	302	·4065867		2·4595					·96	14·2	14·8	6·80	12·62	5·82	± 1·74
170	18 45 9·5	— 36 31·8	cluster	238	·6311588	±·0000030	1·584387	21	± ·021	·00	·25	·08	14·6	15·3	3·92	12·00	8·08	± 1·32
280	18 45 12·2	— 39 58·1	longper.	340									13·7	15·2	1·6	12·2	10·6	
183	18 45 17·3	— 39 6·2	cluster	294	·4590166	±·0000017	2·178571	18	± ·010	·98	·20	·04	14·2	15·6	4·11	15·49	11·38	± 1·33
224	18 45 52·5	— 38 34·9	cluster	369	·4709644	±·0000017	2·123303	18	± ·013	·80	·30	·87	13·2	14·2	·60	13·76	13·16	± 1·02
35	18 46 27·1	— 35 43·5	cluster	291	·5237549	±·0000039	1·90929	16	± ·021	·79	·25	·86	13·4	14·7	·81	14·52	13·71	± 2·03
236	18 46 27·4	— 32 56·6	cluster	192	·5124514	±·0000083	1·951404	12	± ·020	·37	·20	·41	14·6	15·5	5·07	11·10	6·03	± 1·10
288	18 46 27·9	— 36 51·8	longper.	269									13·9	15·4	—1·0	10·4	11·4	

TABLE 3 (*continued*).

Var. No.	α (1875)	δ (1875)	type	number of estimates	period	m.e.	reciprocal period	number of epochs	m. e. of single epoch	phase of rising br.	ΔP	phase of max.	max.	min.	max.	min.	range	m. e. of single est.
	h m s	° ′			d	d	d⁻¹		d	P	P	P	m	m	st	st	st	st
246	18 46 35·0	— 37 58·6	Algol	368	1·919673		·520922					·3869	13·6	14·9	3·97	19·00	15·03	± ·80
184	18 47 1·3	— 33 37·6	cluster	243	·629525		1·5885			·22	·30	·33	14·7	15·5	8·22	12·91	4·69	± 1·49
119	18 47 6·6	— 32 56·4	cluster	276	·4341090	± ·0000010	2·303569	25	± ·010	·92	·20	·96	13·3	15·0	3·07	16·42	13·35	± 1·37
186	18 47 31·1	— 33 15·1	cluster	256	·5916755	± ·0000024	1·690116	17	± ·017	·72	·25	·78	14·2	15·4	3·05	12·07	9·02	± 1·33
161	18 47 53·3	— 33 3·8	cluster	267	·6549941	± ·0000032	1·526731	14	± ·018	·18	·20	·23	14·2	15·3	1·91	9·77	7·86	± 1·03
121	18 48 20·3	— 39 30·7	cluster	302	·6745818		1·4824			·64	·35	·75	14·0	15·0	4·70	15·87	11·17	± 1·69
212	18 48 20·8	— 39 21·5	cluster	262	·5225518	± ·0000023	1·913686	15	± ·016	·59	·25	·64	14·4	15·2	4·02	11·05	7·03	± 1·20
237	18 48 30·9	— 32 11·8	cluster	512	·4707493	± ·0000056	2·124273	11	± ·015	·35	·25	·42	14·0	15·4	4·19	14·30	10·11	± ·99
120	18 48 39·7	— 35 18·1	cluster	342	·291508		3·43044			·86	·50	·05	13·5	14·1	2·26	8·00	5·74	± 1·49
248	18 48 47·1	— 35 14·6	cluster	264	·5480499	± ·0000047	1·824651	11	± ·018	·52	·25	·61	14·3	15·5	·96	10·10	9·14	± 1·29
143	18 49 15·3	— 39 13·4	cluster	268	·5159328		1·938237			·19	·25	·27	13·1	14·3	— ·60	12·57	13·17	± 1·59
190	18 49 21·4	— 34 10·4	cluster	244	·5708249	± ·0000047	1·751851	13	± ·019	·82	·25	·90	14·3	15·5	4·81	15·00	10·19	± 1·48
191	18 50 3·9	— 34 3·7	cluster	264	·5012361	± ·0000032	1·995068	21	± ·021	·99	·25	·04	14·4	15·4	2·15	10·65	8·50	± 1·25
196	18 50 8·1	— 41 26·3	cluster	278	·4429593	± ·0000035	2·257544	30	± ·037	·17	·35	·30	14·1	15·1	1·13	9·25	8·12	± 1·78
122	18 50 33·1	— 32 34·5	cluster	231	·6734982		1·484785			·67	·35	·77	14·2	15·3	3·88	11·24	7·36	± 1·45
154	18 50 53·6	— 36 49·7	cluster	270	·5347108	± ·0000031	1·87017	11	± ·018	·85	·30	·95	14·6	15·5	3·08	10·50	7·42	± 1·60
123	18 50 56·5	— 36 48·1	cluster	230	·5263801	± ·0000040	1·89977	20	± ·031	·14	·30	·21	14·6	15·3	3·44	8·90	5·46	± 1·57
162	18 51 0·2	— 36 45·0	cluster	212	·4355162	± ·0000024	2·296126	27	± ·024	·69	·25	·75	13·8	15·3	—1·50	8·32	9·82	± 1·37
213	18 51 14·5	— 36 51·0	cluster	264	·5384149	± ·0000035	1·857304	15	± ·012	·46	·25	·54	14·4	15·2	1·65	8·38	6·73	± 1·52
214	18 51 19·3	— 36 43·9	cluster	299	·5342935	± ·0000063	1·871631	18	± ·038	·50	·25	·60	14·2	14·5	1·86	8·20	6·34	± 1·60
238	18 51 32·2	— 35 37 0	cluster	230	·5681240	± ·0000040	1·760179	19	± ·022	·60	·30	·67	14·6	15·7	3·01	10·55	7·54	± 1·25
215	18 52 9·0	— 40 30·6	cluster	313	·6096285	± ·0000060	1·640343	14	± ·026	·80	·35	·91	14·1	15·7	7·32	14·92	7·60	± 1·39
131	18 52 27·6	— 38 19·6	δ Cep	238	1·00938		·99071			·51	·25	·57	14·3	15·4	4·08	11·32	7·24	± 2·08
216	18 52 44.9	— 41 0·0	cluster	344	·5298251	± ·0000023	1·887415	18	± ·012	·25	·25	·31	13·3	14·9	—1·50	13·71	15·21	± 1·28
192	18 53 7·9	— 34 37·0	cluster	302	·4854962	± ·0000013	2·059748	24	± ·012	·93	·25	·99	14·0	15·1	2·46	14·13	11·47	± 1·20
172	18 53 12·2	— 34 13·3	cluster	251	·3997703	± ·0000017	2·501436	10	± ·014	·53	·40	·67	14·6	15·3	5·08	11·42	6·34	± 1·46
144	18 53 20·4	— 32 45·8	cluster	341	·5640862	± ·0000023	1·772779	11	± ·014	·16	·30	·23	13·2	14·5	— ·40	11·13	11·53	± ·96
124	18 53 26·9	— 37 34·0	irregular	290									13·1	15·3	—3·0	17·6	20·6	
187	18 53 43·9	— 35 05·7	cluster	343	·6202621	± ·0000050	1·612222	10	± ·018	·96	·40	·09	13·8	14·6	·95	7·81	6·86	± 1·51
250	18 53 54·3	— 34 13·6	cluster	271	·5623000	± ·0000071	1·778410	9	± ·032	·90	·25	·95	14·2	15·3	4·53	12·16	7·63	± 1·27
300	18 54 56·5	— 38 30·8	longper.	175									13·3	16·0	—1·0	17·8	18·8	
316	18 55 3·5	— 38 31·2	longper.	290									13·1	16·0	1·8	22·5	20·7	
202	18 55 58·2	— 39 53·1	cluster	286	·7630378		1·310551			·71	·25	·76	14·3	15·2	2·30	12·05	9·75	± 1·20
217	18 56 4·8	— 35 40·0	cluster	307	·7493464	± ·0000077	1·334496	13	± ·038	·49	·30	·57	13·9	14·6	3·85	12·84	8·99	± 1·46
125	18 56 50·4	— 36 4·7	cluster	339	·4659107	± ·0000017	2·146334	20	± ·015	·14	·30	·21	13·3	14·6	—1·50	14·59	16·09	± 1·92
218	18 57 0·2	— 35 41·0	cluster	291	·4580063	± ·0000013	2·183376	19	± ·011	·54	·20	·58	14·1	15·5	·87	10·30	9·43	± 1·18
193	18 57 3·0	— 32 11·5	cluster	525	·5552748	± ·0000063	1·800910	28	± ·022	·25	·30	·35	13·7	14·7	4·61	14·79	10·18	± 1·33
239	18 57 18·1	— 35 20·2	cluster	312	·6983888	± ·0000064	1·431867	15	± ·032	·17	·30	·26	13·9	15·1	3·33	14·27	10·96	± 1·30
203	18 57 44·6	— 35 22·9	cluster	243	·5603579	± ·0000016	1·784574	17	± ·012	·03	·20	·10	14·0	15·4	—1·00	9·36	10·36	± 1·17
219	18 57 44·8	— 35 33·5	cluster	277	·5484086	± ·0000017	1·823458	19	± ·012	·14	·25	·21	14·3	15·3	1·58	11·14	9·56	± 1·34
145	18 58 1·1	— 36 55·8	cluster	226	·5216048	± ·0000022	1·91716	15	± ·018	·81	·20	·86	14·3	15·2	3·44	11·97	8·53	± 1·32
312	18 58 58·9	— 41 44·2	longper.	355									13·5	14·5	—1·0	9·8	10·8	
164	18 59 11·1	— 41 33·0	cluster	253	·4613204	± ·0000024	2·167691	27	± ·024	·73	·30	·78	13·6	15·0	3·18	14·30	11·12	± 1·36
240	18 59 22·2	— 32 20·0	cluster	258	·4712857	± ·0000038	2·121855	15	± ·022	·04	·20	·09	14·1	15·5	3·64	13·80	10·16	± 1·19
146	19 0 29·2	— 35 42·0	cluster	315	·5738563	± ·0000014	1·742596	13	± ·007	·17	·25	·23	13·7	15·0	— ·81	12·20	13·01	± 1·44
255	19 0 51·6	— 34 35·5	cluster	235	·5463251	± ·0000041	1·830412	12	± ·023	·12	·30	·21	14·6	15·4	3·99	11·61	7·62	± 1·40
198	19 1 21·9	— 33 48·1	cluster	333	·5472321	± ·0000044	1·827378	10	± ·023	·83	·35	·95	13·9	14·7	5·99	14·52	8·53	± 1·14
126	19 1 33·4	— 32 9·8	cluster	508	·35696		2·8015			·19	·55	·39	14·0	14·8	2·12	8·04	5·92	± 1·54
133	19 1 49·8	— 39 30·0	Algol	367	·5769555		1·733236					·3633	13·4	14·5	4·41	16·11	11·70	± 1·11
173	19 2 09·9	— 39 22·5	cluster	344	·6592222	± ·0000047	1·516939	18	± ·029	·89	·35	·98	13·9	14·6	4·06	12·49	8·43	± 1·16
188	19 2 23·5	— 35 34·8	cluster	266	·6497726	± ·0000047	1·539000	27	± ·020	·27	·25	·34	13·9	15·1	2·61	12·60	9·99	± 1·24
272	19 2 58·5	— 35 5·7	?	302	·10761971	± ·00000042	9·291978	24	± ·013	·56	·45	·74	14·2	14·7	5·81	11·64	5·83	± 1·45
194	19 3 11·2	— 34 1·9	cluster	308	·5053102	± ·0000026	1·978983	33	± ·019	·27	·25	·33	13·9	14·8	—1·50	10·01	11·51	± 1·15
155	19 3 19·6	— 39 23·9	cluster	213	·4823327	± ·0000025	2·073258	31	± ·029	·69	·25	·77	13·9	14·9	—1·63	9·22	10·85	± 1·44
147	19 4 37·5	— 39 26·4	cluster	219	·5297219	± ·0000023	1·887783	17	± ·016	·58	·25	·67	14·6	15·6	3·21	12·87	9·66	± 1·37
																		m
302	19 5 53·5	— 36 27·1	Algol	396	8·01964		·124694						9·7	13·1				± ·035
174	19 6 20·0	— 34 33·9	cluster	265	·4500230	± ·0000019	2·222109	16	± ·017	·01	·30	·08	14·2	15·5	6·79	16·25	9·46	± 1·77
149	19 8 07·8	— 32 29·0	W UMa	320	·2456489	± ·0000011	4·07085	14	± ·016			·76	13·8	14·3	2·80	7·47	4·67	± 1·25
242	19 8 58·1	— 34 52·5	W UMa	250	·14650486	± ·00000066	6·825712	10	± ·010			·7263	14·4	15·2	·82	8·28	7·46	± 1·39
204	19 9 02·5	— 35 44·4	cluster	281	·5048809	± ·0000055	1·980665	14	± ·019	·62	·30	·72	14·1	15·2	4·07	13·47	9·40	± 1·52
273	19 10 00·3	— 36 11·5	cluster	206	·5288171	± ·0000059	1·891013	7	± ·019	·41	·25	·49	14·7	15·8	6·08	11·50	5·42	± 1·34
303	19 10 28·2	— 39 37·3	cluster	312	·6950989	± ·0000047	1·438644	34	± ·035	·30	·35	·41	13·9	14·6	·96	7·04	6·08	± ·86
157	19 11 52·8	— 41 38·4	Algol	371	1·5132599		·660825					·6439	13·2	14·3	4·77	13·34	8·57	± ·82
134	19 14 06·5	— 39 21·3	cluster	301	·4765999	± ·0000017	2·098196	13	± ·012	·45	·25	·51	13·6	14·9	7·39	18·61	11·22	± 1·56
135	19 15 06·8	— 32 12·8	cluster	197	·4589153	± ·0000033	2·17905	25	± ·024	·04	·30	·13	13·6	14·7	4·21	16·60	12·39	± 1·54

TABLE 4.

	s	m
	35	
a	·0	13·3
b	4·7	13·7
c	9·3	14·1
d	13·4	14·5
e	17·6	15·2
	42	
b	·0	12·6
c	4·2	13·2
d	9·6	13·7
e	13·7	14·1
f	19·0	14·5
	112	
a	·0	13·8
b	5·3	14·2
c	11·6	14·8
d	15·3	15·2
	115	
a	·0	12·8
b	7·1	13·5
c	12·8	14·0
d	17·9	14·7
	118	
a	·0	13·9
b	4·7	14·1
c	7·4	14·2
d	12·6	14·8
e	16·6	15·2
	119	
b	·0	12·9
c	4·8	13·5
d	9·9	14·0
e	14·5	14·7
f	18·4	15·4
	120	
a	·0	13·3
b	5·0	13·7
c	9·8	14·4
d	13·8	15·0
	121	
a	·0	13·7
b	5·5	14·0
c	10·0	14·2
d	13·5	14·7
e	17·3	15·2
	122	
b	·0	13·8
c	6·1	14·5
d	10·5	15·2
e	13·6	15·7
	123	
a	·0	14·1
b	5·5	14·8
c	9·9	15·4
	124	
a	·0	13·4
b	6·6	14·1
c	10·8	14·7
d	14·6	15·0
e	18·8	15·4

	s	m
	125	
a	·0	13·4
b	5·7	13·9
c	10·5	14·2
d	13·8	14·5
e	19·1	15·2
	126	
a	·0	13·8
b	5·2	14·4
c	10·4	15·0
	128	
a	·0	14·0
b	5·0	14·5
c	9·6	15·0
d	13·5	15·4
	130	
a	·0	13·4
b	4·5	13·8
c	9·7	14·2
d	13·1	14·8
e	16·0	15·2
	131	
a	·0	14·0
b	3·7	14·2
c	8·8	15·0
d	11·5	15·4
	133	
a	·0	13·2
b	4·3	13·4
c	10·9	14·0
d	15·3	14·4
e	20·5	15·0
	134	
a	·0	13·0
b	5·8	13·4
c	12·0	14·1
d	16·2	14·7
e	20·5	15·2
	135	
a	·0	13·2
b	6·6	13·8
c	11·1	14·1
d	15·6	14·5
e	20·1	15·2
	136	
A	·0	12·2
a	5·5	12·8
b	10·4	13·3
c	14·7	13·8
d	18·8	14·2
e	22·7	14·7
f	28·2	15·4
	138	
a	·0	14·1
b	4·9	14·5
c	8·4	14·8
d	12·4	15·4

	s	m
	139	
b	·0	13·8
c	6·5	14·4
d	10·2	14·4
e	15·3	15·0
f	19·4	15·7
	141	
a	·0	14·0
b	6·5	14·7
c	11·7	15·0
d	16·2	15·7
	143	
a	·0	13·2
b	6·0	13·5
c	10·8	14·1
d	15·2	14·5
	144	
a	·0	13·3
b	4·1	13·8
c	6·2	14·0
d	13·2	14·7
	145	
A	·0	14·1
a	4·8	14·4
b	9·2	14·8
c	13·3	15·4
	146	
a	·0	13·8
b	5·2	14·2
c	9·7	14·7
d	14·2	15·4
	147	
b	·0	14·0
c	5·9	14·8
d	10·7	15·2
e	11·9	15·4
	149	
a	·0	13·5
b	5·2	14·0
c	10·2	14·7
	150	
a	·0	13·7
b	4·3	14·1
c	10·0	14·8
d	15·4	15.4
	154	
b	·0	14·2
c	5·5	14·8
d	10·4	15·4
	155	
a	·0	14·0
b	2·6	14·2
c	8·2	14·8
d	11·4	15·2
	157	
a	·0	12·6
b	5·1	13·3
c	9·9	13·9
d	14·2	14·4

	s	m
	160	
a	·0	12·9
b	6·3	13·4
c	13·2	14·0
d	16·2	14·4
e	20·5	14·8
	161	
b	·0	14·0
c	4·4	14·5
d	9·0	15·2
e	12·2	15·4
	162	
a	·0	14·0
b	2·8	14·4
c	5·8	14·8
d	9·8	15·7
	164	
a	·0	13·2
b	4·7	13·8
c	8·7	14·4
d	13·0	14·8
e	17·0	15·4
	165	
c	·0	14·2
d	4·6	15·2
	167	
a	·0	13·7
b	6·7	14·1
c	11·4	14·8
d	15·0	15·4
	168	
A	·0	13·7
a	4·3	14·1
b	6·8	14·5
c	11·3	15·0
d	14·2	15·4
	169	
b	·0	14·1
c	4·5	14·7
d	8·6	15·2
e	11·2	15·7
	170	
a	·0	14·2
b	3·7	14·5
c	8·3	15·0
d	12·5	15·4
	172	
a	·0	14·0
b	4·9	14·5
c	9·0	15·0
d	13·1	15·7
	173	
a	·0	13·4
b	7·1	14·0
c	11·7	14·5
d	15·7	15·2

	s	m
	174	
A	·0	13·4
a	5·7	14·1
b	8·6	14·4
c	13·3	15·0
d	16·1	15·4
	176	
a	—5·0	13·7
b	·0	14·2
c	4·6	15·0
d	6·2	15·2
	177	
a	·0	13·4
b	5·2	14·0
c	10·3	14·7
	179	
a	·0	13·5
b	4·9	14·0
c	8·8	14·5
d	12·9	15·2
	180	
a	·0	13·9
b	6·0	14·7
c	10·5	15·2
	181	
a	·0	13·8
b	5·5	14·4
c	7·5	14·5
d	11·2	15·0
e	15·2	15·4
	182	
a	·0	13·7
b	4·4	14·1
c	9·7	14·8
d	14·4	15·4
	183	
a	·0	13·8
b	5·7	14·4
c	7·7	14·5
d	11·1	14·8
e	14·4	15·4
	184	
a	·0	13·8
b	6·3	14·5
c	8·7	14·8
d	12·8	15·4
	186	
b	·0	13·9
c	4·7	14·4
d	8·7	15·0
e	12·0	15·4
	187	
a	·0	13·8
b	5·0	14·1
c	9·5	14·8
	188	
b	·0	13·7
c	5·6	14·2
d	8·2	14·7
e	11·8	15·0

	s	m
	189	
a	·0	13·5
b	6·5	14·1
c	11·2	14·5
d	14·5	14·8
	190	
a	·0	13·9
b	5·4	14·4
c	9·6	14·7
d	11·8	15·0
e	14·4	15·4
	191	
a	·0	14·2
b	4·7	14·7
c	11·1	15·4
	192	
a	·0	13·9
b	7·3	14·4
c	13·0	15·0
d	17·1	15·7
	193	
a	·0	13·2
b	6·8	13·9
c	10·9	14·2
d	14·0	14·7
e	19·5	15·2
	194	
a	·0	14·0
b	3·2	14·2
c	10·0	14·8
d	13·1	15·4
	195	
a	·0	14·1
b	3·4	14·4
c	7·6	15·0
d	11·7	15·7
	196	
a	·0	13·9
b	3·0	14·4
c	7·6	14·8
d	10·0	15·4
	198	
A	·0	13·4
a	7·0	14·0
b	11·2	14.4
c	13·1	14·5
d	17·9	15·2
	199	
a	·0	13·7
b	5·4	14·2
c	9·7	14·7
d	14·0	15·2
	200	
a	·0	13·5
b	3·5	13·9
c	6·7	14·2
d	10·0	14·7
e	14·1	15·0

	s	m
	201	
a	·0	14·1
b	4·2	14·5
c	8·5	15·0
d	12·0	15·7
	202	
a	·0	14·1
b	7·5	14·8
c	10·5	15·0
d	14·5	15·4
	203	
a	·0	14·1
b	3·1	14·5
c	7·7	15·2
d	11·3	15·7
	204	
a	·0	13·8
b	5·9	14·2
c	10·2	14·7
d	13·6	15·2
e	16·7	15·7
	205	
a	·0	13·5
b	6·4	14·1
c	11·1	14·7
d	14·5	15·2
	206	
a	·0	13·7
b	5·0	14·1
c	8·2	14·4
d	13·3	14·8
	207	
a	·0	13·8
b	4·0	14·0
c	8·1	14·5
d	11·7	14·8
e	15·4	15·4
	208	
a	·0	14·2
b	5·4	14·7
c	10·5	15·4
	209	
b	·0	13·9
c	5·9	14·4
d	9·9	15·0
e	14·9	15·7
	210	
a	·0	13·4
b	4·3	14·0
c	10·0	14·5
d	13.6	15·0
e	17·4	15·4
	211	
b	·0	14·0
c	4·4	14·4
d	9·4	14·8
e	13·4	15·4

	s	m
	212	
a	·0	14·1
b	4·2	14·4
c	9·6	15·0
d	12·2	15·4
	213	
a	·0	14·2
b	5·0	14·8
c	9·5	15·4
	214	
a	·0	14·1
b	3·7	14·2
c	8·3	14·5
d	13·1	15·2
	215	
a	·0	13·4
b	7·6	14·1
c	11·7	14·2
d	15·7	14·8
e	19·4	15·7
	216	
a	·0	13·5
b	4·0	14·0
c	9·6	14·5
d	16·6	15·2
	217	
A	·0	13·5
a	7·1	14·2
b	10·7	14·4
c	15·4	15·0
	218	
b	·0	14·0
c	4·1	14·5
d	8·9	15·2
	219	
a	·0	14·1
b	4·2	14·5
c	8·6	15·0
d	11·8	15·4
	220	
a	·0	13·9
b	3·9	14·4
c	8·4	15·0
	221	
a	·0	14·0
b	3·0	14·2
c	6·5	14·7
d	10·3	15·0
e	14·0	15·4
	222	
a	·0	13·7
b	7·9	14·4
c	12·2	15·0
d	15·5	15·2

TABLE 4 (*continued*).

	s	m
b	8·7	13·3
c	14·4	13·7
d	19·7	14·0
e	27·2	14·8
223		
a	·0	14·0
b	4·4	14·4
c	8·0	14·8
d	12·4	15·4
224		
a	·0	13·2
b	5·0	13·7
c	13·8	14·2
d	18·6	14·8
226		
A	·0	13·0
a	5·1	13·7
b	10·4	14·1
c	14·6	14·7
231		
a	·0	13·9
b	5·2	14·7
c	8·4	15·2
232		
a	·0	12·5

	s	m
235		
b	·0	14·0
c	5·4	14·7
d	7·8	14·8
e	11·8	15·4
236		
a	·0	14·0
b	4·8	14·5
c	9·4	15·2
237		
b	·0	13·5
c	4·4	14·0
d	9·6	14·7
e	13·3	15·2
238		
a	·0	14·2
b	4·8	14·8
c	7·7	15·0
d	10·7	15·7

	s	m
239		
a	·0	13·7
b	4·5	14·0
c	10·3	14·7
d	14·9	15·2
240		
b	·0	13·7
c	5·4	14·2
d	7·9	14·7
e	12·2	15·2
242		
b	·0	14·2
c	4·8	15·0
d	8·0	15·2
245		
b	·0	13·7
c	4·5	14·0
d	8·6	14·5
e	11·8	14·8
246		
a	·0	13·3

	s	m
b	9·2	14·0
c	13·4	14·2
d	17·4	14·7
248		
a	·0	14·1
b	2·6	14·5
c	6·0	14·7
d	10·8	15·7
250		
a	·0	13·8
b	4·0	14·1
c	8·7	14·8
d	13·1	15·4
253		
a	·0	13·7
b	5·8	14·1
c	9·7	14·4
d	13·3	14·8
e	16·9	15·2
255		
b	·0	14·0
c	4·7	14·7

	s	m
d	8·6	15·0
e	11·8	15·4
268		
b	·0	13·8
c	5·6	14·4
d	9·8	15·0
272		
a	·0	13·7
b	5·0	14·1
c	8·6	14·5
d	13·2	14·8
273		
a	·0	14·1
b	4·6	14·5
c	7·8	15·0
d	11·4	15·7
274		
A	·0	12·2
B	5·2	12·9
a	9·9	13·4
b	14·6	13·9
c	18·4	14·2

	s	m
d	22·3	14·7
e	25·5	15·2
277		
a	·0	13·3
b	6·0	14·0
c	11·0	14·7
d	15·9	15·4
280		
a	·0	13·7
b	4·0	13·9
c	7·4	14·4
d	11·2	15·0
283		
a	·0	14·4
b	3·3	14·8
c	6·3	15·0
d	9·4	15·7
288		
a	·0	14·0
b	3·8	14·4
c	6·2	14·7
d	10·4	15·4

	s	m
300		
b	·0	13·4
c	6·3	14·0
d	12·1	14·8
e	15·8	15·4
302		
	m	
a	·0	9·3
b	·47	9·9
c	1·13	10·5
d	1·58	11·0
e	2·18	11·3
f	2·85	12·1
g	3·22	12·3
h	4·18	13·3
303		
a	·0	13·8
b	4·2	14·2
c	7·9	14·7
309		
a	·0	14·1

	s	m
b	5·5	14·7
c	8·4	14·8
d	12·2	15·2
310		
b	·0	13·4
c	2·1	13·8
d	6·9	14·2
e	11·1	14·7
f	15·5	15·4
312		
a	·0	13·7
b	5·6	14·1
c	11·2	14·7
316		
a	·0	12·9
b	4·5	13·4
c	10·8	14·0
d	16·6	14·8
e	20·5	15·4

TABLE 5.

d	t	d
35		
2423883·575	0 +	·005
4019·228	259 +	6
20·256	261 —	14
5381·485	2860 —	24
5473·209	3035 +	43
74·231	3037 +	18
·254	3037 +	41
99·340	3085 —	13
5500·378	3087 —	23
·400	3087 —	1
08·258	3102 +	1
5745·504	3555 —	14
50·440	3658 —	25
·463	3658 —	2
5808·361	3675 —	8
6566·252	5122 +	10
42		
2424021·337	0 +	·011
30·222	19 —	3
5441·379	3032 +	6
42·317	3034 +	7
73·231	3100 +	10
79·303	3113 —	7
80·235	3115 —	12
5500·378	3158 —	8
02·257	3162 —	2
61·258	3288 —	14
5794·497	3786 —	15
·519	3786 +	7
6090·506	4418 —	5
·527	4418 +	16
6242·244	4742 —	13
·260	4742 +	3
·269	4742 +	12
6563·548	5428 +	1
66·363	5434 +	5

d	t	d
112		
2423990·273	0 —	·005
4017·169	41 +	24
28·321	58 —	36
30·289	61 +	1
5472·833	2260 —	20
74·801	2263 —	33
78·737	2269 +	7
97·761	2298 —	20
·761	2298 +	4
·761	2298 +	25
·761	2298 +	47
·761	2298 +	69
5499·729	2301 —	7
·729	2301 +	16
5520·721	2333 —	18
·721	2333 +	23
22·689	2336 —	7
·689	2336 +	15
5714·897	2629 —	32
43·761	2673 —	12
·761	2673 +	9
6091·441	3203 —	38
6153·105	3297 —	25
6239·041	3428 —	23
6559·825	3917 +	5
·825	3917 +	26
·825	3917 +	48
6563·761	3923 —	36
·761	3923 —	15
·761	3923 +	7
115		
2423998·264	0 —	·019
4018·345	34 —	16
21·337	39 +	23
24·252	44 —	14
·277	44 +	11

d	t	d
2425498·255	2540 +	3
·278	2540 +	26
5501·234	2545 +	29
08·280	2557 —	11
·303	2557 +	12
24·217	2584 —	19
·239	2584 +	3
31·304	2596 —	18
·326	2596 +	4
6093·506	3548 —	10
6155·550	3653 +	28
6562·378	4342 —	26
·400	4342 —	4
66·535	4349 —	2
119		
2423883·546	0 +	·015
87·285	239 +	2
4017·225	308 —	11
30·263	338 +	4
33·293	345 —	5
56·302	398 —	4
4261·636	871 —	4
5391·629	3474 +	4
5473·231	3662 —	7
·253	3662 +	16
75·420	3667 +	12
79·303	3676 —	12
·325	3676 +	10
99·275	3722 —	9
·296	3722 +	12
5508·385	3743 —	16
32·288	3798 +	11
5791·440	4395	0
97·510	4409 —	7
5808·361	4434 —	9
6090·527	5084 —	14
6563·290	6173 +	5

d	t	d
2426565·449	6178 —	7
66·320	6180 —	4
66·342	6180 +	18
123		
2423879·512	0 —	·037
3994·289	218 —	11
·338	218 +	38
4024·325	275 +	21
25·347	277 —	9
33·269	292 +	17
4296·421	792 —	21
97·446	794 —	49
5441·379	2967 +	60
45·517	2975 —	13
80·258	3041 —	13
·279	3041 +	8
·301	3041 +	30
·323	3041 +	52
5531·304	3138 —	26
5794·519	3638 —	1
6093·506	4206 +	2
6155·638	4324 +	21
6562·464	5097 —	45
·486	5097 —	23
125		
2423994·338	0 —	·015
96·238	4 +	22
4016·247	47 —	4
22·301	60 —	6
·325	60 +	18
27·410	71 —	22
29·297	75 +	1
30·222	77 —	6
5391·605	2999 —	14
5499·251	3230 +	7
·275	3230 +	30

d	t	d
2425532·310	3301 —	14
61·234	3363 +	23
5707·505	3677 —	1
19·608	3703 —	12
·630	3703 +	10
64·352	3799 +	4
6155·244	4638 —	3
6552·443	5512 —	10
63·376	5514 —	8
128		
2423883·561	0 —	·006
5480·312	2712 +	5
5500·334	2746 +	9
6562·464	4550 +	1
6564·220	4553 —	9
130		
2423989·324	0 +	·003
4012·346	50 +	4
18·321	63 —	6
24·302	76 —	10
25·226	78 —	7
·250	78 +	17
4296·421	667 +	6
5473·209	3223 —	16
·231	3223 +	6
·253	3223 +	28
5500·378	3282 —	11
·400	3282 +	10
02·217	3286 —	14
06·367	3295 —	8
08·212	3299 —	4
25·248	3336 —	4
6155·550	4705 —	4
6562·550	5589 —	7
6563·462	5591 —	16
·484	5591 +	6

TABLE 5 (*continued*)

d	t	d
2426563·505	5591 +	27
66·229	5597 —	11
·252	5597 +	11

134

d	t	d
2423990·345	0 —	·005
91·293	2 —	10
4033·244	90	0
5415·404	2990 +	20
74·479	3114 —	3
5551·233	3275 +	19
61·234	3296 +	11
5707·527	3603 —	12
16·592	3622 —	3
6562·550	5397 —	10
63·505	5399 —	8
65·428	5403 +	9
66·363	5405 —	9

135

d	t	d
2424012·346	0 —	·021
4296·421	619 —	15
·445	619 +	9
5442·317	3116 —	31
65·342	3166 +	48
74·457	3186 —	15
·479	3186 +	7
75·420	3188 +	30
82·265	3203 —	9
99·251	3240 —	2
·275	3240 +	21
·296	3240 +	43
5509·329	3262 —	21
22·236	3290 +	37
27·223	3301 —	24
·248	3301 +	1
32·288	3312 —	7
·310	3312 +	15
6093·506	4535 —	43
6156·400	4672 —	20
6562·550	5557 —	10
63·462	5559 —	16
·484	5559 +	6
66·229	5565 —	2
·252	5565 +	20

136

d	t	d
2423880·546	0 —	·029
4019·253	123 —	22
20·395	124 —	8
28·279	131 —	17
·328	131 +	32
4294·433	367 +	12
·454	367 +	34
5381·485	1331 +	14
·508	1331 +	37
91·605	1340 —	15
·629	1340 +	9
5442·317	1385 —	47
5795·328	1698 +	11
6563·211	2379 —	33
·232	2379 —	12
·250	2379 +	7
·269	2379 +	25

138

d	t	d
2423883·546	0 —	·004
4012·346	220 —	10
32·290	254 +	28

d	t	d
2425501·234	2763 +	1
08·236	2775 —	23
25·226	2804 —	12
6156·400	3882 +	14
6241·268	4027 —	12
6563·312	4577 +	18

139

d	t	d
2423881·520	0 +	·013
3989·273	199 —	19
4028·279	271 —	11
·304	271 +	14
5415·404	2832 —	9
·427	2832 +	15
5442·511	2882 +	15
79·325	2950	0
98·278	2985 —	4
99·363	2987 —	3
5506·393	3000 —	14
31·304	3046 —	18
·326	3046 +	4
5716·571	3388 +	10
99·440	3541 +	9
6564·209	4953 —	8
66·363	4957 —	20
·384	4957	0
·406	4957 +	23

141

d	t	d
2424027·410	0 +	·023
4264·552	461 —	16
5361·449	2593 —	20
83·605	2636 +	13
5479·280	2822 —	8
80·301	2824 —	16
·323	2824 +	6
5738·603	3326 +	10
6090·506	4010	0
6155·320	4136 —	13
·341	4136 +	8
6562·292	4927 —	5
·314	4927 +	17
63·333	4929 +	7
66·406	4935 —	7

d	t	d
2424296·445	523 —	4
5499·340	2861 —	15
5500·378	2863 —	6
32·288	2925 +	5
·310	2925 +	27
6563·312	4929 —	34
·355	4929 +	9
65·428	4933 +	24
66·428	4935 —	5

144

d	t	d
2423997·272	0 +	·023
4019·228	39 —	21
·253	39 +	4
24·325	48 —	1
32·220	62 —	3
5451·477	2578 +	13
80·235	2629 +	3
98·278	2661 —	5
5502·217	2668 —	15
6563·269	4549 —	9
·290	4549 +	12

145

d	t	d
2423877·528	0 —	·019
·555	0 +	9
3991·268	218 +	12
92·289	218 +	32
4030·360	293 —	17
4297·423	805 —	15
·446	805 +	7
5501·285	3113 —	17
24·239	3157 —	14
6155·409	4367 +	14
6562·249	5147 +	3
63·269	5149 —	21
66·406	5155 —	13
·428	5155 +	9
·449	5155 +	29

146

d	t	d
2423987·285	0 —	·004
4018·271	54 —	6
22·301	61 +	7
30·335	75 +	7
5437·423	2527 —	1
41·431	2534 —	10
75·306	2593 +	7
79·303	2600 —	13
·325	2600 +	9
98·255	2633 +	2
5525·226	2680 +	2
5790·345	3142 —	1
6563·333	4489 +	3

147

d	t	d
2423879·512	0 +	·012
80·546	2 —	13
4296·421	787 +	30
97·446	789 —	5
5410·369	2890 —	27
37·423	2941 +	11
74·479	3011 —	14
80·301	3022 —	19
·323	3022 +	4
99·385	3058 —	5
5507·329	3073 —	6
5706·521	3449 +	10
6561·481	5063 —	1
6562·528	5065 —	14
·550	5065 +	9
6566·252	5072 +	2
·276	5072 +	27

149

d	t	d
2424019·253	0 +	·006
28·304	37 —	32
31·285	49 +	2
32·290	53 +	24
5442·533	5794 —	4
99·296	6025 +	15
5719·630	6922 +	1
40·508	7007 —	1
99·462	7247 —	3
6093·484	8444 —	22
6155·409	8696 —	1
6563·211	10356 +	24
·419	10357 —	14
66·384	10369 +	4

150

d	t	d
2423987·311	0 —	·010
89·273	4 —	9
90·273	6 +	10
4012·334	51 +	2
17·254	61 +	18
5361·449	2802 —	8
85·486	2851 —	1
5441·379	2965 —	16
73·286	3030 +	·015
74·254	3032 +	2
98·266	3081 —	16
99·263	3083	0
5525·248	3136 —	7
5739·560	3573 —	6
94·497	3685 +	5
6155·431	4421 —	5
6242·252	4598 +	13
6563·462	5253 +	3
66·406	5259 +	5

154

d	t	d
2423965·374	0 —	·024
86·260	39 +	9
87·311	41 —	10
4018·345	99 +	11
32·244	125 +	7
4261·611	554 —	16
5393·614	2671 +	4
·638	2671 +	27
5445·495	2768 +	18
6155·571	4096 —	2
6566·207	4864 —	24

155

d	t	d
2423988·344	0 +	·027
·368	0 +	55
89·273	2 —	9
·324	2 +	42
90·273	4 +	27
4016·295	58 +	3
17·254	60 —	3
29·273	85 —	42
·297	85 —	18
5442·533	3015 —	17
75·306	3083 —	43
·329	3083 —	19
5500·400	3135 —	30
07·216	3149 +	33
5797·488	3751 —	59
·510	3751 —	37
99·440	3755 —	36
·462	3755 —	14
6155·431	4493 —	7
56·400	4495 —	2
6242·244	4673 —	14
·260	4673 +	3
6562·550	5337 +	23
63·484	5339 —	7
·505	5339 +	14
·527	5339 +	35
65·428	5343 +	7
·449	5343 +	29
66·384	5345 —	1
·406	5345 +	21
·428	5345 +	42

160

d	t	d
2423878·556	0 +	·005
4026·295	90 +	3

d	t	d
2425500·400	988 —	21
6155·409	1387 +	2
6562·528	1635 +	11

161

d	t	d
2423998·239	0 —	·008
·264	0 +	18
4017·225	29 —	16
30·335	49 —	6
5442·511	2205 +	2
73·275	2252 —	18
5507·350	2304 —	3
09·329	2307 +	11
32·288	2342 +	45
51·233	2371 —	5
6562·528	3915 —	20
·550	3915 +	1
63·211	3916 +	8
66·470	3921 —	8

162

d	t	d
2423879·512	0 +	·025
3965·332	197 +	48
3988·344	250 —	22
4012·321	305 +	2
·346	305 +	27
25·347	335 —	38
29·273	344 —	31
33·221	353 —	3
4298·446	962 —	7
5385·486	3458 —	16
91·605	3472 +	6
·629	3472 +	30
5410·344	3515 +	18
42·533	3589 —	21
·577	3589 +	22
5498·278	3717 —	23
5502·217	3726 —	3
08·280	3740 —	37
·303	3740 —	15
22·236	3772 —	18
·277	3772 +	23
5791·418	4390 +	15
97·488	4404 —	12
·510	4404 +	10
6156·400	5228 +	34
6562·249	6160 —	18
·271	6160 +	5

164

d	t	d
2423880·546	0 +	·002
81·552	2 +	85
3991·268	240 +	7
4020·305	303 —	19
26·295	316 —	26
33·221	331 —	20
56·302	381 —	5
5438·417	3377 —	6
42·555	3386 —	20
·577	3386 +	2
·599	3386 +	24
75·306	3457 —	23
·329	3457 +	1
82·243	3472 —	6
·265	3472 +	17
99·296	3509 —	21
·318	3509	0
5524·217	3563 —	12
53·264	3626 —	28

TABLE 5 (*continued*).

d	t	d
2425716·592	3980 —	7
6093·484	4797 —	14
6155·320	4931 +	5
·341	4931 +	26
6562·228	5813 +	28
65·428	5820 —	1
·449	5820 +	20
66·342	5822 —	10

165

2423994·338	0 +	·002
4031·333	80 +	3
4261·611	578 —	10
94·444	649 —	10
5393·638	3026 —	16
5415·404	3073 +	16
51·455	3151 —	3
65·342	3181 +	11
5522·236	3304 +	25
5739·546	3774 —	8
40·486	3776 +	8
6562·217	5553 —	2
65·449	5560 —	8
66·374	5562 —	8

167

2423986·260	0 +	·036
5441·507	2376 +	5
65·342	2415 —	47
5527·223	2516 —	27
·248	2516 —	2
5808·361	2975 —	22
6562·357	4206 —	2
·378	4206 +	18
·400	4206 +	41

168

2423997·272	0 —	·006
98·264	2 +	23
4020·395	48 +	1
21·337	50 —	20
22·325	52 +	5
24·277	56 +	31
4264·529	555 —	25
·552	555 —	2
92·464	613 —	22
93·436	615 —	13
·460	615 +	12
94·433	617 +	21
5441·507	2999 —	24
42·511	3001 +	16
73·297	3065 —	19
·319	3065 +	4
74·276	3067 —	3
·298	3067 +	20
99·296	3119 —	25
·318	3119 —	3
5500·311	3121 +	27
01·234	3123 —	13
·257	3123 +	10
02·217	3125 +	7
27·248	3177 —	4
53·242	3231 —	16
·264	3231 +	7
5794·519	3732 —	9
6155·244	4481 +	13
6566·492	5335 —	6
·513	5335 +	14

169

d	t	d
2423986·260	0 —	·025
5381·485	2869 +	45
91·629	2890 —	23
93·638	2894 +	40
5437·423	2984 +	60
51·455	3013 —	11
·477	3013 +	11
74·298	3060 —	23
75·306	3062 +	12
·329	3062 +	35
5506·367	3126 —	49
·393	3126 —	23
08·385	3130 +	24
09·329	3132 —	5
5790·367	3710 —	40
5808·361	3747 —	39
6155·638	4461 +	30
6566·492	5306 —	28
·513	5306 —	7
·535	5306 +	15

170

2423883·546	0 —	·036
3988·344	166 —	10
4012·321	204 —	17
31·285	234 +	12
33·221	237 +	55
4294·454	651 —	12
5410·344	2419 —	11
42·555	2470 +	11
5501·234	2563 —	7
·257	2563 +	15
5719·608	2909 —	14
·630	2909 +	7
45·504	2950 +	4
·526	2950 +	26
64·427	2980 —	8
6562·206	4244 —	13
·228	4244 +	8
·249	4244 +	30
6563·462	4246 —	20
·484	4246 +	3
67·244	4252 —	25

172

2424012·346	0 —	·016
·371	0 +	9
30·360	45 +	8
5508·303	3742	0
5716·592	4263 +	9
94·519	4458 —	19
6155·550	5361 +	19
6562·486	6379 —	11
·507	6379 +	10
63·290	6381 —	7

173

2423877·555	0 +	·015
79·512	3 —	6
81·520	6 +	24
3990·273	171 +	6
4297·446	637 —	19
5437·253	2366 —	7
42·544	2374 +	10
79·442	2430 —	8
5501·234	2463 +	29
5707·527	2776 —	14
40·497	2826 —	5
2425794·519	2908 —	39
5808·361	2929 —	41
6090·527	3357 —	22
6562·528	4073 —	24
63·241	4074 +	29
66·502	4079 —	6
67·244	4080 +	77

174

2423991·268	0 —	·026
·293	0 —	1
96·238	11 —	7
·264	11 +	20
4018·295	60 —	1
32·244	91 —	2
5437·231	3213 +	13
·253	3213 +	35
82·243	3213 +	23
99·318	3351 —	3
5508·303	3371 —	19
27·223	3413	0
6155·431	4809 —	24
6565·428	5720 +	2
66·320	5722 —	6
67·223	5724 —	3

176

2423987·311	0 +	·010
90·345	6 +	10
4021·219	67 +	35
5381·508	2757 —	83
5410·369	2814 —	48
37·231	2867 +	10
·253	2867 +	32
82·243	2956 +	13
99·385	2990 —	39
5531·304	3053 +	18
38·603	3463 —	31
6561·459	5090 +	7
62·486	5092 +	22
63·484	5094 +	9
·505	5094 +	30
66·513	5100 +	4

179

2423881·520	0 —	·004
3987·311	195 +	1
4031·285	276 +	34
5420·562	2837 —	3
74·254	2936 —	17
5507·329	2997 —	34
·350	2997 —	13
6090·527	4072 —	12
6562·507	4942 +	3
·550	4942 +	46

180

d	t	d
2423989·273	0 —	·004
4012·346	52 —	8
17·225	63 —	10
21·219	72 —	10
33·244	99 +	33
5391·629	3160 +	15
5442·632	3275 —	17
46·217	3283 +	18
73·253	3344 —	16
·275	3344 +	6
·319	3344 +	50
5500·334	3405 —	6
2425508·303	3423 —	25
32·288	3477 —	4
5791·440	4061 —	18
99·440	4079 —	6
6155·341	4881 —	14
6562·292	5798 —	7
·314	5798 +	15
65·428	5805 +	22
66·276	5807 —	17
·299	5807 +	6

181

2423877·54	0 +	·00
80·53	5 —	6
3990·31	185 +	5
4029·26	249 +	1
32·27	254 —	3
4292·45	681	0
5385·44	2475 —	3
5437·25	2560 —	1
65·35	2606 +	7
79·30	2629	0
5501·26	2665 +	3
07·35	2675 +	3
32·30	2716	0
5706·53	3002 —	2
6155·57	3739 —	1
6562·51	4407 —	6
63·22	4408 +	4
66·21	4413 —	1

183

2423989·324	0 —	·009
4029·273	87 +	6
5391·629	3055	0
5442·577	3166 —	2
74·254	3235 +	2
79·325	3246 +	24
5506·367	3305 —	16
·393	3305 +	10
5523·362	3342 —	4
5706·521	3741 +	7
40·486	3815 +	5
45·526	3826 —	4
91·418	3926 —	14
·440	3926 +	8
98·305	3941 —	12
6155·431	4719 —	1
6241·268	4906	0
6566·252	5614	0

186

2423879·512	0 +	·027
88·344	15 —	16
·368	15 +	8
94·289	25 +	12
4030·335	255 —	27
·360	255 —	2
4292·464	698 —	10
5501·257	2741 —	10
08·385	2753 +	18
5795·328	3238 —	2
98·305	3243 +	17
99·462	3245 —	10
5808·339	3260 —	8
5904·223	3422 +	25
6155·638	3847 —	22
6563·333	4536 +	8
66·276	4541 —	7

187

d	t	d
2423988·344	0 +	·012
98·239	16 —	17
5499·296	2436 +	6
·318	2436 +	28
5507·329	2449 —	25
·350	2449 —	4
·372	2449 +	18
22·236	2473 —	4
6093·484	3394 —	18
·506	3394 +	4

188

2424024·302	0 +	·032
5415·404	2141 —	29
·427	2141 —	6
73·231	2230 —	32
·253	2230 —	10
·297	2230 +	34
5506·393	2281 —	8
25·226	2310 —	18
51·233	2350 —	2
·255	2350 +	20
5706·521	2589 —	10
45·504	2649 —	13
·526	2649 +	9
64·352	2678 —	9
90·345	2718 —	7
·367	2718 +	15
97·488	2729 —	11
99·440	2732 —	9
·462	2732 +	13
6090·527	3180 —	20
6155·550	3280 +	26
6241·268	3412 —	26
6562·271	3906 —	11
·292	3906 +	10
·314	3906 +	32
64·231	3909	0
66·207	3912 +	27

190

2423881·552	0 —	·001
5420·495	2696 —	2
75·306	2792 +	10
·329	2792 +	33
99·251	2834 —	20
·296	2834 +	25
5500·400	2836 —	12
5719·608	3220 —	1
50·367	3344 —	25
6093·484	3875 —	16
6156·274	3985 —	16
6563·290	4698 +	2
·312	4698 +	24

191

2423988·368	0 +	·005
90·345	4 —	23
4264·552	551 +	8
5410·369	2837 —	1
15·404	2847 +	22
·427	2847 +	45
37·423	2891 —	14
38·417	2893 —	22
41·431	2899 —	16
51·455	2919 —	16
·477	2919 +	6
5551·255	3118 +	38

TABLE 5 (*continued*).

d	t	d
2425553·242	3122 +	20
61·258	3138 +	16
5719·608	3454 —	25
·630	3454 —	3
98·305	3611 —	22
6090·527	4194 —	20
6562·206	5135 —	5
66·229	5143 +	9
67·223	5145	0

192

d	t	d
2423988·344	0 —	·005
89·324	2 +	4
91·268	6 +	6
4020·395	66 +	3
22·325	70 —	9
25·250	76 +	3
5410·369	2929 +	2
41·431	2993 —	8
74·457	3061 +	4
·479	3061 +	26
75·420	3063 —	4
79·303	3071 —	25
80·279	3073	0
5706·521	3539 +	1
19·630	3566 +	1
40·508	3609 +	3
6090·527	4330 —	21
93·484	4336 +	23
6561·481	5300 +	2
62·443	5302 —	7
·464	5302 +	14
63·419	5304 —	2
66·320	5310 —	14
·342	5310 +	8

193

d	t	d
2425437·423	0 —	·026
80·235	77 +	30
5501·285	115 —	21
51·244	205 —	37
5719·529	508	0
39·554	544 +	35
64·494	589 —	12
94·508	643 +	17
99·486	652 —	2
5803·362	659 —	13
08·350	668 —	23
32·258	711 +	8
57·239	756 +	2
62·265	765 +	30
63·349	767 +	4
93·341	821 +	11
6090·506	1176 +	54
6155·420	1293	0
61·516	1304 —	12
6219·260	1408 —	16
39·278	1444 +	12
44·249	1453 —	15
6562·443	2026 +	7
63·538	2028 —	9
66·310	2033 —	13
70·221	2040 +	11
71·330	2042 +	10
73·509	2046 —	32

194

d	t	d
2423965·374	0 +	·026
4012·321	93 —	21
·346	93 +	4
2424012·371	93 +	29
20·395	109 —	32
5360·498	2761 —	11
5438·347	2915 +	20
41·379	2921 +	20
51·455	2941 —	10
·477	2941 +	12
73·209	2984 +	15
76·255	2990 +	29
79·280	2996 +	23
80·257	2998 —	11
·279	2998 +	11
82.265	3002 —	24
5524·217	3085 —	13
·239	3085 +	9
25·226	3087 —	15
·248	3087 +	7
26·220	3089 —	31
·242	3089 —	9
27·248	3091 —	14
31·304	3099	0
·326	3099 +	22
32·288	3101 —	27
·310	3101 —	5
5740·486	3513 —	17
·508	3513 +	5
5904·223	3837	0
6155·341	4334 —	21
6241·268	4504 +	3
6566·207	5147 +	27

195

d	t	d
2423880·546	0 —	·010
3988·344	197 +	27
4028·255	270 +	7
4292·440	753 —	14
98·446	764 —	25
5385·416	2751 +	37
5507·350	2974 —	12
·372	2974 +	10
5799·440	3508 —	25
6090·506	4040 +	31
6155·550	4159 —	19
6561·459	4901 +	9
62·528	4903 —	16

196

d	t	d
2423883·575	0 +	·017
3990·345	241 +	34
4020·395	309 —	38
21·299	311 —	19
24·350	318 —	69
29·249	329 —	43
·273	329 —	19
33·244	338 —	34
·269	338 —	9
56·302	390 —	10
4264·529	860 +	26
92·440	923 +	30
·464	923 +	54
96·445	932 +	49
5393·614	3409 +	8
5438·347	3510 +	2
·369	3510 +	24
41·507	3517 +	61
45·495	3526 +	62
5500·311	3650 —	49
·334	3650 —	26
01·234	3652 —	11
08·303	3668 —	30
2425532·288	3722 +	35
5719·608	4145 —	16
·630	4145 +	6
91·418	4307 +	34
6093·506	4989 +	24
6563·419	6050 —	43
66·513	6057 —	50

198

d	t	d
2424018·271	0 —	·020
4297·423	510 +	43
5438·347	2595 —	11
51·477	2619 —	15
74·457	2661 —	19
·479	2661 +	3
6562·357	4649 —	16
63·462	4651 —	6
·483	4651 +	15
66·229	4656 +	25

199

d	t	d
2424016·247	0 —	·018
·271	0 +	6
28·255	27 +	22
5385·463	3089 —	1
5442·632	3218 —	11
73·231	3287 +	3
5507·350	3364 —	8
51·233	3463 —	7
5740·508	3890 +	1
99·462	4023 +	2
6566·276	5753 —	6
·299	5753 +	17

200

d	t	d
2423883·575	0 —	·008
4018·321	282 —	25
·345	282 —	1
4297·423	866 —	4
5474·457	3329 +	14
·479	3329 +	36
75·420	3331 +	20
99·296	3381 +	2
5509·329	3402	0
22·236	3429 +	4
31·304	3448 —	8
32·288	3450 +	20
5797·488	4005 —	3
6155·409	4754 —	13
56·400	4756 +	22
6563·505	5608 —	26
65·428	5612 —	15
66·384	5614 —	15

201

d	t	d
2423883·575	0 —	·030
4012·321	245 +	2
·346	245 +	27
32·290	283 +	7
4294·433	782 —	6
5361·449	2813 —	3
5445·517	2973 +	7
5502·217	3081 —	32
5716·571	3489 —	27
·592	3489 —	6
45·504	3544 +	11
·526	3544 +	33
64·427	3580 +	21
97·510	3643 +	6
2426156·324	4326 —	3
6562·421	5099 —	12
63·462	5101 —	21
·484	5101 +	1
·505	5101 +	22

203

d	t	d
2423880·546	0 +	·015
3994·289	203 +	5
4031·261	269 —	6
4297·423	744 —	14
·446	744 +	9
5475·306	2846 —	4
98·278	2887 —	6
99·385	2889 —	20
5508·385	2905 +	14
5719·630	3282 +	4
97·510	3421 —	6
6155·571	4060 —	13
6562·400	4786 —	4
·421	4786 +	17
63·527	4788 +	2
66·320	4793 —	7
·342	4793 +	15

204

d	t	d
2424298·423	0 +	·008
5385·416	2153 —	8
·440	2153 +	16
5445·495	2272 —	9
·517	2272 +	13
74·276	2329 —	7
79·303	2339 —	28
80·323	2341 —	18
5706.521	2789 —	7
·543	2789 +	15
07·527	2791 —	11
99.440	2973 +	14
6155·409	3678 +	42
6566·320	4492 —	20

205

d	t	d
2423878·530	0 —	·002
3986·260	180 —	3
5475·329	2668 —	16
99·296	2708 +	11
5508·258	2723 —	4
26·220	2753 +	2
5740·486	3111 +	3
·508	3111 +	25
6155·244	3804 —	3
6562·206	4484 —	24
·228	4484 —	2
63·419	4486 —	8
·441	4486 +	14
66·428	4491 +	8

207

d	t	d
2423878·556	0 —	·005
79·512	2 —	14
·539	2 +	13
4298·423	870 —	14
·446	870 +	9
5479·420	3317 +	19
5509·329	3379 +	6
6155·550	4718 +	2
6562·378	5561 —	16
66·252	5569 —	3
67·223	5571 +	3

208

d	t	d
2423883·575	0 +	·025
4029·225	246 —	8
5360·498	2494 —	15
83·605	2533 —	4
5465·342	2671 +	8
5507·372	2742 —	8
23·362	2769 —	8
61·258	2833 —	13
6155·244	3836 —	10
6563·312	4525 +	27
66·252	4530 +	6

209

d	t	d
2423994·338	0 —	·015
4025·299	59 +	16
5360·498	2606 —	19
81·485	2646 —	2
5410·344	2701 +	24
65·364	2806 —	1
73·253	2821 +	25
74·254	2823 —	23
·276	2823 —	2
·298	2823 +	21
75·306	2825 —	19
·329	2825 +	4
5507·307	2886 +	3
·329	2886 +	25
27·223	2924 —	2
5719·608	3291 —	12
90·367	3426 —	25
91·418	3428 —	23
·440	3428 —	1
6155·244	4122 —	18
56·324	4124 +	13
6241·268	4286 +	31
6566·252	4906 —	13
·276	4906 +	11

210

d	t	d
2423986·260	0 —	·021
92·289	10 —	6
4292·440	509 +	29
5393·638	2340 +	2
5474·231	2474 +	2
6242·260	3751	0
6562·228	4283 +	5
63·419	4285 —	7
66·428	4290 —	5

212

d	t	d
2424029·225	0 +	·011
30·263	2 +	4
31·285	4 —	19
·309	4 +	5
5410·344	2643 +	26
79·280	2775 —	15
·303	2775 +	8
5501·234	2817 —	8
·257	2817 +	15
24·217	2861 —	17
5797·510	3384 —	19
6562·528	4848 —	17
66·207	4855 +	4
·229	4855 +	26
67·244	4857 —	4

TABLE 5 (*continued*).

213

d	t	d
2424029·249	0	+ ·002
5420·495	2584	− 16
42·577	2625	− 9
·599	2625	+ 13
73·275	2682	− 1
75·420	2686	− 10
80·258	2695	− 17
·279	2695	+ 4
5501·285	2734	+ 11
08·258	2747	− 15
·280	2747	+ 7
22·277	2773	+ 5
23·362	2775	+ 13
5707·505	3117	+ 18
6562·486	4705	− 3

214

d	t	d
2423883·575	0	− ·001
4012·371	241	+ 30
4294·433	769	− 15
5415·427	2867	+ 32
38·347	2910	− 23
·369	2910	− 1
·417	2910	+ 47
5500·311	3026	− 37
·356	3026	+ 8
22·236	3067	− 18
61·234	3140	− 24
5706·521	3412	− 64
38·603	3472	− 40
6093·506	4136	+ 92
6155·431	4252	+ 39
6561·459	5012	+ 4
62·507	5014	− 17
66·252	5021	− 12

215

d	t	d
2424019·253	0	+ ·015
30·222	18	+ 10
4298·446	458	− 2
5437·231	2326	− 3
79·280	2395	− 18
·325	2395	+ 27
99·385	2428	− 31
5507·350	2441	+ 9
26·220	2472	− 20
32·288	2482	− 48
51·233	2513	− 2
5791·440	2907	+ 12
6155·431	3504	+ 55
6566·264	4178	− 2

216

d	t	d
2423965·374	0	− ·006
4026·295	115	− 15
·320	115	+ 10
5337·632	2590	+ 5
61·449	2635	− 20
5437·231	2778	− 3
42·533	2788	+ 1
·555	2788	+ 23
73·253	2846	− 9
·275	2846	+ 13
82·265	2863	− 4
5508·236	2912	+ 6
26·242	2946	− 3
53·264	2997	− 2
61·234	3012	+ 21
2425719·630	3311	− 1
6090·506	4011	− 2
6566·276	4909	− 15

217

d	t	d
2423880·546	0	− ·018
83·546	4	− 15
4016·247	181	+ 51
4293·436	551	− 18
5381·485	2003	− 20
5507·350	2171	− 45
·372	2171	− 23
26·220	2196	+ 91
6156·324	3037	− 5
6562·464	3579	− 11
63·250	3580	+ 26
65·449	3583	− 23
66·229	3584	+ 8

218

d	t	d
2423880·517	0	+ ·011
3992·264	244	+ 5
4024·325	314	+ 5
25·226	316	− 10
30·263	327	− 11
5441·379	3408	− 12
45·517	3417	+ 4
51·455	3430	− 12
·477	3430	+ 10
5507·329	3552	− 15
·350	3552	+ 6
5707·505	3989	+ 12
39·546	4059	− 7
45·526	4072	+ 19
94·497	4179	− 17
·519	4179	+ 5
6155·431	4967	+ 8
6563·505	5858	− 1
66·252	5864	− 2

219

d	t	d
2423990·345	0	+ ·005
4017·225	49	+ 13
18·295	51	− 14
29·297	71	+ 20
30·360	73	− 14
4264·540	500	− 5
97·446	560	− 3
5441·431	2646	+ 1
42·533	2648	+ 6
73·231	2704	− 6
75·420	2708	− 11
79·280	2715	+ 10
5507·216	2766	− 23
24·239	2797	0
5808·339	3315	+ 24
6093·495	3835	+ 7
6562·378	4690	+ 1
63·462	4692	− 12
66·218	4697	+ 2

220

d	t	d
2424020·395	0	+ ·012
5480·323	3041	− 9
82·243	3045	− 9
5738·603	3579	− 17
91·418	3689	− 12
·440	3689	+ 11
6090·527	4312	+ 3
2426155·341	4447	+ 5
6561·481	5293	− 10
62·464	5295	+ 13
63·419	5297	+ 7
66·299	5303	+ 7

221

d	t	d
2423996·264	0	+ ·011
4028·304	70	− 6
·328	70	+ 18
29·225	72	− 1
4293·460	649	− 4
5415·427	3099	− 17
65·342	3208	− 18
5508·385	3302	− 23
09·329	3304	+ 5
31·304	3352	− 1
5798·305	3935	+ 14
6563·527	5606	0
·548	5606	+ 21
66·276	5612	+ 1

222

d	t	d
2424029·249	0	+ ·030
33·293	7	+ 14
5383·605	2335	+ 10
5451·455	2452	− 4
·477	2452	+ 18
65·342	2476	− 38
·364	2476	− 16
79·280	2500	− 20
·303	2500	+ 3
5508·303	2550	+ 1
22·236	2574	+ 13
5745·504	2959	− 31
·526	2959	− 9
98·305	3050	− 13
99·440	3052	− 38
·462	3052	− 16
6155·638	3666	+ 20
6562·206	4367	− 15
·228	4367	+ 7
63·376	4369	− 5
·398	4369	+ 17
66·276	4374	− 5
·299	4374	+ 18
·342	4374	+ 61

223

d	t	d
2423990·345	0	+ ·010
91·293	2	− 8
92·264	4	− 4
4020·305	62	+ 2
5420·562	2959	− 16
73·253	3068	− 11
·275	3068	+ 11
74·231	3070	+ 1
·253	3070	+ 23
·276	3070	+ 46
99·340	3122	− 25
·363	3122	− 2
5500·311	3124	− 20
·334	3124	+ 3
5501·285	3126	− 13
61·234	3250	0
6090·506	4345	0
·527	4345	+ 21
6242·260	4659	− 19
6562·271	5321	+ 12
63·211	5323	− 15
·232	5323	+ 6

224

d	t	d
2423992·289	0	− ·014
4025·275	70	+ 5
33·269	87	− 8
·293	87	+ 16
5410·369	3011	− 8
5500·311	3202	− 20
·334	3202	+ 3
·356	3202	+ 25
01·285	3204	+ 12
02·217	3206	+ 2
5740·508	3712	− 15
97·510	3833	+ 1
5808·339	3856	− 3
6155·431	4593	− 11
56·400	4595	+ 16
6563·290	5459	− 8
·312	5459	+ 14
64·231	5461	− 8

231

d	t	d
2424030·222	0	− ·007
5420·562	2469	− 21
41·431	2506	+ 12
42·533	2508	− 12
42·555	2508	+ 10
80·279	2575	+ 4
98·278	2607	− 17
5507·350	2623	+ 45
51·233	2701	+ 5
5719·608	3000	+ 6
94·497	3133	− 1
6155·431	3774	− 30
6561·459	4495	− 14
63·211	4498	+ 48
66·513	4504	− 28

235

d	t	d
2424020·305	0	− ·016
22·277	3	− 10
4292·440	415	+ 29
5551·233	2335	− 4
6156·400	3258	+ 8
6562·206	3877	− 26
·228	3877	− 4
·249	3877	+ 17
6563·548	3879	+ 5

236

d	t	d
2425474·231	0	+ ·005
5500·356	51	− 5
·400	51	+ 39
9716·592	473	− 24
91·418	619	− 15
·440	619	+ 7
94·497	625	− 11
·519	625	+ 11
5808·339	652	− 5
6156·274	1331	− 25
6563·211	2125	+ 26
64·209	2127	− 1

237

d	t	d
5451·455	0	− ·012
5739·546	612	− 20
97·488	735	+ 20
5825·248	794	+ 6
6155·244	1495	+ 6
6218·323	1629	+ 5
2426243·290	1682	+ 22
6480·515	2186	− 10
6570·425	2377	− 13
·446	2377	+ 8
73·252	2383	− 11

238

d	t	d
2423990·345	0	+ ·013
94·289	7	− 20
5393·614	2470	+ 15
5482·243	2626	+ 17
·265	2626	+ 39
99·251	2656	− 19
5500·400	2658	− 6
07·216	2670	− 8
08·385	2672	+ 25
24·239	2700	− 28
53·242	2751	0
5797·510	3181	− 25
5808·339	3200	+ 10
6093·506	3702	− 22
6562·228	4527	− 2
63·333	4529	− 33
·355	4529	− 11
·398	4529	+ 32
66·229	4534	+ 22

239

d	t	d
2423987·285	0	− ·010
4031·333	63	+ 40
4264·529	397	− 26
92·464	437	− 27
5385·463	2002	− 6
5445·517	2088	− 14
5716·592	2476	+ 87
39·562	2509	+ 10
·572	2509	+ 20
97·488	2592	− 31
·510	2592	− 9
6562·228	3687	− 26
·249	3687	− 5
66·428	3693	− 17
71·347	3700	+ 14

240

d	t	d
2424025·299	0	− ·009
4293·460	569	− 9
5391·629	2899	+ 64
5441·507	3005	− 14
46·217	3015	− 17
5561·234	3259	+ 6
5745·504	3650	+ 3
64·352	3690	0
94·497	3754	− 17
98·305	3762	+ 20
6241·268	4702	− 25
42·244	4704	+ 8
6562·228	5383	− 11
66·470	5392	− 11
·492	5392	+ 13

242

d	t	d
2423878·5296	0	− ·0006
4298·4229	2866	+ 97
5420·4951	10525	+ 12
42·3173	10674	− 58
98·2783	11056	− 97
5507·3723	11118	+ 10
25·2256	11240	− 193

TABLE 5 (*continued*).

d	t	d
·2484	11240 +	35
5716·5924	12546 +	122
6562·5070	18320 +	77

245

d	t	d
2424028·255	0 —	·037
4292·464	401 +	20
5442·599	2147 +	3
99·251	2233 +	4
5501·234	2236 +	11
·257	2236 +	34
22·277	2268 —	26
26·242	2274 —	13
53·264	2315 +	1
61·234	2327 +	66
5716·592	2563 —	38
6562·421	3847 —	25
·443	3847 —	3
·464	3847 +	18
66·384	3853 —	14

246

d	t	d
2424026·2954	0 +	·0032
5360·4984	695 +	231
85·4398	708 +	85
5410·3686	721 —	186
37·2528	735 —	100
5508·2805	772 —	108
31·3258	784 —	17
6562·2063	1321 +	63

248

d	t	d
2424025·226	0 +	·005
5420·562	2546 +	6
41·379	2584 —	3
75·329	2646 —	32
80·301	2655 +	8
·323	2655 +	30
5502·217	2695 +	2
25·226	2737 —	7
5745·526	3139 —	23

d	t	d
6565·428	4635 —	4
·449	4635 +	17

250

d	t	d
2423881·552	0 —	·006
5442·511	2776 +	8
51·477	2792 —	23
5508·280	2893 —	12
5904·223	3597 +	71
6561·459	4766 —	21
·481	4766 +	1
6565·428	4773 +	12
66·513	4775 —	28

255

d	t	d
2424017·254	0 +	·007
29·249	22 —	17
5383·605	2501 —	1
5410·369	2550 —	7
42·599	2609 —	10
·632	2609 +	23
5798·305	3260 +	38
6155·550	3914 —	14
6566·363	4666 —	37
·384	4666 —	16
·406	4666 +	6
71·347	4675 +	30

268

d	t	d
2424293·436	0 —	·011
5501·234	1697 +	5
5799·440	2116 +	1
·462	2116 +	23
6562·378	3188 —	21
·400	3188 +	1

272

d	t	d
2423988·368	0 +	·009
98·264	92 +	4
4012·346	223 —	12
19·253	287 +	7
32·266	408 —	2
4261·611	2539 +	5
93·460	2835 —	1
5360·498	12750 —	13
81·508	12945 +	12
85·486	12982 +	8
91·605	13039 —	8
5410·344	13213 +	5
20·562	13308	0
45·517	13540 —	13
51·477	13595 +	28
74·457	13809 —	23
79·420	13855 —	10
80·258	13863 —	33
99·340	14040	0
5507·307	14114 +	3
08·385	14124 +	5
27·223	14299 +	9
5739·562	16272 +	15
6565·428	23946 +	7

273

d	t	d
2424056·302	0 +	·022
4297·423	456 +	3
98·446	458 —	32
5337·608	2423 +	4
81·508	2506 +	13
83·605	2510 —	6
5794·497	3287 —	5

283

d	t	d
2424292·440	0 —	·011
5415·427	2456 —	2
41·507	2513 +	15
5507·350	2657 +	16
08·258	2659 +	10
24·239	2694 —	13
6093·506	3939 —	8
6563·548	4967 —	7

303

d	t	d
2423877·528	0 —	·026
·555	0 +	1
3992·264	165 +	19
94·338	168 +	8
4017·225	201 —	44
26·320	214 +	15
33·244	224 —	12
·269	224 +	13
5393·614	2181 +	50
·638	2181 +	64
5441·507	2250 —	19
74·231	2297 +	35
·276	2297 +	80
76·255	2300 —	26
5501·257	2336 —	48
·285	2336 —	20
5508·211	2346 —	45
·236	2346 —	20
·258	2346 +	2
·280	2346 +	24
24·239	2369 —	4
5719·608	2650 +	42
95·328	2759 —	4
99·462	2765 —	40
6093·484	3188 —	45
·506	3188 —	23
6155·409	3277 +	16
6242·244	3402 —	36
6563·398	3864 —	18
·419	3864 +	3
65·449	3867 —	52
66·207	3868 +	11
·229	3868 +	33
·252	3868 +	56

309

d	t	d
2423881·552	0 —	·016
3988·368	222	0
4016·247	280 —	24
·271	280 —	0
4028·304	305 +	6
4261·611	790 —	13
·636	790 +	12
4264·529	796 +	19
5385·440	3126 +	5
·463	3126 +	28
5393·614	3143	0
·638	3143 +	24
5475·420	3313 +	22
5500·400	3365 –	14
5791·440	3970 —	30
6155·638	4727 —	13
6242·244	4907 —	2
6566·492	5581 —	4

310

d	t	d
2423996·238	0 —	·021
·264	0 +	5
3997·296	2 +	5
4028·255	62 +	8
29·273	64 —	6
30·335	66 +	24
31·333	68 —	10
4264·529	520 —	19
·552	520 +	4
93·436	576 —	5
·460	576 +	19
94·454	578 —	18
5383·605	2689 —	18
5438·347	2795 +	34
41·431	2801 +	23
45·517	2809 —	19
5501·234	2917 —	23
·257	2917	0
·285	2917 +	28
5738·603	3377 +	13
95·328	3487 —	15
99·462	3495 —	9
5904·223	3698 +	16
6562·528	4974 —	19
·550	4974 +	3

TABLE 6.

35

n	phase	brightness
	P	st
10	·017	6·09
10	·049	7·31
10	·085	8·90
10	·118	9·74
10	·162	9·85
10	·205	10·88
10	·250	11·14
10	·283	12·86
10	·314	12·03
10	·341	12·72
10	·371	12·16
10	·400	12·96
10	·426	12·69
10	·454	12·87
10	·496	12·87
10	·536	12·75
10	·575	13·28
10	·625	14·52
10	·679	14·23
10	·728	12·53
10	·765	10·27
10	·798	6·09
10	·824	1·66
10	·856	·81
10	·878	·89
10	·908	2·45
10	·933	1·55
10	·954	4·42
11	·978	4·35

42

n	phase	brightness
	P	st
10	·012	13·94
10	·037	7·75
10	·069	2·28
10	·094	1·32
10	·117	·87
10	·136	3·67
10	·172	4·35
10	·205	6·67
10	·231	7·55
10	·261	8·86
10	·292	9·46
10	·322	10·44
10	·356	12·29
10	·384	12·91
10	·414	13·26
10	·446	14·73
10	·469	13·67
10	·500	15·02
10	·521	15·64
10	·553	16·12
10	·590	16·28
10	·619	16·29
10	·645	16·81
10	·666	16·34
10	·683	16·17
10	·722	16·57
10	·746	16·09
10	·777	16·57
10	·803	16·20
10	·846	15·96
10	·881	16·72
10	·920	16·75
9	·945	16·62
9	·966	16·21
9	·988	15·18

112

n	ph se	brightness
	P	st
11	·018	11·57
10	·055	9·65
10	·106	10·27
10	·171	10·90
10	·237	13·38
10	·291	13·82
10	·330	12·46
10	·361	12·66
10	·395	12·90
10	·437	13·71
10	·501	13·02
10	·552	14·07
10	·599	12·13
5	·645	6·86
5	·664	4·36
10	·694	2·80
10	·726	2·79
10	·758	2·44
10	·787	4·83
10	·817	5·71
10	·845	6·26
10	·873	6·70
10	·907	7·97
10	·940	7·90
10	·978	9·63

115

n	phase	brightness
	P	st
10	·010	15·50
10	·056	15·87
10	·100	16·09
10	·148	16·38
10	·187	17·06
10	·219	16·48
10	·244	17·08
9	·262	16·44
10	·277	16·57
10	·298	16·16
10	·322	17·14
10	·356	17·06
10	·389	16·57
10	·419	17·23
10	·446	16·64
10	·471	15·91
10	·499	11·91
9	·529	7·29
9	·554	5·93
10	·584	6·85
10	·630	8·19
10	·670	9·57
10	·703	10·71
10	·732	11·01
10	·778	12·67
10	·840	13·82
10	·900	14·73
10	·963	14·93

118

n	phase	brightness
11	·018	11·99
10	·053	11·66
10	·075	11·53
10	·119	10·35
10	·169	10·29
10	·205	9·19
10	·236	8·14
10	·267	8·30
10	·305	8·25
10	·340	8·54

TABLE 6 (*continued*).

n	phase	brightness
	P	st
10	·371	7·25
10	·405	7·76
10	·434	7·01
10	·489	6·75
10	·538	6·96
10	·580	8·36
10	·608	6·80
10	·631	8·60
10	·661	8·31
10	·681	9·13
10	·715	9·43
10	·736	9·18
10	·768	10·64
10	·798	11·00
10	·837	10·75
10	·868	11·87
10	·899	12·62
10	·925	12·01
11	·961	12·11
10	·986	11·47
	119	
11	·017	4·08
10	·047	7·07
11	·086	7·62
10	·117	9·46
10	·156	10·25
11	·196	11·27
10	·239	12·34
10	·279	12·84
10	·330	14·24
10	·389	13·84
10	·426	14·81
10	·462	15·00
11	·494	15·94
10	·533	14·75
10	·572	14 57
10	·607	14·93
10	·648	15·35
10	·684	15·50
10	·723	16·04
11	·750	16·42
11	·780	15·34
10	·810	15·38
10	·869	14·67
10	·911	11·01
10	·938	6·36
10	.961	3·07
10	·985	3·62
	120	
10	·018	2·58
10	·052	2·87
10	·096	2·37
10	·130	2·43
10	·157	2·88
10	·178	2·73
10	·201	3·27
10	·233	2·62
10	·259	3·57
10	·288	4·44
10	·317	4·77
10	·346	4·24
10	·376	5·70
10	·416	6·13

n	phase	brightness
	P	st
10	·435	7·12
10	·462	6·93
10	·496	7·44
10	·520	7·76
10	·550	7·45
10	·576	8·32
10	·616	6·97
10	·641	7·69
10	·681	7·19
10	·704	8·09
10	·726	8·15
10	·760	7·82
10	·786	6·37
10	·815	6·71
10	·846	5·67
10	·868	6·56
10	·891	3·81
10	·921	3·12
11	·950	2·90
11	·975	2·52
	121	
10	·012	10·55
10	·029	11·34
11	·054	11·68
10	·079	12·50
10	·103	12·78
11	·129	13·29
10	·149	13·06
10	·177	13·12
10	·216	13·31
10	·254	14·24
10	·295	14·05
10	·338	15·87
10	·383	13·88
10	·419	13·53
10	·461	14·74
10	·497	15·11
10	·530	15·21
10	·584	13·91
10	·621	11·42
10	·655	8·66
10	·690	7·55
10	·717	6·61
10	·750	4·70
10	·778	5·43
10	·803	5·39
10	·832	6·20
10	·879	7·49
10	·924	8·36
10	·966	10·04
10	·988	10·22
	122	
10	·028	7·44
10	·096	9·05
10	·166	10·00
10	·217	8·38
10	·242	10·01
10	·270	9·31
10	·298	9·56
10	·345	9·37
10	·380	10·61
10	·403	10·46
10	·436	10·43

n	phase	brightness
	P	st
10	·496	10·66
10	·567	10·88
10	·611	11·24
10	·664	7·81
10	·720	6·33
10	·759	4·09
10	·785	3·88
10	.813	5·12
10	·843	4·75
10	·890	5·81
10	·934	6·54
11	·977	7·88
	123	
10	·037	8.68
10	·094	7·20
10	·132	7·13
10	·180	4·44
10	·213	3·92
10	·243	3·62
10	·281	3·44
10	·317	4·36
10	·356	4·21
10	·402	6·15
10	·444	5·90
10	·478	6·27
10	·520	6.89
10	·558	7·49
10	·600	6·94
10	·630	8·00
10	·670	7·61
10	·712	7·54
10	·760	8·73
10	·823	8·90
10	·872	8·31
10	·925	8·35
10	·972	8·55
	125	
10	·015	13·71
10	·046	14·48
10	·068	14·17
10	·100	13·49
3	·113	13·50
3	·132	9·37
3	·142	6·13
10	·155	4·34
10	·187	·42
10	·218	—1·50
10	·258	1·10
10	·290	2·64
10	·314	2·83
10	·332	3·32
10	·369	5·00
10	·399	4·76
10	·426	7·43
10	·451	6·62
10	·469	8·38
10	·492	8·22
10	·511	10·00
10	·529	8·83
10	·551	10·21
10	·570	11·92
10	·595	12·15
10	·612	13·82

n	phase	brightness
	P	st
10	·644	12·47
10	·665	12·97
10	·692	13·47
10	·724	14·36
10	·771	14·49
10	·816	14·32
10	·851	14·59
10	·887	14·10
10	·932	13·79
10	·979	13·46
	126	
30	·028	8·04
30	·077	7·69
30	·129	6·90
30	·168	6·00
30	·220	4·32
30	·271	2·68
30	·336	2·12
30	·398	2·25
30	·460	2·20
30	·531	2·63
30	·596	2·92
30	·657	4·03
30	·712	5·53
30	·773	6·06
30	·838	6·29
30	·910	7·04
28	·973	7·68
	128	
10	·022	7·72
10	·060	4·32
10	·092	4·26
10	·122	4·64
10	·157	6·55
10	·186	7·62
10	·219	7·56
10	·275	8·64
10	·334	9·85
10	·387	10·84
10	·452	11·83
10	·510	12·14
10	·544	11·94
10	·585	12·16
10	·641	13·12
10	·707	12·99
10	·774	12·90
10	·837	13·32
10	·898	13·13
10	·948	13·92
10	·988	11·60
	130	
10	·024	14·29
10	·048	14·65
10	·079	14·20
10	·110	15·22
10	·131	15·35
10	·159	15·02
10	·189	16·00
10	·225	15·75
10	·260	16·15
10	·292	15·65
10	·338	15·38
10	·382	16·31

n	phase	brightness
	P	st
10	·426	15·27
10	·459	16·10
10	·490	15·94
10	·526	16·05
10	·559	15·86
10	·600	13·51
10	·631	9·99
10	·668	4·61
10	·697	4·68
10	·727	6·39
10	·763	7·02
10	·795	8·73
10	·832	9·52
10	·860	9·75
10	·889	11·71
10	·923	11·90
10	·945	12·68
10	·982	13·66
	131	
14	·049	10·14
14	·117	10·09
14	·177	9·99
14	·227	10·01
14	·274	10·22
14	·324	10·74
14	·382	10·76
14	·427	11·32
14	·465	9·67
14	·493	8·46
14	·511	7·74
14	·538	5·53
14	·575	4·08
14	·644	6·01
14	·790	7·87
14	·892	9·31
14	·947	9·53
	133	
10	·013	4·98
10	·038	4·67
10	·061	4·37
10	·090	4·28
10	·117	4·91
10	·142	4·93
10	·168	4·70
10	·193	4·77
10	·219	5·05
10	·252	5·93
10	·277	6·85
10	·301	8·23
10	·327	13·68
10	·352	16·11
10	·383	14·99
10	·414	10·31
10	·437	8·00
10	·454	6·23
10	·480	5·65
10	·513	5·67
10	·540	5·44
10	·565	5·19
10	·587	4·78
10	·614	4·41
10	·646	5·00
10	·668	5·09

n	phase	brightness
	P	st
10	·697	4·92
10	·727	4·89
10	·765	5·52
10	·794	5·51
10	·819	5·67
10	·846	6·83
10	·879	6·91
10	·916	5·71
9	·937	5·56
9	·964	5·40
9	·986	5·04
	134	
10	·019	17·73
10	·060	17·66
10	·096	18·25
10	·144	18·10
10	·198	17·84
10	·245	18·05
10	·281	18·23
10	·323	17·48
10	·360	18·25
10	·385	18·61
10	·411	17·16
10	·438	14·21
10	·467	11·85
10	·487	11·09
10	·511	7·39
10	·532	8·06
10	·556	8·63
10	·586	9·63
10	·613	9·48
10	·645	11·54
10	·684	12·07
10	·710	12·96
10	·735	14·28
10	·761	14·19
10	·797	15·20
10	·832	15·21
10	·867	16·27
10	·899	16·59
10	·935	16·73
11	·979	17·23
	135	
10	·031	11·70
10	·082	5·55
10	·127	4·21
10	·174	5·59
10	·227	5·72
10	·283	9·47
10	·326	8·69
10	·413	12·85
10	·457	13·26
10	·503	14·02
10	·549	14·34
10	·590	14·91
10	·628	16·05
10	·666	16·60
10	·703	15·98
10	·753	16·42
10	·794	15·91
9	·833	15·99
9	·894	16·16
9	·975	15·60

n	phase	brightness
	136	
	P	st
10	·030	20·50
10	·066	20·93
10	·107	21·55
10	·144	21·36
10	·167	21·41
5	·195	18·54
5	·230	9·34
10	·264	1·71
10	·302	·88
10	·348	3·92
10	·378	5·93
10	·409	7·23
10	·434	8·84
10	·462	9.86
10	.479	10·44
10	·498	10·82
10	·522	11·91
10	·544	12·99
10	·566	14·52
10	·603	14·67
10	·633	15·31
10	·660	16·51
10	·683	16·94
10	·707	16·62
10	·729	17·83
10	·750	18·24
10	·778	19·96
10	·810	19·69
10	·833	19·83
10	·860	19·93
10	·887	20·75
10	·914	20·87
10	·943	20·18
9	·973	21·23
	138	
5	·005	10·54
5	·033	9·20
10	·079	4·41
10	·108	4·53
10	·135	5·30
10	·169	5·92
10	·223	6·20
10	·291	7·75
10	·324	9·23
10	·353	8·21
10	·401	9·02
10	·449	9·34
10	·491	10·30
10	·524	10·38
10	·569	11·30
10	·621	11·22
10	·669	10·70
10	·711	11·10
10	·753	9·88
10	·795	10·57
10	·830	11·07
9	·865	10·57
9	·898	10·84
9	·930	10·97
9	·969	11·30
	139	
10	·024	17·65

n	phase	brightness
	P	st
10	·064	18·45
10	·095	18·09
10	·138	18·02
10	·196	14·18
10	·226	12·30
5	·242	9·68
5	·257	6·66
10	·287	5·33
10	·325	5·94
10	·355	8·53
10	·399	9·90
10	·469	12·5c
10	·511	13·58
10	·540	13·70
10	·575	14·80
10	·616	15·68
10	·664	16·30
10	·698	16·71
10	·733	16·81
10	·775	17·28
10	·807	17·16
10	·848	16·83
10	·890	17·85
11	·940	17·38
11	·982	17·65
	141	
11	·025	13·30
11	·083	13·41
11	·131	14·11
10	·199	14·88
10	·271	14.17
10	·336	15·16
10	·403	15·22
10	·438	14·95
10	·481	15·24
10	·537	15·93
10	·606	15·04
10	·675	15·77
10	·718	14·91
10	·757	11·78
10	·792	6·43
10	·826	5·90
10	·853	7·24
10	·886	7·92
10	·922	9·43
10	·972	10·98
	143	
	I	
10	·031	12·05
9	·100	10·40
3	·164	5·17
4	·208	—1·25
3	·233	·33
10	·281	2·49
10	·346	5·05
10	·404	5·61
10	·457	8·03
10	·511	9·26
10	·582	10·44
10	·669	10·72
10	·743	11·70
10	·851	11·72
10	·948	11·80

TABLE 6 (*continued*).

n	phase	brightness
	II	
	P	st
10	·029	12·32
10	·078	11·42
10	·121	12·57
10	·171	8·85
5	·211	2·90
5	·244	·44
5	·276	—·60
5	·312	3·12
10	·357	2·80
10	·418	4·47
10	·476	6·71
10	·523	7·76
10	·579	8·69
10	·626	10·60
10	·673	10·71
10	·730	11·21
10	·834	11·27
10	·908	12·41
10	·944	11·25
11	·983	12·50
	III	
7	·062	11·51
2	·130	8·65
1	·153	7·00
1	·168	2·00
1	·171	1·50
1	·194	—2·00
2	·210	—·50
3	·247	·07
4	·296	2·10
6	·357	5·80
6	·423	5·72
6	·504	8·83
6	·618	10·32
6	·716	11·57
6	·905	11·18
	144	
10	·005	10·64
10	·031	10·53
10	·054	10·82
10	·089	11·13
10	·120	10·00
5	·147	7·64
5	·156	6·04
5	·176	4·34
5	·192	1·62
10	·209	·20
10	·234	—·40
10	·263	—·06
10	·292	·88
10	·333	1·92
10	·361	3·81
10	·394	3·91
10	·429	4·44
10	·457	5·51
10	·497	6·69
10	·529	7·37
10	·556	8·27
10	·581	8·40
10	·604	8·90
10	·635	9·43
10	·659	9·59

n	phase	brightness
	P	st
10	·684	9·73
10	·709	10·28
10	·739	10·90
10	·785	10·01
10	·823	10·73
10	·852	10·36
10	·882	10·87
10	·907	10·09
10	·933	9·88
10	·952	10·11
11	·986	10·67
	145	
10	·014	7·83
10	·050	8·82
10	·085	9·65
10	·128	9·69
10	·175	10·21
10	·206	10·24
10	·235	10·75
10	·278	10·84
10	·322	11·97
10	·359	11·43
10	·409	11·56
10	·457	11·43
10	·499	11·58
10	·563	11·40
10	·621	11·64
10	·681	11·41
10	·760	11·31
5	·787	10·92
5	·804	8·96
5	·815	7·26
5	·839	3·96
9	·865	3·44
9	·912	4·67
9	·946	6·24
9	·981	7·89
	146	
11	·017	11·33
11	·063	12·20
11	·098	11·69
10	·128	10·78
5	·165	8·20
5	·180	3·58
10	·211	·17
10	·236	—·81
10	·259	—·03
10	·282	1·23
10	·309	2·24
10	·338	3·16
10	·360	4·73
10	·388	5·56
10	·413	4·41
10	·433	6·52
10	·454	6·45
10	·480	6·89
10	·511	7·93
10	·548	8·94
10	·588	9·30
10	·633	10·76
10	·675	10·08
10	·708	10·28
10	·739	10·87

n	phase	brightness
	P	st
10	·771	10·16
10	·817	10·25
10	·860	11·51
10	·892	11·92
10	·916	11·45
11	·947	11·19
11	·980	11·61
	147	
10	·056	11·26
10	·115	12·16
10	·158	12·21
10	·205	12·87
10	·258	12·25
10	·314	12·06
10	·364	12·57
10	·398	11·96
10	·438	12·18
10	·496	11·97
10	·542	12·48
10	·576	8·88
10	·610	4·25
10	·640	3·34
10	·671	3·21
10	·709	3·67
10	·748	4·88
10	·799	7·36
10	·856	7·69
10	·916	9·64
10	·954	10·16
9	·988	10·17
	149	
10	·015	3·95
10	·042	4·22
10	·075	3·85
10	·107	3·45
10	·146	3·16
10	·187	3·10
10	·215	3·41
10	·247	3·06
10	·283	2·80
10	·312	3·11
10	·346	2·93
10	·379	3·04
10	·403	3·52
10	·429	3·59
10	·472	3·70
10	·502	4·25
10	·535	4·25
10	·582	5·47
10	·609	6·44
10	·642	6·51
10	·667	6·86
10	·696	6·70
10	·720	6·64
10	·750	7·47
10	·781	7·20
10	·806	7·11
10	·843	7·02
10	·872	6·20
10	·908	5·84
10	·940	6·00
10	·963	4·94
10	·989	4·83

n	phase	brightness
	150	
	P	st
10	·036	12·29
10	·077	12·52
10	·126	12·16
10	·178	12·30
10	·228	12·67
10	·274	12·33
10	·335	12·33
10	·392	11·80
10	·444	11·10
5	·470	7·58
10	·498	4·71
10	·516	4·31
10	·538	2·82
10	·555	4·67
10	·572	4·33
10	·596	5·68
10	·619	6·31
10	·643	6·93
10	·672	7·79
10	·700	7·48
10	·732	8·80
10	·766	9·45
10	·799	10·26
10	·830	10·39
10	·865	11·21
10	.899	11·88
10	·936	11·58
10	·977	12·19
	154	
10	·009	5·13
10	·046	5·50
10	·085	6·06
10	·138	7·83
10	·182	6·85
10	·224	7·19
10	·260	9·00
10	·289	8·76
10	·327	8·81
10	·363	8·73
10	·412	10·04
10	·452	9·40
10	·489	9·30
10	·520	10·33
10	·560	9·97
10	·610	10·50
10	·647	10·10
10	·683	10·03
10	·716	9·08
10	·753	9·51
10	·792	8·83
10	·833	8·56
10	·872	5·75
10	·912	3.72
10	·938	3·72
10	·959	3·48
10	·983	3·08
	155	
	II	
10	·038	6·72
10	·093	7·30
10	·132	7·37

n	phase	brightness
	P	st
10	·179	7·35
10	·225	8·17
10	·273	7·69
10	·345	8·81
10	·416	8·33
10	·519	9·22
10	·574	8·04
10	·632	8·57
10	·727	—·11
9	·792	—1·63
9	·870	1·22
9	·934	3·64
9	·976	5·58
	III	
10	·205	7·02
10	·402	8·28
10	·549	8·54
9	·650	7·89
9	·775	2·66
9	·896	—·90
	157	
10	·006	5·10
10	·023	5·36
10	·039	5·50
10	·063	5·51
10	·110	4·99
10	·142	5·10
10	·177	5·37
10	·203	5·20
10	·221	4·79
10	·234	5·06
10	·256	4·77
10	·287	5·08
10	·311	4·84
10	·343	4·97
10	·362	5·12
10	·381	5·03
10	·399	5·05
10	·424	5·54
10	·472	5·14
10	·509	5·38
10	·528	5·50
10	·547	5·18
5	·567	5·12
5	·591	6·92
5	·603	7·98
5	·614	10·72
5	·627	12·16
5	·640	12·74
5	.651	13·34
5	·659	12·62
5	·665	11·28
5	·674	9·10
5	·685	8·46
5	·699	6·60
10	·729	5·12
10	·768	4·83
10	·796	4·82
10	·818	4·79
10	·844	5·84
10	·866	5·26

n	phase	brightness
	P	st
10	·889	5·48
10	·950	5·16
11	·988	4·76
	160	
10	·014	5·87
10	·038	6·64
10	·058	6·86
10	·079	6·30
10	·108	6·57
10	·135	6·35
10	·161	6·37
10	·187	6·55
10	·211	6·85
10	·234	6·19
10	·254	6·71
10	·279	6·35
10	·309	6·49
10	·334	6·46
10	·374	6·48
10	·404	6·55
10	·431	6·72
10	·459	6·40
10	·484	6·58
10	·508	6·39
10	·534	6·60
10	·572	6·91
10	·606	6·10
10	·631	6·56
5	·651	6·80
5	·661	8·26
5	·670	9·44
5	·680	11·14
5	·689	13·58
5	·696	14·80
5	·714	16·52
5	·734	11·40
5	·752	8·58
10	·771	6·63
10	·805	6·18
10	·836	6·21
10	·857	6·46
10	·885	6·24
10	·912	5·84
10	·937	6·83
10	·964	6·51
10	·992	6·36
	161	
10	·014	9·34
10	·048	9·29
10	·099	9·77
10	·141	8·84
10	·176	5·67
10	·203	3·60
10	·231	1·91
10	·263	2·51
10	·293	3·87
10	·324	4·34
10	·359	5·48
10	·406	6·13
10	·462	7·23
10	·507	7·39
10	·541	7·85
10	·571	7·64

n	phase	brightness
	P	st
10	·604	8·29
10	·634	8·60
10	·670	8·56
10	·716	8·90
10	·762	9·22
10	·817	9·35
10	·858	9·57
10	·899	9 31
9	·928	9·20
9	·954	9·26
9	·980	8·47
	162	
10	·045	5·65
10	·117	7·19
10	·163	7·42
10	·212	7·15
10	·267	6·88
10	·324	8·06
10	·387	8·20
10	·437	7·94
10	·489	7·61
10	·555	7·91
10	·594	8·32
10	·640	6·90
5	·687	3·90
5	·705	—·72
10	·735	—·82
10	·773	—1·50
10	·815	—·39
10	·846	—·18
10	·881	1·73
10	·909	1·89
11	·951	3·93
11	·988	5·45
	164	
10	·014	8·30
10	·049	9·52
10	·096	11·00
10	·140	11·81
10	·171	12·18
10	·212	12·04
10	·250	13·07
10	·294	13·49
10	·337	14·30
10	·381	13·79
10	·439	13·93
10	·496	13·21
10	·532	14·09
10	·587	13·91
10	·643	13·76
10	·683	13·60
5	·708	13·34
4	·728	9·80
5	·741	8·06
5	·759	5·18
10	·779	3·18
10	·817	3·38
10	·839	4·52
11	·876	4·25
11	·918	6·20
11	·952	7·11
11	·981	7·96

n	phase	brightness
	165	
	p	st
10	·016	6·60
10	·064	7·30
10	·129	6·70
10	·210	6·90
10	·267	7·10
10	·311	7·30
10	·359	7·20
10	·424	7·20
10	·475	7·20
10	·530	7·30
10	·587	5·25
5	·617	2·80
5	·640	1·70
10	·674	1·45
10	·716	2·74
10	·760	3·56
10	·806	4·76
10	·849	5·60
10	·899	5·31
10	·944	6·40
10	·975	5·85
	167	
10	·028	13·17
10	·062	11·72
10	·098	9·60
10	·142	9·14
10	·181	5·96
10	·207	6·50
10	·245	6·10
10	·279	6·01
10	·303	6·63
10	·338	7·24
10	·385	9·84
10	·427	9·81
10	·461	9·31
10	·500	10·85
10	·540	11·02
10	·574	11·04
10	·607	10·73
10	·644	12·36
10	·676	12·04
10	·707	12·08
10	·743	11·81
10	·769	12·96
10	·797	12·42
10	·833	12·03
10	·860	13·34
10	.896	12·85
10	·928	13·45
9	·964	11·33
9	·988	12·90
	168	
10	·022	11·73
10	·055	11·28
10	·097	12·92
10	·151	12·51
10	·192	12·47
10	·236	12·00
5	·270	9·50
5	·298	5·96
10	·320	2·99
10	·348	1·38

TABLE 6 (*continued*).

n	phase	brightness
	P	st
10	·379	2·16
10	·412	3·00
10	·454	5·84
10	·507	7·95
10	·552	8·14
10	·593	9·27
10	·623	9·37
10	·663	10·06
10	·697	10·63
10	·739	11·32
10	·772	12·19
10	·805	11·29
10	·836	11·49
10	·865	11·96
10	·899	12·73
9	·930	11·70
9	·960	12·30
9	·987	11·13
	169	
10	·026	10·12
10	·c66	9·69
10	·121	10·46
10	·176	9·77
10	·232	9·55
10	·279	8·15
10	·313	5·63
10	·359	3·63
10	·452	3·58
10	·530	5·28
10	·584	6·82
10	·626	8·32
10	·658	8·14
10	·698	7·86
10	·752	8·82
10	·802	9·86
10	·846	9·74
10	·872	9·77
9	·908	9·66
9	·952	10·43
9	·988	10·26
	170	
10	·030	6·18
10	·066	3·99
10	·086	4·57
10	·109	3·92
10	·130	5·92
10	·152	6·37
10	·178	6·55
10	·2c6	7·16
10	·246	8·68
10	·279	8·82
10	·323	9·52
10	·379	9·61
10	·427	10·75
10	·474	10·57
10	·531	10·95
10	·582	11·36
10	·639	11·65
10	·688	11·07
10	·731	11·39
10	·778	11·63
10	·830	11·63

n	phase	brightness
	P	st
10	·885	11·56
9	·926	12·00
9	·977	9·99
	172	
10	·012	9·91
10	·047	9·46
10	·078	10·01
10	·115	10·29
10	·144	10·03
10	·187	10·65
10	·224	10·46
10	·265	10·48
10	·304	11·01
10	·343	11·03
10	·384	11·24
10	·436	10·81
10	·473	9·55
10	·508	9·51
10	·537	8·29
10	·572	7·94
10	·608	6·02
10	·640	5·46
10	·681	5·08
10	·722	6·20
10	·765	6·47
10	·828	7·62
10	·885	8·75
10	·939	9·10
11	·980	8·53
	173	
10	·016	4·06
10	·042	4·45
10	·071	4·92
10	·091	5·70
10	·111	5·30
10	·134	6·66
10	·156	5·65
10	·180	7·24
10	·218	7·39
10	·252	8·63
10	·296	9·24
10	·341	9·65
10	·386	10·00
10	·417	10·80
10	·442	10·49
10	·467	10·76
10	·486	10·87
10	·511	11·30
10	·535	11·42
10	·556	10·86
10	·580	11·65
10	·603	11·66
10	·629	11·38
10	·652	12·00
10	·670	11·77
10	·698	11·42
9	·732	12·24
9	·762	11·70
9	·810	12·49
9	·862	10·98
10	·892	6·69
10	·923	6·13

n	phase	brightness
	P	st
10	·942	4·56
9	·964	4·08
9	·986	4·08
	174	
10	·019	11·38
10	·046	8·40
10	·083	6·79
10	·114	7·74
10	·144	7·11
10	·173	9·47
10	·205	9·20
10	·249	10·96
10	·290	11·81
10	·330	12·10
10	·366	12·33
10	·405	13·64
10	·445	13·70
10	·486	13·96
10	·529	15·48
10	·578	15·82
10	·624	15·70
10	·669	15·84
10	·712	15·66
10	·742	15·48
10	·772	15·09
11	·807	16·25
11	·848	15·34
11	·894	15·36
11	·938	16·06
11	·987	13·47
	176	
	I	
2	·028	2·15
3	·044	1·03
3	·083	2·87
3	·151	4·70
3	·199	5·37
3	·234	5·67
3	·282	5·73
3	·328	6·27
3	·365	7·87
3	·425	8·87
3	·877	8·20
3	·952	8·53
2	·993	6·70
	II + III	
11	·050	4·46
10	·142	5·92
10	·210	6·86
10	·271	7·60
10	·311	7·72
10	·359	8·12
10	·419	7·90
10	·476	7·74
10	·529	7·70
10	·576	7·70
10	·631	7·80
10	·690	8·00
10	·743	8·30
10	·785	6·18
5	·822	2·38

n	phase	brightness
	P	st
5	·842	1·90
11	·881	1·38
11	·934	2·15
11	·978	4·10
	177	
10	·028	5·30
10	·079	6·19
10	·108	5·91
10	·135	5·92
10	·168	5·86
10	·195	5·91
10	·234	5·32
10	·282	5·56
10	·311	5·84
10	·344	5·52
10	·360	5·86
10	·372	5·71
10	·388	5·50
10	·408	5·80
10	·430	5·95
10	·458	5·64
10	·493	5·73
10	·525	5·90
10	·549	5·66
10	·578	5·98
5	·599	6·06
3	·614	8·07
3	·620	8·67
3	·625	8·90
3	·633	9·57
3	·639	9·47
3	·654	9·63
3	·666	6·23
10	·700	5·65
10	·729	5·48
10	·753	5·96
10	·773	5·94
10	·792	5·75
10	·824	6·19
10	·861	5·50
10	·888	5·40
11	·912	5·39
11	·947	5·47
11	·970	5·62
11	·989	5·90
	179	
10	·011	3·96
10	·028	5·34
10	·056	5·18
10	·090	5·37
10	·113	6·62
10	·143	6·62
10	·166	7·48
10	·194	8·65
10	·224	8·03
10	·265	9·61
10	·308	9·98
10	·340	10·55
10	·387	10·93
10	·439	10·88
10	·493	11·23
10	·530	11·36
10	·574	11·27

n	phase	brightness
	P	st
10	·627	11·10
10	·662	11·25
10	·697	12·35
10	·734	11·79
10	·773	11·26
10	·818	10·97
10	·861	9·37
9	·895	8·52
9	·932	5·81
9	·966	4·38
9	·988	4·48
	180	
10	·017	11·31
10	·069	10·60
10	·118	10·91
10	·159	11·29
10	·199	10·74
10	·226	11·01
10	·261	9·32
10	·298	5·55
10	·335	3·08
10	·365	4·01
10	·393	4·71
10	·413	4·62
10	·439	4·98
10	·461	6·33
10	·489	7·02
10	·514	7·79
10	·548	8·77
10	·586	8·93
10	·619	9·55
10	·661	9·75
10	·713	10·46
10	·764	10·55
10	·808	10·58
10	·862	11·30
9	·928	11·39
9	·978	10·73
	181	
10	·011	10·94
10	·048	10·32
10	·098	9·64
10	·148	6·93
10	·190	5·17
10	·234	4·60
10	·267	4·37
10	·288	4·24
10	·314	4·78
10	·352	4·36
10	·392	5·30
10	·418	4·48
10	·453	5·90
10	·499	6·93
10	·542	7·09
10	·588	7·86
10	·620	7·96
10	·661	7·07
10	·703	7·81
10	·740	8·85
10	·768	8·13
10	·792	8·88
10	·823	8·51
10	·854	9·22

n	phase	brightness
	P	st
10	·883	8·86
10	·910	8·65
10	·934	9·33
11	·970	9·45
	182	
10	·016	9·26
10	·052	8·34
10	·073	7·69
10	·100	8·46
10	·131	7·18
10	·162	6·73
10	·193	6·59
10	·223	5·52
10	·252	5·87
10	·281	5·60
10	·314	5·39
10	·337	5·75
10	·366	6·01
10	·399	5·44
10	·422	6·42
10	·451	5·79
10	·491	7·19
10	·516	6·87
10	·554	7·21
10	·580	7·59
10	·609	7·22
10	·638	8·24
10	·675	9·00
10	·702	8·59
10	·732	9·55
10	·769	9·36
10	·813	10·09
11	·849	9·84
11	·879	9·56
11	·911	9·89
11	·941	9·45
11	·982	9·48
	183	
10	·009	4·68
10	·036	4·23
10	·052	4·11
10	·072	4·54
10	·098	5·60
10	·125	7·68
10	·151	8·51
10	·186	11·13
10	·220	11·27
10	·242	11·83
10	·280	12·85
10	·324	12·55
10	·368	13·40
10	·406	14·47
10	·436	14·09
10	·467	14·78
10	·503	14·58
10	·545	14·88
10	·578	15·01
10	·607	14·66
10	·640	15·31
10	·670	14·91
10	·724	15·21
10	·789	14·66
10	·832	15·38

n	phase	brightness
	P	st
11	·877	15·49
11	·922	14·73
11	·956	13·82
5	·980	10·90
6	·994	7·80
	184	
	I	
11	·124	11·60
5	·440	9·88
6	·516	7·38
8	·598	9·62
8	·805	10·35
	II	
10	·068	12·80
10	·172	11·60
10	·265	9·43
10	·334	8·22
10	·377	8·93
10	·433	9·23
10	·496	10·36
10	·561	10·68
10	·612	11·69
10	·678	11·32
10	·737	12·45
10	·779	11·50
10	·813	11·60
10	·860	12·24
9	·938	12·91
	III	
10	·097	12·90
10	·264	13·20
10	·483	6·48
8	·643	9·54
9	·787	12·42
9	·919	12·44
	186	
10	·033	8·58
10	·081	9·69
10	·115	9·39
10	·154	10·58
10	·194	10·12
10	·229	10·83
10	·289	10·59
10	·344	11·83
10	·377	10·96
10	·402	11·29
10	·444	11·65
10	·475	11·13
10	·527	11·25
10	·563	11·89
10	·598	11·74
10	·634	12·07
10	·662	11·61
10	·689	10·25
10	·720	8·36
10	·754	3·40
10	·792	3·05
10	·823	3·59
9	·858	4·80

n	phase	brightness
	P	st
9	·890	6·23
9	·926	7·01
9	·982	7·66
	187	
10	·014	1·99
10	·038	2·68
10	·054	1·65
10	·075	1·07
10	·096	95
10	·124	1·60
10	·153	2·14
10	·195	2·26
10	·236	2·88
10	·272	3·72
10	·303	3·82
10	·335	4·54
10	·364	5·12
10	·392	5·00
10	·414	5·02
10	·441	4·95
10	·468	5·62
10	·490	6·21
10	·518	5·87
10	·548	6·88
10	·576	5·84
10	·605	7·35
10	·646	7·31
10	·680	6·76
10	·710	7·05
10	·735	5·65
10	·764	7·54
10	·796	6·91
10	·825	7·27
10	·846	7·36
10	·870	7·81
11	·902	6·65
11	·936	5·52
11	·980	4·16
	188	
10	·024	11·92
10	·074	12·60
10	·114	12·38
10	·148	12·24
10	·177	12·58
10	·201	11·94
10	·230	10·95
5	·260	9·92
5	·282	5·40
10	·309	3·75
10	·337	2·61
10	·359	3·45
10	·379	3·59
10	·410	4·08
10	·443	4·96
10	·483	6·29
10	·521	7·42
10	·566	8·87
10	·597	8·91
10	·621	10·61
10	·658	9·75
10	·701	10·33
10	·738	10·86
10	·777	10·19

TABLE 6 (*continued*).

n	phase	brightness
	P	st
9	·809	11·73
9	·844	11·42
9	·903	11·47
9	·967	10·93
	189	
10	·022	8·05
10	·061	7·47
10	·097	9·02
10	·134	9·32
10	·161	9·58
10	·192	9.70
10	·227	11·50
10	·257	11·34
10	·287	11·99
10	·338	12·53
10	·365	12·94
10	·387	13·32
10	·413	12·60
10	·431	12·65
10	·453	12·92
10	·479	12·71
10	·500	12·35
10	·533	11·77
10	·567	10·65
10	·609	8·88
10	·642	7·85
10	·665	7·28
10	·690	6·79
10	·712	6·82
10	·744	7·07
10	·767	6·55
10	·788	6·32
10	·830	6·10
11	·861	6·78
11	·896	6·71
11	·942	6·46
11	·979	7·17
	190	
11	·017	8·06
10	·064	9·99
10	·100	9·84
10	·127	11·32
10	·162	12·29
10	·200	13·62
10	·246	13·40
10	·298	14·42
10	·345	14·44
10	·390	14·71
10	·445	14·51
10	·486	13·98
10	·532	14·01
10	·577	14·77
10	.620	14·18
10	·672	14·90
10	·703	15·00
10	·738	14·67
10	·776	14·24
5	·815	10·84
5	·839	8·36
5	·854	7·18
5	·871	5·80

n	phase	brightness
	P	st
11	·894	4·81
11	·935	5·71
11	·976	8·57
	191	
10	·015	2·56
10	·043	2·15
10	·078	2·76
10	·117	4·12
10	·169	4·50
10	·206	5·74
10	·249	7·26
10	·279	8·20
10	·312	8·19
10	·348	9·13
10	·393	9·46
10	·430	9·67
10	·456	9·29
10	·483	9·89
10	·522	9·67
10	·564	10·18
10	·594	10·03
10	·624	10·36
10	·650	10·49
10	·677	9·90
10	·698	10·36
10	·732	10·52
11	·811	9·27
11	·893	10·32
11	·932	10·65
5	·957	9·68
6	·984	7·90
	192	
10	·010	3·05
10	·035	3·84
10	·056	4·09
10	·084	5·90
10	·113	6·29
10	·142	6·31
10	·174	8·77
10	·206	9·42
10	·242	10·31
10	·270	11·14
10	·309	11·06
10	·342	11·47
10	·372	11·12
10	·402	12·57
10	·434	12·79
10	·473	12·48
10	·512	12·94
10	·556	13·83
10	·610	13·71
10	·651	14·13
10	·681	12·73
10	·717	12·68
10	·745	13·53
10	·788	13·14
10	·830	14·09
10	·866	13·42
10	·900	13·44
5	·933	8·06
5	·949	5·78
11	·964	5·25
11	·993	2·46

n	phase	brightness
	193	
	P	st
10	·011	13·80
10	·027	13·59
10	·045	14·06
10	·064	13·77
10	·083	13·56
10	·102	14·42
10	·125	14·06
10	·145	14·79
10	·172	14·77
10	·200	14·18
10	·222	11·86
10	·244	12·16
10	·264	8·06
10	·283	7·24
10	·311	5·33
10	·327	5·07
10	·348	4·61
10	·366	4·71
10	·388	5·52
10	·411	5·65
10	·437	6·23
10	·461	7·32
10	·485	8·41
10	·511	9·09
10	·537	9·96
10	·554	9·56
10	·572	9·74
10	·587	10·07
10	·596	9·98
10	·614	11·14
10	·628	10·90
10	·642	10·83
10	·659	11·35
10	·676	12·01
10	·689	11·83
10	·704	11·71
10	·719	11·69
10	·734	12·54
10	·750	12·15
10	·768	13·56
10	·789	12·90
10	·805	12·98
10	·828	13·13
10	·845	12·93
10	·864	13·53
10	·886	13·63
10	·900	13·47
11	·918	12·62
11	·936	13·69
11	·953	13·43
11	·972	13·51
11	·988	13·29
	194	
10	·011	9·27
10	·034	9·19
10	·056	8·95
10	·091	9·42
10	·138	9·23
10	·194	9·71
5	·253	7·96
5	·281	2·60
10	·315	— 1·42
10	·350	— 1·50

n	phase	brightness
	P	st
10	·390	— 1·10
10	·418	·85
10	·453	1·55
10	·479	2·94
10	·506	3·61
10	·536	4·87
10	·554	5·24
10	·585	5·44
10	·612	5·92
10	·642	7·53
10	·668	7·14
10	·694	7·73
10	·723	7·82
10	·756	8·47
10	·785	8·41
10	·818	8·74
10	·848	9·11
10	·869	10·01
10	·898	9·42
10	·925	9·51
9	·962	9·91
9	·992	9·49
	195	
10	·014	9·24
10	·042	6·75
10	·066	4·68
10	·095	2·72
10	·128	3·90
10	·169	3·04
10	·203	4·76
10	·231	5·74
10	·264	6·24
10	·304	7·39
10	·345	7·79
10	·383	8·79
10	·429	9·00
10	·475	9·06
10	·516	9·47
10	·553	9·72
10	·594	9·71
10	·642	9·75
10	·681	9·71
10	·725	10·05
10	·769	9·97
9	·807	9·34
9	·844	9·73
9	·884	9·47
9	·930	9·72
9	·973	9·94
	196	
10	·011	8·42
10	·053	8·49
10	·095	7·97
10	·133	5·42
10	·155	7·37
10	·179	2·71
10	·214	3·46
10	·248	1·13
10	·276	2·03
10	·310	1·13
10	·344	1·28
10	·375	1·30
10	·405	3·26

n	phase	brightness
	P	st
10	·432	2·14
10	·462	3·82
10	·497	5·78
10	·543	6·08
10	·600	6·11
10	·670	7·37
10	·721	7·62
10	·753	8·04
10	·784	8·51
10	·813	9·25
10	·854	8·98
10	·890	8·45
10	·921	8·70
9	·948	9·01
9	·982	8·31
	198	
10	·008	6·20
10	·031	7·29
10	·059	8·47
10	·095	8·61
10	·141	9·63
10	·172	9·40
10	·196	9·65
10	·220	10·30
10	·243	9·83
10	·265	10·81
10	·288	10·81
10	·316	12·02
10	·352	12·11
10	·397	11·76
10	·448	12·96
10	·492	13·16
10	·524	12·69
10	·549	12·99
10	·577	12·71
10	·610	13·80
10	·636	13·84
10	·667	13·86
10	·696	13·41
10	·725	14·31
10	·752	14·52
10	·776	13·36
10	·803	12·42
10	·838	8·97
10	·873	7·20
10	·900	6·07
11	·921	6·45
11	·951	6·47
11	·980	5·99
	199	
10	·013	9·11
10	·038	9·74
10	·062	9·38
10	·091	10·88
10	·135	10·66
10	·189	12·59
10	·233	12·65
10	·264	13·42
10	·297	12·72
10	·335	13·27
10	·389	13·51
10	·450	14·29
10	·507	14·36

n	phase	brightness
	P	st
10	·550	14·07
10	·625	13·99
10	·697	13·88
10	·761	13·80
10	·808	14·70
10	·853	13·67
9	·897	8·71
9	·926	7·04
9	·951	7·08
9	·968	7·02
9	·990	7·80
	200	
	I	
5	·084	14·10
5	·163	14·32
5	·261	14·30
5	·368	14·50
5	·441	14·08
5	·512	14·08
5	·584	12·70
5	·626	7·30
5	·660	5·68
5	·699	4·36
5	·741	8·76
5	·776	9·40
5	·817	11·30
5	·856	11·18
5	·904	12·76
5	·982	14·10
	II	
5	·012	12·82
5	·047	13·42
5	·105	13·90
5	·150	13·88
5	·177	14·90
5	·216	14·50
5	·287	14·22
5	·350	14·70
5	·373	14·02
5	·400	14·70
5	·412	14·10
5	·444	14·50
5	·467	14·16
5	·491	14·28
5	·514	14·72
5	·551	14·28
5	·584	14·28
5	·611	13·46
5	·638	10·70
5	·683	4·52
5	·712	4·46
5	·737	3·68
5	·756	6·58
5	·784	6·24
5	·806	8·10
5	·826	8·46
5	·858	10·88
6	·888	10·02
6	·913	11·95
6	·971	11·60
	III	
5	·049	13·92

n	phase	brightness
	P	st
5	·129	14·30
5	·209	14·70
5	·308	14·50
5	·372	14·90
5	·426	14·70
5	·482	15·10
5	·549	14·48
3	·610	9·97
5	·665	3·20
5	·747	6·82
6	·930	11·88
	201	
10	·019	11·33
10	·084	10·97
10	·141	8·07
10	·179	4·31
10	·216	2·21
10	·251	3·14
10	·286	4·19
10	·321	5·61
10	·347	6·57
10	·372	6·72
10	·404	7·90
10	·433	8·07
10	·470	8·74
10	·513	9·67
10	·552	9·82
10	·593	10·47
10	·620	9·56
10	·652	10·75
10	·688	10·67
10	·740	10·34
10	·776	10·16
10	·835	10·51
10	·890	10·82
10	·920	11·08
9	·953	10·92
9	·979	11·51
	202	
10	·014	8·08
10	·059	8·22
10	·099	8·97
10	·146	9·37
10	·180	10·59
10	·209	10·54
10	·241	10·45
10	·293	11·20
10	·340	12·05
10	·387	11·47
10	·445	11·18
10	·478	11·46
10	·513	10·79
10	·556	10·01
10	·596	9·58
10	·631	10·47
10	·669	10·08
10	·700	7·77
10	·723	4·39
10	·748	2·30
10	·770	2·72
10	·786	2·45
10	·806	2·95
10	·832	4·51

n	phase	brightness
	P	st
10	·864	4·65
9	·898	5·52
9	·925	6·71
9	·957	6·83
9	·984	7·18
	203	
10	·019	6·12
10	·048	1·74
10	·074	— ·46
10	·104	— 1·00
10	·139	·61
10	·177	2·15
10	·200	2·74
10	·223	4·29
10	·261	5·45
10	·288	5·95
10	·318	6·64
10	·350	6·22
10	·392	7·47
10	·436	7·15
10	·483	7·92
10	·537	9·14
10	·612	8·38
10	·685	9·36
10	·725	9·03
10	·779	8·99
10	·834	8·65
11	·881	9·05
11	·924	9·33
11	973	9·07
	204	
10	·008	11·71
10	·040	10·91
10	·065	11·79
10	·098	12·07
10	·125	12·25
10	·163	12·45
10	·217	12·65
10	·269	13·47
10	·349	12·95
10	·454	13·04
10	·518	12·94
10	·555	12·38
10	·593	10·43
10	·618	8·81
10	·634	7·83
10	·658	6·00
10	·676	5·01
10	·698	5·08
10	·722	4·63
10	·750	4·07
10	·774	6·19
10	·795	6·04
10	·821	7·15
10	·855	7·86
10	·892	7·92
10	·926	9·22
10	·949	10·46
11	·976	9·85
	205	
10	·020	14·46
10	·083	14·30

TABLE 6 (*continued*).

n	phase	brightness
	P	st
10	·148	15·11
10	·206	14·85
10	·252	13·52
10	·288	9·87
10	·324	6·96
10	·360	5·72
10	·390	7·09
10	·420	7·72
10	·456	9·25
10	·488	9·25
10	·512	9·70
10	·540	10·29
10	·579	11·80
10	·610	11·87
10	·638	11·89
10	·670	12·60
10	·696	14·01
9	·717	13·21
9	·758	14·13
9	·818	13·96
9	·876	14·94
9	·942	14·07
	206	
10	·029	6·20
10	·069	6·16
10	·120	6·42
10	·154	6·92
10	·182	6·45
10	·207	6·49
10	·229	5·98
10	·250	6·13
10	·279	6·78
10	·299	6·31
10	·323	6·04
10	·350	6·27
10	·375	6·11
10	·407	5·97
10	·474	6·05
10	·508	6·19
10	·533	5·96
10	·566	6·30
10	·610	5·97
10	·648	6·35
11	·683	6·35
3	·701	7·88
3	·719	11·30
3	·729	10·63
3	·738	11·43
3	·742	11·63
3	·751	11·87
3	·761	10·37
3	·771	8·60
3	·778	10·17
10	·790	6·51
10	·805	6·45
10	·832	6·88
10	·852	6·50
10	·880	6·80
9	·911	6·60
9	·945	5·97
9	·971	5·89
	207	
10	·025	14·40

n	phase	brightness
	P	st
10	·075	14·00
10	·115	14·16
10	·156	14·42
10	·215	13·90
10	·259	14·36
10	·282	14·16
10	·321	14·18
10	·362	14·68
10	·397	14·12
10	·429	11·71
5	·454	9·90
5	·466	5·88
10	·494	4·83
10	·527	5·00
10	·560	5·81
10	·589	8·01
10	·615	7·97
10	·648	10·09
10	·683	10·34
10	·726	11·57
10	·764	12·24
10	·795	11·42
10	·832	12·61
10	·863	12·74
11	·912	13.61
11	·966	13·45
	208	
10	·019	9·19
10	·049	9·34
10	·086	9·17
10	·140	10·49
10	·176	10·28
10	·204	10·60
10	·228	9·96
10	·260	10·49
10	·301	10·02
10	·320	10·63
10	·354	11·09
10	·385	10·16
10	·421	11·00
10	·465	10·98
10	·530	11·09
10	·610	10·89
10	·650	9·54
10	·687	7·12
10	·723	3·04
10	·756	1·78
10	·800	3·11
10	·834	4·58
10	·870	4·76
9	·902	5·59
9	·929	6·57
9	·954	7·07
9	·985	8·07
	209	
10	·016	13·04
10	·059	13·12
10	·116	13·66
10	·158	14·22
10	·193	13·45
8	·232	13·16
8	·271	9·29
10	·307	3·67

n	phase	brightness
	P	st
10	·342	3·63
10	·368	5·27
10	·393	5·57
10	·424	7·41
10	·464	7·99
10	·503	9·15
10	·538	9·01
10	·571	10·64
10	·610	10·30
10	·649	11·77
10	·688	11·59
10	·729	12·31
10	·761	12·71
10	·794	12·97
10	·828	12·90
10	·857	12·67
10	·886	13·05
11	·923	13·03
11	·971	13·58
	210	
10	·015	3·85
10	·047	4·58
10	·082	6·26
10	·113	7·25
10	·154	8·42
10	·204	9·32
10	·252	10·60
10	·292	11·09
10	·322	11·41
10	·342	12·07
10	·366	11·64
10	·395	11·79
10	·432	12·15
10	·465	12·46
19	·513	12·40
10	·577	13·09
10	·615	12·97
10	·647	12·54
10	·685	12·74
10	·732	12·74
10	·767	13·88
10	·795	14·31
10	·831	13·52
9	·864	12·38
5	·895	5·86
5	·913	4·46
10	·936	2·72
10	·955	1·18
10	·987	2·45
	211	
10	·023	7·93
10	·062	7·84
10	·102	7·48
10	·135	7·20
10	·165	7·11
10	·200	6·20
10	·233	6·81
10	·255	7·23
10	·295	5·94
10	·337	5·80
10	·367	5·98
10	·392	6·19
10	·440	6·22

n	phase	brightness
	P	st
10	·463	6·32
10	·492	5·97
10	·532	6·93
10	·559	7·23
10	·606	6·57
10	·655	7·44
10	·694	8·07
10	·731	8·73
10	·768	8·76
10	·807	9·37
10	·843	9·38
10	·878	9·56
9	·917	9·23
9	·939	9·88
9	·975	9·30
	212	
10	·014	10·06
10	·046	10·35
10	·079	9·91
10	·110	10·36
10	·154	10·48
10	·188	10·58
10	·225	11·05
10	·274	10·48
10	·304	9·55
10	·330	10·47
10	·361	10·63
10	·398	10·68
10	·425	10·79
10	·474	10·63
10	·519	10·58
10	·560	9·73
10	·602	5·92
10	·643	4·02
10	·685	5·03
10	·720	5·82
10	·773	6·70
10	·831	7·74
10	·874	7·77
10	·909	8·08
11	·951	9·63
11	·984	9·67
	213	
10	·028	8·32
10	·056	7·97
10	·085	7·96
10	·127	7·83
10	·163	8·38
10	·198	7·60
10	·246	8·05
10	·295	7·74
10	·329	8·30
10	·365	7·99
10	·408	7·24
10	·447	6·17
10	·473	3·73
10	·499	2·69
10	·530	1·65
10	·562	1·76
10	·590	3·16
10	·620	3·81
10	·659	4·39
10	·712	4·49

n	phase	brightness
	P	st
10	·746	5·94
10	·785	6·38
11	·832	6·92
11	·884	7·43
11	·936	7·67
11	·983	7·70
	214	
10	·020	7·41
10	·056	7·87
10	·086	7·90
10	·107	7·49
10	·137	7·82
10	·165	8·00
10	·190	8·13
10	·225	7·96
10	·273	7·69
10	·308	7·82
10	·344	7·42
10	·372	8·20
10	·410	7·26
10	·447	7·42
10	·477	6·58
10	·509	4·47
10	·540	3·21
10	·569	2·55
10	·603	3·30
10	·631	1·86
10	·658	4·76
10	·689	3·60
10	·716	4·97
10	·744	5·78
10	·772	6·62
10	·803	5·66
10	·839	7·32
10	·878	6·77
10	·933	7·49
9	·975	7·67
	215	
10	·015	9·19
10	·045	8·99
10	·077	9·95
10	·110	11·19
10	·145	10·52
10	·201	11·96
10	·246	12·59
10	·270	12·79
10	·299	12·13
10	·328	13·49
10	·357	13·27
10	·385	13·30
10	·414	13·91
10	·444	14·08
10	·481	13·81
10	·512	13·79
10	·543	13·57
10	·580	14·32
10	·614	14·27
10	·644	14·01
10	·673	14·71
10	·711	14·66
10	·744	14·92
10	·787	12·26
10	·828	9·81

n	phase	brightness
	P	st
10	·866	7·85
10	·897	7·59
10	·919	7·39
11	·942	7·32
11	·958	8·29
11	·985	8·15
	216	
10	·033	12·36
10	·086	12·87
10	·124	12·97
12	·151	13·71
10	·182	13·20
10	·209	12·58
10	·239	8·66
10	·268	2·85
10	·283	— ·86
10	·309	—1·50
10	·331	— ·94
10	·362	— ·92
10	·382	·80
10	·403	·96
10	·418	1·99
10	·445	3·50
10	·471	4·76
10	·496	5·78
10	·517	6·43
10	·541	7·13
10	·565	8·29
10	·595	8·12
10	·615	8·71
10	·650	9·19
10	·675	8·76
10	·704	11·22
10	·726	10·86
10	·765	12·20
10	·808	11·76
10	·845	12·26
11	·874	11·97
11	·916	12·30
11	·946	12·43
11	·979	13·09
	217	
10	·012	11·90
10	·040	12·11
10	·070	11·78
10	·107	12·37
10	·158	11·38
10	·220	11·67
10	·259	12·75
10	·321	12·84
10	·360	11·94
10	·389	12·75
10	·417	12·48
10	·443	11·35
10	·472	9·13
10	·506	7·37
10	·546	5·38
10	·573	3·85
10	·598	4·62
10	·632	5·17
10	·656	6·35
10	·676	6·26
10	·698	6·47

n	phase	brightness
	P	st
10	·727	6·54
10	·750	7·79
10	·769	7·73
10	·791	7·93
10	·816	8·96
10	·851	9·56
10	·894	10·79
9	·923	9·43
9	·955	11·13
9	·984	11·83
	218	
10	·017	9·22
10	·054	9·34
10	·082	9·60
10	·114	9·80
10	·140	9·90
10	·178	9·52
10	·214	9·42
10	·278	9·60
10	·324	9·80
10	·364	10·00
10	·400	10·00
10	·428	10·30
10	·459	10·00
10	·488	9·62
10	·524	7·30
5	·554	4·98
5	·566	2·08
10	·581	·87
10	·610	1·17
10	·635	2·16
10	·669	3·87
10	·698	5·06
10	·739	5·48
10	·781	7·14
10	·810	7·35
10	·848	7·84
10	·871	7·97
10	·900	8·17
10	·927	8·66
11	·966	8·92
	219	
10	·016	10·89
10	·045	11·14
10	·075	10·92
10	·109	9·44
10	·142	5·44
10	·171	3·99
10	·197	1·58
10	·225	1·88
10	·254	1·75
10	·291	3·74
10	·329	5·56
10	·367	5·73
10	·399	6·38
10	·440	7·29
10	·480	7·80
10	·516	8·08
10	·549	8·81
10	·584	9·24
10	·629	9·69
10	·667	10·25

n	phase	brightness
	P	st
10	·710	9·93
10	·750	9·88
10	·794	9·89
10	·832	10·81
10	·875	9·98
9	·914	9·98
9	·945	10·40
9	·973	10·33
	220	
10	·020	10·00
10	·061	10·00
10	·106	11·10
10	·156	9·41
10	·202	6·73
10	·229	4·07
10	·269	2·72
10	·317	5·76
10	·366	6·38
10	·405	7·92
10	·441	8·30
10	·471	8·40
10	·503	8·63
10	·550	8·89
10	·613	9·60
10	·653	9·30
10	·696	9·90
10	·747	9·90
10	·787	10·20
11	·835	9·67
11	·878	9·86
11	·923	9·95
11	·973	9·95
	221	
10	·020	13·42
10	·053	13·00
10	·089	13·39
10	·123	13·84
10	·158	13·55
10	·198	14·13
10	·237	13·20
10	·265	11·52
10	·300	5·50
10	·328	3·66
10	·361	2·70
10	·382	1·62
10	·415	3·21
10	·452	5·05
10	·481	6·63
10	·515	7·30
10	·541	9·16
10	·571	9·04
10	·627	11·34
10	·672	11·27
10	·719	12·07
10	·768	11·68
10	·812	12·65
10	·848	13·28
11	·878	13·24
11	·905	13·33
11	·942	13·39
11	·987	13·25

TABLE 6 (*continued*).

n	phase	brightness
222		
I		
	P	st
5	·054	12·68
5	·113	14·00
5	·181	13·28
5	·234	13·50
5	·306	14·04
5	·412	13·56
5	·462	11·64
5	·505	7·66
5	·598	4·28
5	·685	6·10
5	·734	8·52
5	·787	8·92
5	·876,	9·70
5	·948	11·84
II + III		
10	·021	13·43
10	·076	12·87
10	·138	13·08
10	·182	13·28
10	·221	13·79
10	·262	13·10
10	·302	13·50
10	·366	14·07
10	·424	11·08
10	·476	5·33
10	·514	3·11
10	·554	3·52
10	·597	5·22
10	·648	5·34
10	·687	7·14
10	·736	7·79
10	·786	10·16
11	·833	11·24
11	·874	11·46
11	·922	11·86
11	·973	12·46
223		
10	·016	11·49
10	·042	11·30
10	·076	11·50
10	·107	11·42
10	·130	10·63
10	·153	10·90
10	·187	11·41
10	·224	11·11
10	·268	10·78
10	·309	11·70
10	·354	11·64
10	·392	11·12
9	·422	9·11
10	·454	3·10
10	·487	·18
10	·516	·75
10	·550	1·92
10	·575	3·23
10	·610	3·97
10	·651	6·12
10	·687	7·70
10	·730	8·85
10	·763	8·93

n	phase	brightness
	P	st
10	·793	9·40
10	·819	9·89
10	·843	10·14
11	·875	10·86
11	·912	11·19
11	·949	11·18
11	·985	11·64
224		
10	·013	5·29
10	·044	5·77
10	·086	6·91
10	·131	8·26
10	·178	10·79
10	·209	10·67
10	·233	11·15
10	·262	12·04
10	·285	12·14
10	·322	13·12
10	·360	12·42
10	·384	13·03
10	·418	12·98
10	·444	13·19
10	·465	13·12
10	·482	13·22
10	·513	12·73
10	·539	12·93
10	·575	13·01
10	·608	13·23
10	·634	13·24
10	·657	12·84
10	·681	13·40
10	·698	13·76
10	·722	13·62
10	·741	13·47
10	·761	13·11
10	·780	10·83
5	·794	9·48
5	·802	5·60
10	·818	3·19
10	·842	·92
10	·863	1·10
10	·892	·60
10	·922	1·73
10	·952	2·54
10	·970	3·73
9	·988	4·49
231		
10	·034	8·31
10	·096	8·56
10	·160	9·22
10	·224	10·30
10	·282	10·70
10	·350	10·10
10	·412	10·60
10	·443	10·30
10	·478	10·50
10	·504	10·90
10	·531	11·30
10	·563	11·30
10	·596	11·20
10	·660	11·20
10	·716	11·10
10	·773	10·90

n	phase	brightness
	P	st
11	·836	7·64
11	·884	4·97
11	·932	5·48
11	·977	7·10
232		
9	·033	6·98
4	·054	8·00
2	·077	19·70
1	·080	22·70
2	·082	24·55
4	·086	25·45
3	·095	26·53
4	·100	25·52
1	·104	24·40
1	·112	21·40
3	·114	19·03
2	·120	18·00
2	·128	12·30
10	·151	6·84
10	·176	7·31
10	·190	6·89
10	·224	7·03
10	·259	6·94
10	·311	6·80
10	·366	7·13
10	·390	6·97
10	·405	7·13
10	·432	6·99
10	·468	7·10
10	·483	7·03
10	·494	7·28
10	·514	7·44
10	·552	7·17
10	·567	6·94
10	·582	6·79
10	·609	7·70
10	·637	7·17
10	·658	6·84
10	·676	6·96
10	·705	7·25
10	·735	6·16
10	·748	6·96
10	·761	6·71
10	·777	6·88
10	·817	7·15
10	·842	6·98
10	·861	6·97
10	·871	6·96
10	·884	6·83
10	·907	7·41
10	·943	7·15
9	·996	7·11
235		
10	·008	4·32
10	·036	5·53
10	·069	5·74
10	·099	8·33
10	·134	8·46
10	·170	8·89
10	·212	9·02
10	·247	9·29
10	·279	9·94
10	·320	9·72

n	phase	brightness
	P	st
10	·370	10·98
10	·414	10·77
10	·459	10·60
10	·504	11·10
10	·544	11·06
10	·589	11·40
10	·636	11·22
10	·672	11·14
10	·704	11·49
10	·729	11·67
10	·751	11·62
10	·778	11·01
10	·811	10·44
5	·857	4·90
5	·895	2·98
11	·923	3·00
11	·959	3·82
11	·986	4·17
236		
10	·035	11·10
10	·100	11·10
10	·145	10·90
10	·208	10·70
10	·280	10·80
10	·327	9·81
10	·360	8·62
10	·401	5·07
10	·442	5·07
10	·479	6·32
10	·531	7·46
10	·573	8·22
10	·618	9·42
10	·673	9·91
10	·724	9·88
10	·778	10·20
10	·822	10·41
11	·870	10·58
11	·952	10·95
237		
10	·015	13·71
10	·040	13·90
10	·058	13·81
10	·075	13·91
10	·091	13·91
10	·106	14·03
10	·123	13·83
10	·140	13·62
10	·156	14·20
10	·176	13·87
10	·191	13.85
10	·210	13·93
10	·229	13·82
10	·246	14·30
10	·269	14·20
10	·297	14·03
10	·314	13·90
10	·330	12·10
10	·346	9·83
10	·360	7·49
10	·373	5·73
10	·384	4·92
10	·409	4·21
10	·427	4·19

n	phase	brightness
	P	st
10	·451	4·76
10	·472	5·22
10	·496	6·15
10	·513	6·64
10	·542	7·75
10	·559	8·14
10	·574	8·86
10	·594	8·96
10	·608	9·42
10	·634	10·54
10	·653	10·48
10	·671	10·69
10	·695	11·80
10	·710	11·19
10	·733	11·27
10	·750	12·12
10	·764	12·90
10	·784	12·20
10	·800	12·87
10	·819	13·70
11	·845	13·50
10	·879	13·90
10	·910	13·66
10	·930	13·81
10	·951	13·78
10	·971	13·73
11	·988	13·85
238		
10	·023	8·54
10	·065	9·65
10	·114	9·07
10	·156	10·42
10	·190	9·26
10	·220	8·92
10	·250	10·15
10	·304	9·90
10	·355	10·10
10	·404	10·20
10	·465	10·11
10	·513	10·55
10	·557	10·30
10	·612	6·31
10	·665	3·01
10	·709	3·03
10	·741	3·75
10	·767	4·38
10	·809	4·85
10	·855	5·51
10	·894	7·02
10	·931	7·87
10	·977	8·41
239		
10	·008	12·85
10	·037	13·53
10	·062	14·27
10	·080	13·19
10	·099	13·54
10	·122	12·97
10	·150	10·40
10	·190	7·06
10	·231	3·67
10	·260	3·33
10	·282	3·41

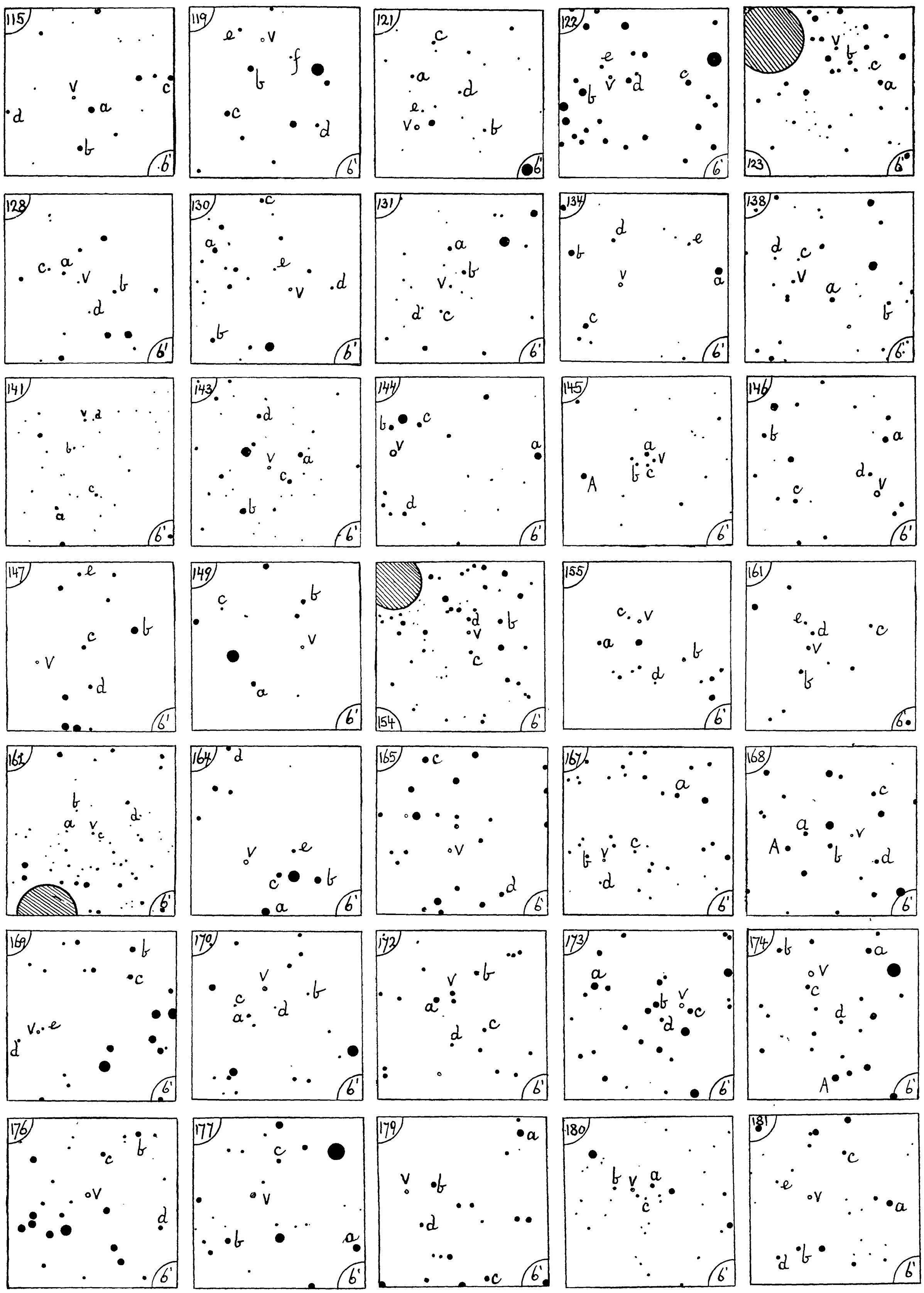
n	phase	brightness
	P	st
10	·306	4·65
10	·343	6·31
10	·380	7·01
10	·401	6·72
10	.424	8·18
10	·476	8·87
10	·531	9·69
10	·585	10·63
10	·620	10·49
10	·646	11·07
10	·669	11·56
10	·709	10·94
10	·739	12·95
10	·769	12·36
10	·794	12·39
10	·817	12·58
10	·862	12·46
10	·920	12·62
11	·952	12·54
11	·978	13·28
240		
8	·009	12·65
5	·049	7·50
5	·059	5·78
10	·096	3·64
10	·142	4·23
10	·181	5·39
10	·217	8·81
10	·250	7·95
10	·305	10·29
10	·365	10·96
10	·406	11·71
10	·445	12·43
10	·480	12·66
10	·508	12·48
10	·533	13·01
10	·556	13·28
10	·590	13·41
10	·628	13·19
10	·666	13·80
10	·702	13·80
10	·730	13·20
10	·758	13·71
10	·788	13·61
10	·831	13·39
10	·875	13·59
10	·917	12·97
10	·962	13·20
242		
5	·026	2·70
5	·085	2·64
5	·129	1·52
5	·149	1·78
5	·174	2·76
5	·232	1·92
5	·302	2·46
5	·358	2·02
5	·418	2·24
5	·458	3·10
5	·528	3·84
5	·559	3·64
5	·603	4·74
5	·627	4·88

n	phase	brightness
	P	st
5	·684	7·16
5	·726	6·42
5	·769	6·22
5	·852	5·12
5	·889	5·04
5	·927	3·74
5	·958	3·12
6	·982	3·37
4	·991	3·65
5	·035	2·36
5	·064	2·32
5	·088	2·72
5	·116	·82
5	·129	1·82
5	·158	1·68
5	·199	2·36
5	·229	2·14
5	·267	2·50
5	·290	2·24
5	·314	2·04
5	·377	3·56
5	·429	2·68
5	·464	2·22
5	·506	4·40
5	·543	4·38
5	·588	6·24
5	·629	6·48
5	·665	7·14
5	·708	7·40
5	·739	8·28
5	·791	7·98
5	·814	6·98
5	·850	5·44
5	·905	4·70
5	·943	4·34
5	·975	4·16
245		
10	·022	12·24
10	·067	9·63
10	·108	6·74
10	·139	5·36
10	·174	5·48
10	·203	5·61
10	·236	5·86
10	·267	6·73
10	·298	7·24
10	·331	7·85
10	·362	8·59
10	·390	8·51
10	·420	9·05
10	·451	10·09
10	·505	10·38
10	·566	11·50
10	·623	11·33
10	·658	11·23
10	·694	12·12
10	·725	11·79
10	·750	11·95
10	·783	11·94
10	·817	12·74
10	·846	12·64
11	·878	12·41
11	·918	12·42
11	·963	13·07

n	phase	brightness
246		
	P	st
10	·010	4·10
10	·024	4·73
10	·050	4·14
10	·080	4·63
10	·118	4·02
10	·145	4·58
10	·166	4·60
10	·201	4·66
10	·234	5·11
10	·258	4·50
10	·286	5·06
5	·310	5·14
5	·327	6·62
5	·343	9·70
5	·355	11·88
5	·368	15·52
5	·377	17·40
5	·386	19·00
5	·398	16·78
5	·405	16·18
5	·421	11·82
5	·436	7·76
5	·445	6·64
5	·460	5·68
5	·471	4·56
10	·484	4·73
10	·498	4·90
10	·530	4·11
10	·564	4·50
10	·608	4·34
9	·636	4·09
10	·657	4·50
10	·676	4·54
10	·693	4·41
10	·714	4·31
10	·741	4·38
10	·773	4·71
10	·804	4·58
10	·849	3·97
10	·891	5·27
10	·917	4·98
10	·948	4·90
10	·970	5·04
9	·988	4·56
10	·020	9·03
10	·051	9·50
10	·087	9·54
10	·129	9·44
10	·163	9·54
10	·195	8·98
10	·225	9·56
10	·263	9·28
10	·300	9·58
10	·332	9·44
10	·368	10·10
10	·400	10·00
10	·438	9·51
10	·481	9·54
10	·521	5·55
10	·565	2·26
10	·610	·96
10	·645	1·05
10	·690	2·72
10	·730	4·02

TABLE 6 (*continued*),

n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness
	P	st		P	st		P	st		P	st		P	st		P	m		P	st		P	st
10	·762	5·71	10	·098	8·66	10	·649	7·04	10	·916	8·60	10	·649	10·79	10	·496	·152	10	·451	1·19	10	·808	12·39
10	·794	6·86	10	·134	7·66	10	·691	6·88	11	·944	8·05	5	·690	9·08	10	·524	·120	10	·483	1·77	10	·860	12·32
11	·837	7·10	10	·177	4·36	10	·732	8·08	11	·969	8·49	5	·707	6·94	10	·541	·132	10	·513	2·05	10	·906	13·20
11	·884	8·55	10	·212	3·99	10	·759	7·94				10	·720	6·15	10	·552	·148	10	·548	2·35	10	·941	13·20
11	·936	8·54	10	·250	4·20	10	·792	8·06		273		10	·756	3·67	10	·561	·144	10	·582	2·90	9	·972	12·87
11	·980	9·12	10	·285	5·21	10	·829	8·29	10	·021	11·04	10	·789	4·67	10	·578	·120	10	·613	3·00			
			10	·326	5·07	10	·870	8·82	10	·083	11·04	10	·827	5·82	10	·606	·124	10	·654	3·77		310	
	250		10	·370	6·27	10	·901	9·64	10	·137	10·95	10	·867	7·14	10	·627	·128	10	·685	4·12			
10	·017	5·40	10	·415	7·74	10	·925	9·57	10	·206	11·43	9	·905	7·98	10	·655	·120	10	·716	4·56	10	·016	12·03
10	·068	7·24	10	·461	8·42	11	·960	10·00	10	·250	11·25	9	·937	8·36	10	·679	·136	10	·742	4·87	10	·052	12·30
10	·108	7·52	10	·509	7·96				10	·298	11·50	9	·978	9·17	10	·699	·120	10	·775	5·00	10	·093	12·80
10	·146	8·36	10	·552	8·55		272		10	·349	11·06				10	·731	·120	10	·814	5·17	10	·133	12·82
10	·187	9·38	10	·598	9·84	10	·016	8·75	10	·385	10·82		302		10	·746	·120	10	·845	4·75	10	·164	12·22
10	·236	9·40	10	·631	10·13	10	·048	9·84	10	·415	8·01			m	10	·772	·132	10	·879	5·96	10	·205	12·21
10	·281	10·08	10	·677	10·88	10	·077	9·41	10	·455	7·38	10	·033	·136	10	·791	·124	10	·918	5·99	10	·238	12·35
10	·335	10·81	10	·724	11·12	10	·107	9·92	10	·485	6·08	10	·060	·132	11	·800	·153	11	·951	6·16	10	·266	12·56
10	·369	11·23	11	·765	10·88	10	·135	9·53	10	·520	7.47	10	·104	·132	11	·810	·145	11	·984	6·64	10	·296	12·20
10	·404	11·68	11	·824	11·48	10	·156	10·22	10	·578	7·59	10	·159	·144	11	·838	·120				10	·325	12·42
10	·455	11·33	11	·879	11·03	10	·197	9·83	10	·626	9·10	10	·198	·144	11	·860	·145		309		10	·354	12·39
10	·490	11·43	11	·929	11·61	10	·245	10·41	10	·663	8·52	10	·238	·132	11	·904	·131				10	·386	12·74
10	·527	12·16	11	·976	11·40	10	·282	10·29	10	·731	10·05	10	·261	·155	11	·935	·142	10	·012	13·10	10	·421	13·17
10	·556	11·78				10	·322	10·56	10	·801	10·60	10	·272	·124	11	·990	·131	10	·052	13·01	10	·447	12·59
10	·590	11·56		268		10	·359	11·64	9	·844	10·47	10	·294	·117				10	·092	13·20	10	·479	11·70
10	·617	11·66	10	·022	10·40	10	·406	10·67	9	·883	11·26	10	·304	·124		303		10	·136	13·40	5	·504	7·75
10	·650	11·80	10	·065	10·40	10	·452	10·27	9	·938	11·42	10	·314	·120			st	10	·173	12·09	5	·517	6·28
10	·674	11·98	10	·094	9·77	10	·477	9·71	9	·981	11·36	1	·326	·470	10	·018	6·08	10	·204	13·20	10	·536	3·01
10	·713	11·75	10	·121	10·81	10	·504	9·87				2	·354	3·400	10	·042	6·47	10	·243	12·60	10	·567	·79
10	·758	11·12	10	·150	9·89	10	·547	9·48		283		2	·360	3·425	10	·066	6·12	10	·295	9·47	10	·609	1·72
10	·802	11·89	10	·198	10·48	10	·594	9·41	10	·033	10·50	2	·364	3·360	10	·097	6·10	10	·355	6·18	10	·645	3·37
10	·838	10·95	10	·238	10·66	10	·637	6·86	10	·081	10·25	2	·370	3·535	10	·126	6·16	10	·386	6·00	10	·688	4·69
10	·863	9·61	10	·273	10·70	10	·672	7·91	10	·132	10·05	2	·373	3·425	10	·149	6·69	10	·415	6·79	10	·728	5·96
10	·891	8·94	10	·317	10·89	10	·704	6·78	10	·182	10·70	2	·394	·485	10	·167	7·04	10	·447	7·05	10	·760	7·23
10	·924	5·43	10	·349	9·78	10	·736	5·81	10	·247	10·89	2	·398	·480	10	·201	6·81	10	·482	8·64	10	·782	7·94
10	·949	4·53	11	·384	8·82	10	·761	6·56	10	·324	10·90	2	·400	·340	10	·243	6·20	10	·522	8·87	10	·813	8·56
11	·981	5·66	10	·451	5·55	10	·787	6·46	10	·397	11·10	2	·404	·240	10	·277	5·15	10	·577	10·12	11	·848	8·85
			10	·514	4·49	10	·814	6·71	10	·451	10·80	10	·415	·128	10	·315	3·17	10	·637	11·12	11	·883	10·03
	255		10	·547	5·36	10	·836	7·05	10	·506	11·40	10	·427	·148	10	·353	1·38	10	·684	11·50	11	·911	10·61
10	·028	11·30	10	·581	5·81	10	·865	7·25	10	·554	11·10	10	·438	·121	10	·381	1·06	10	·725	12·14	11	·944	10·94
10	·066	10·06	10	·611	6·45	10	·895	7·32	10	·601	10·39	10	·462	·128	10	·413	·96	10	·764	12·03	11	·977	11·18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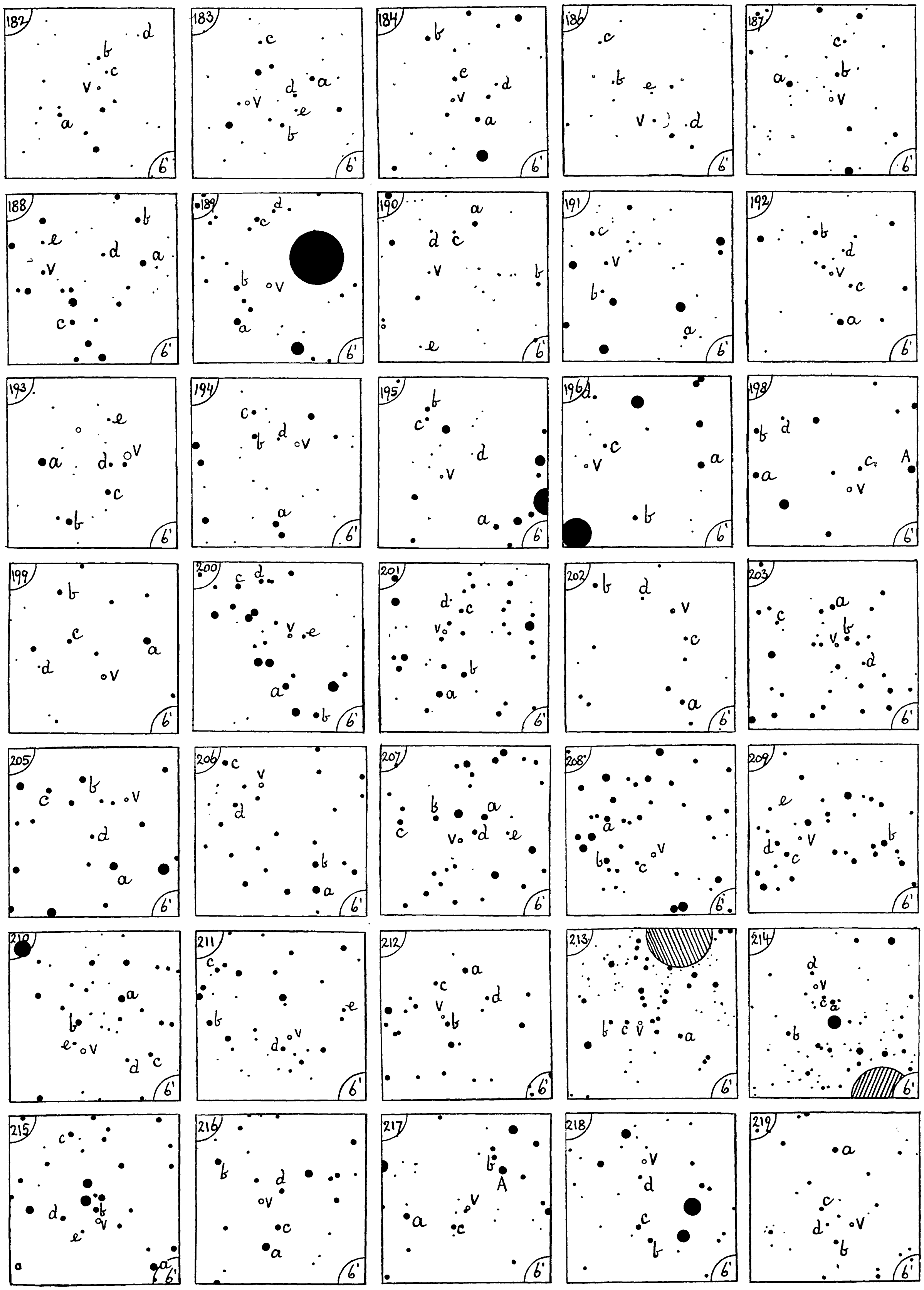
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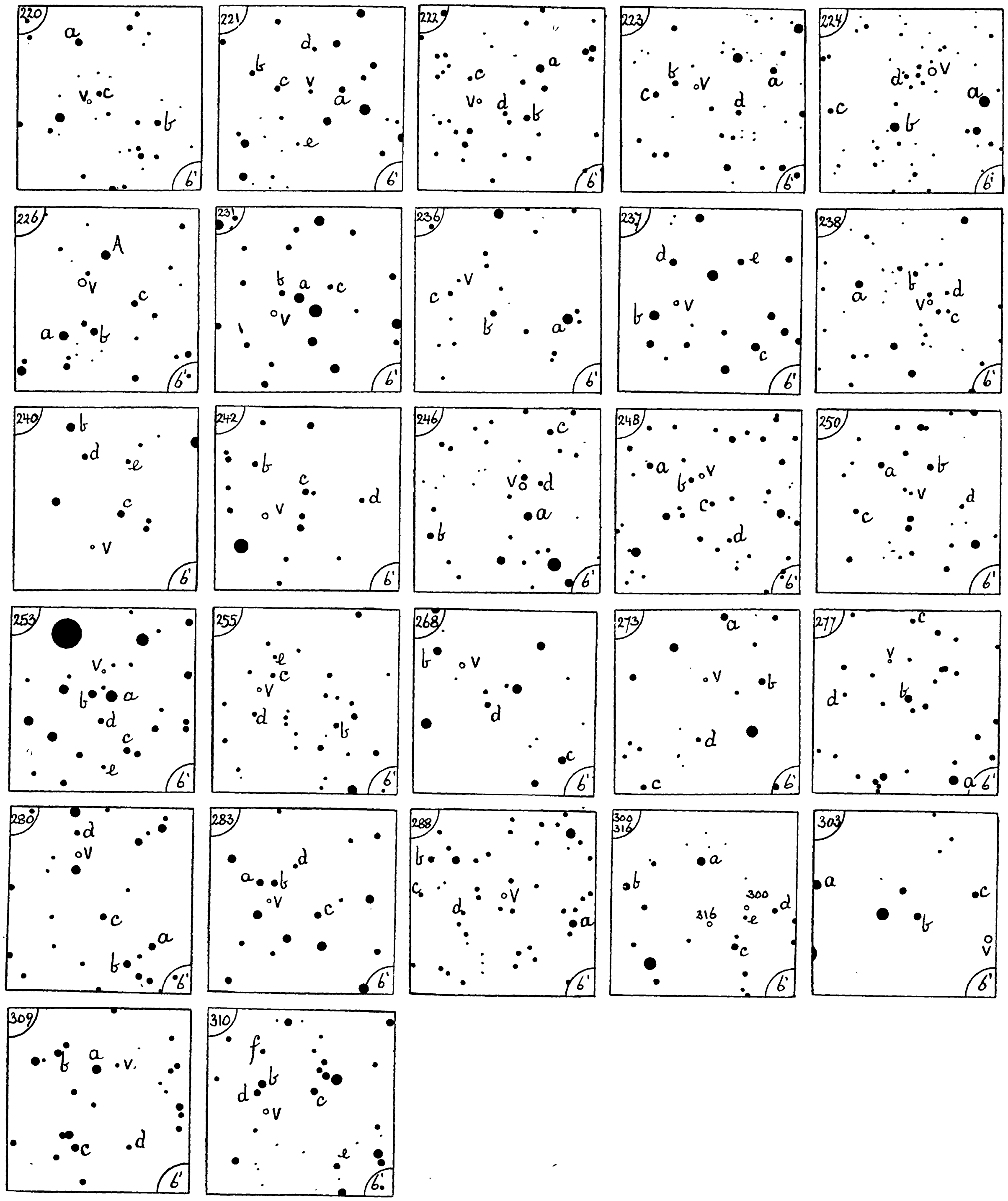
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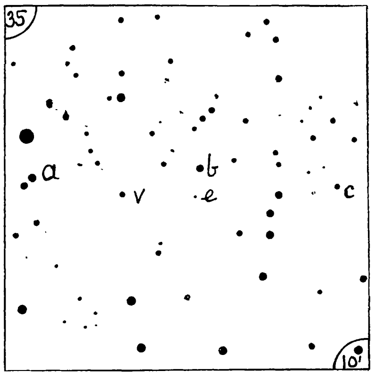
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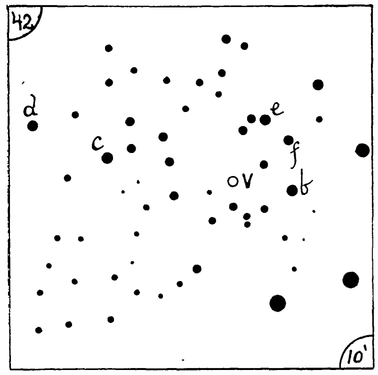
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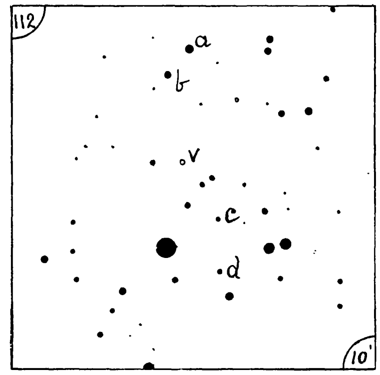
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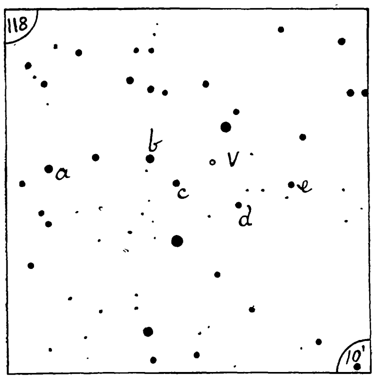
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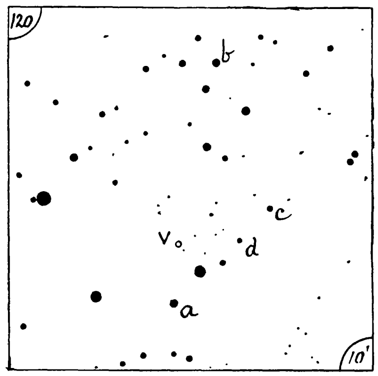
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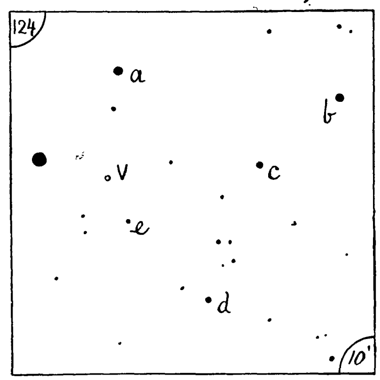
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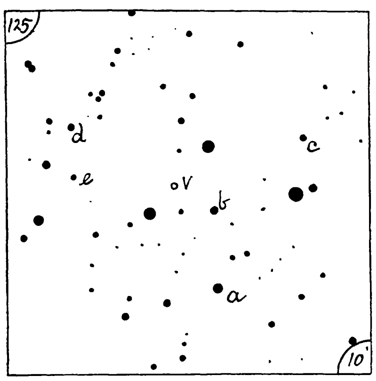
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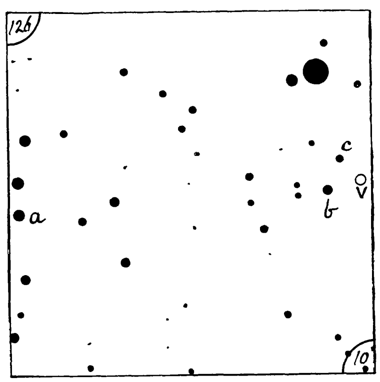
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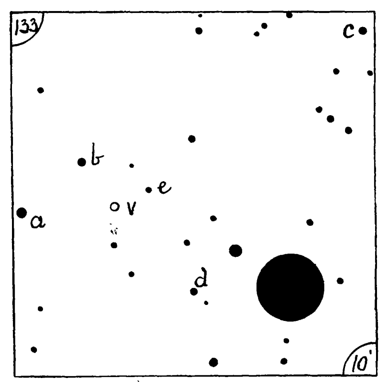
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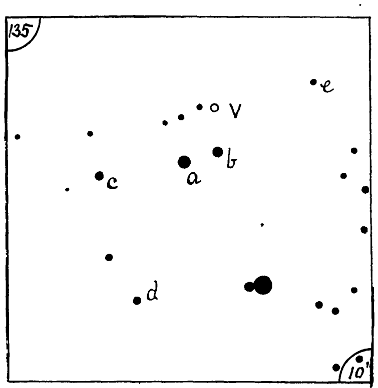
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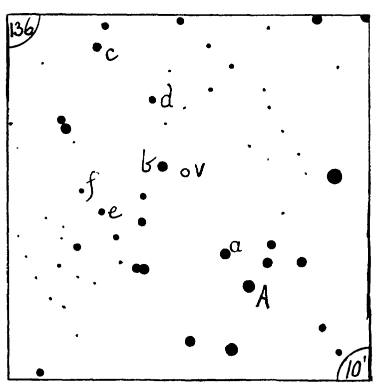
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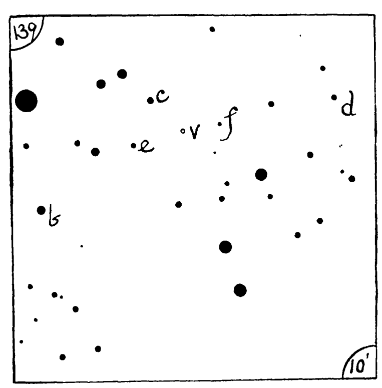
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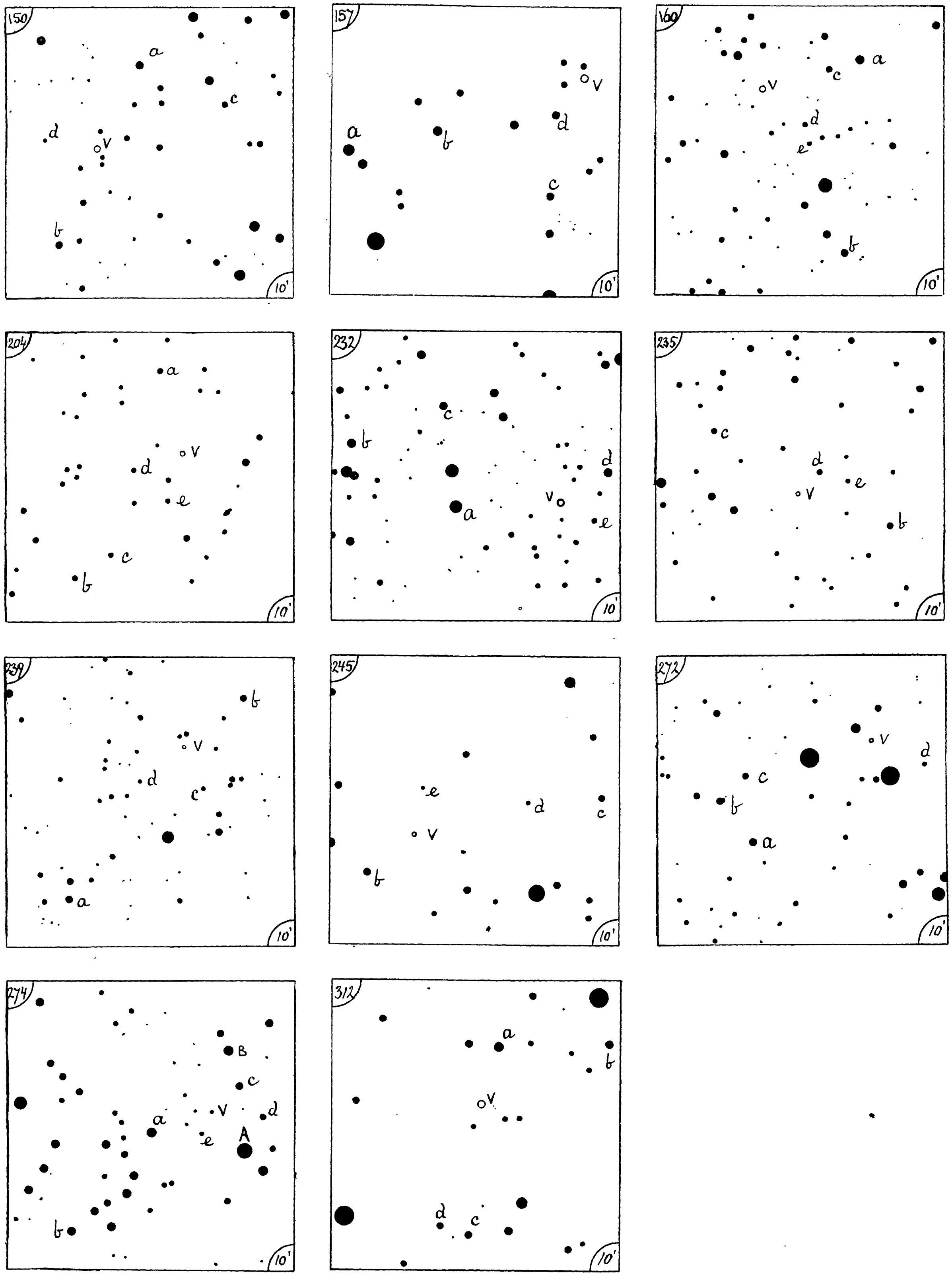
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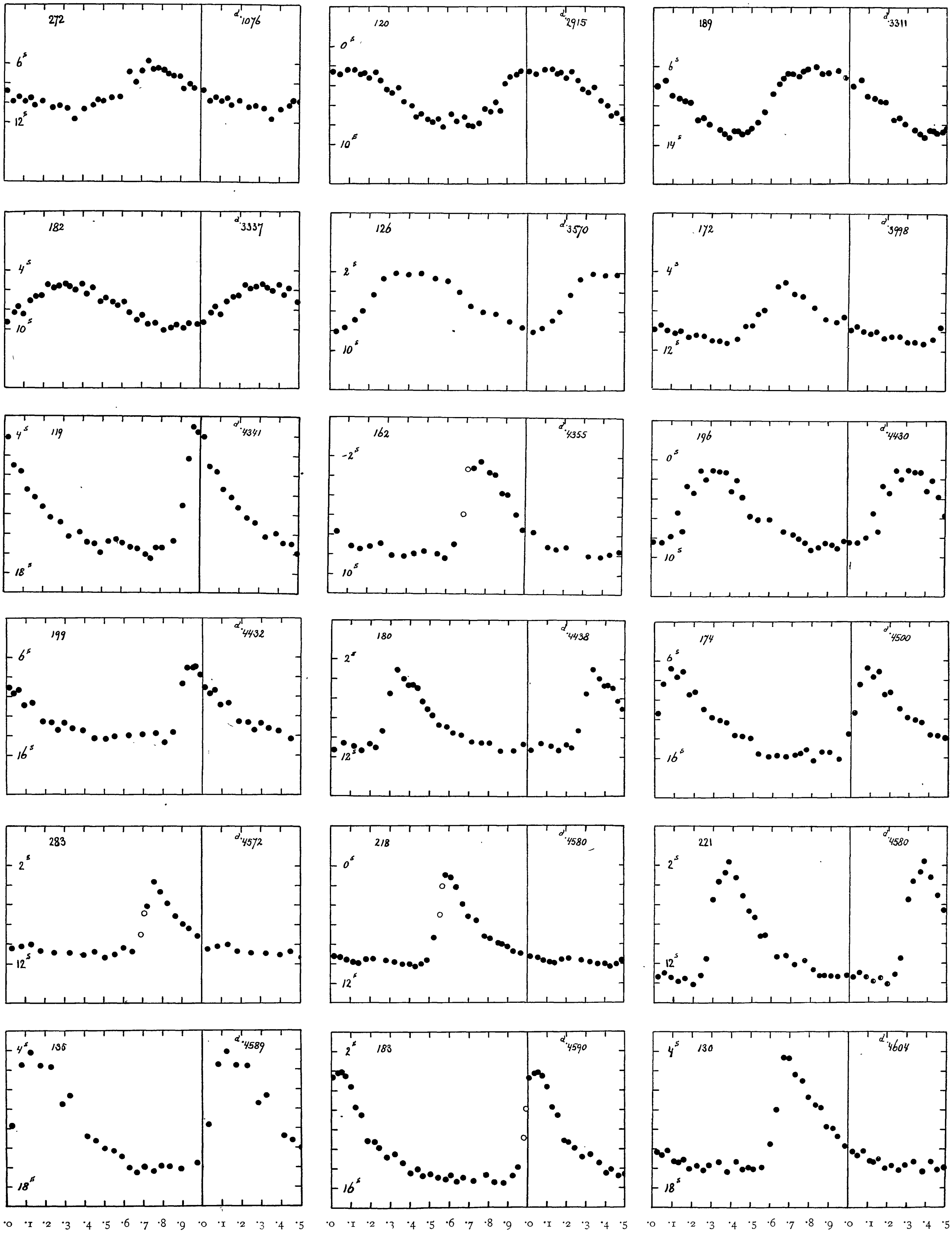
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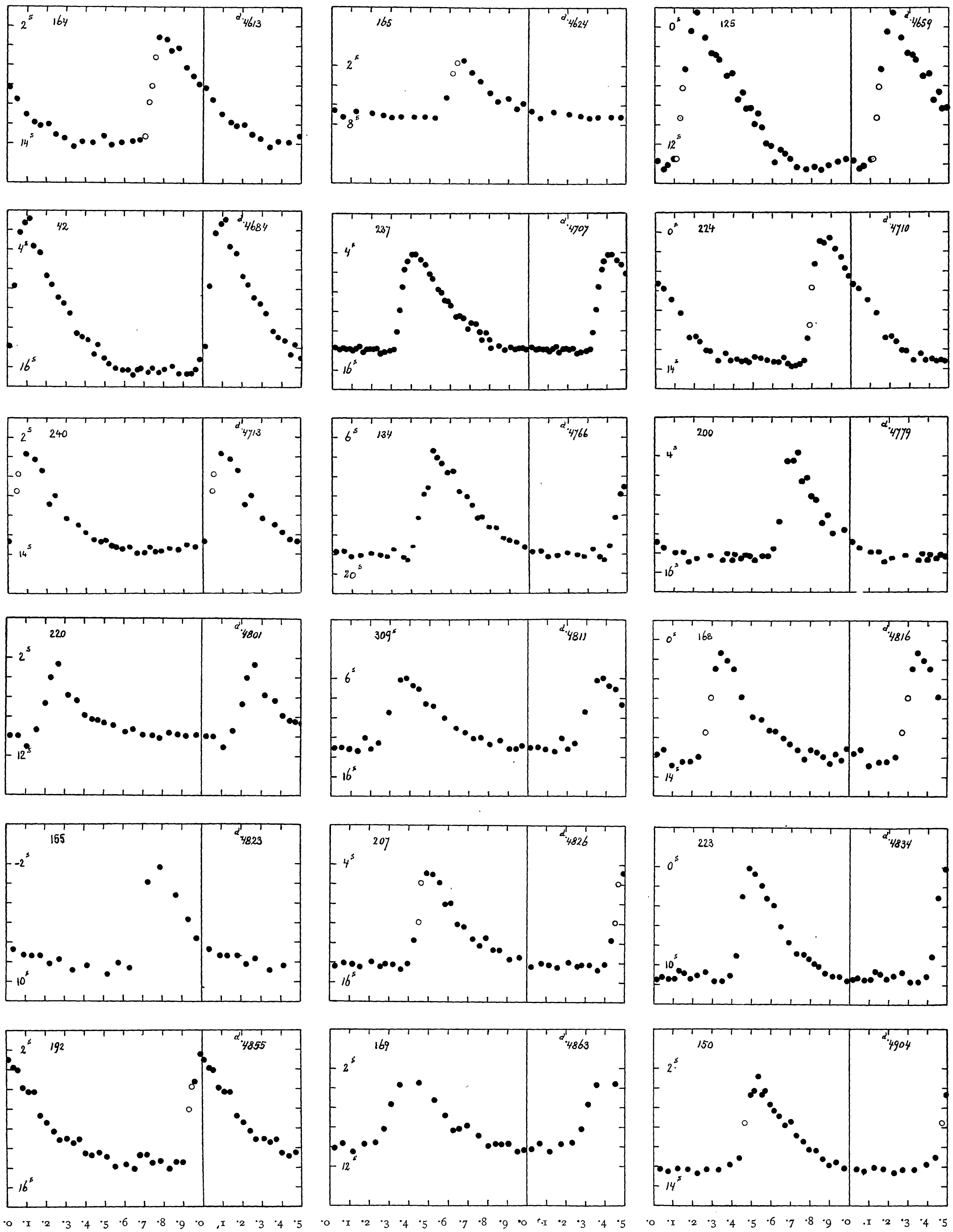
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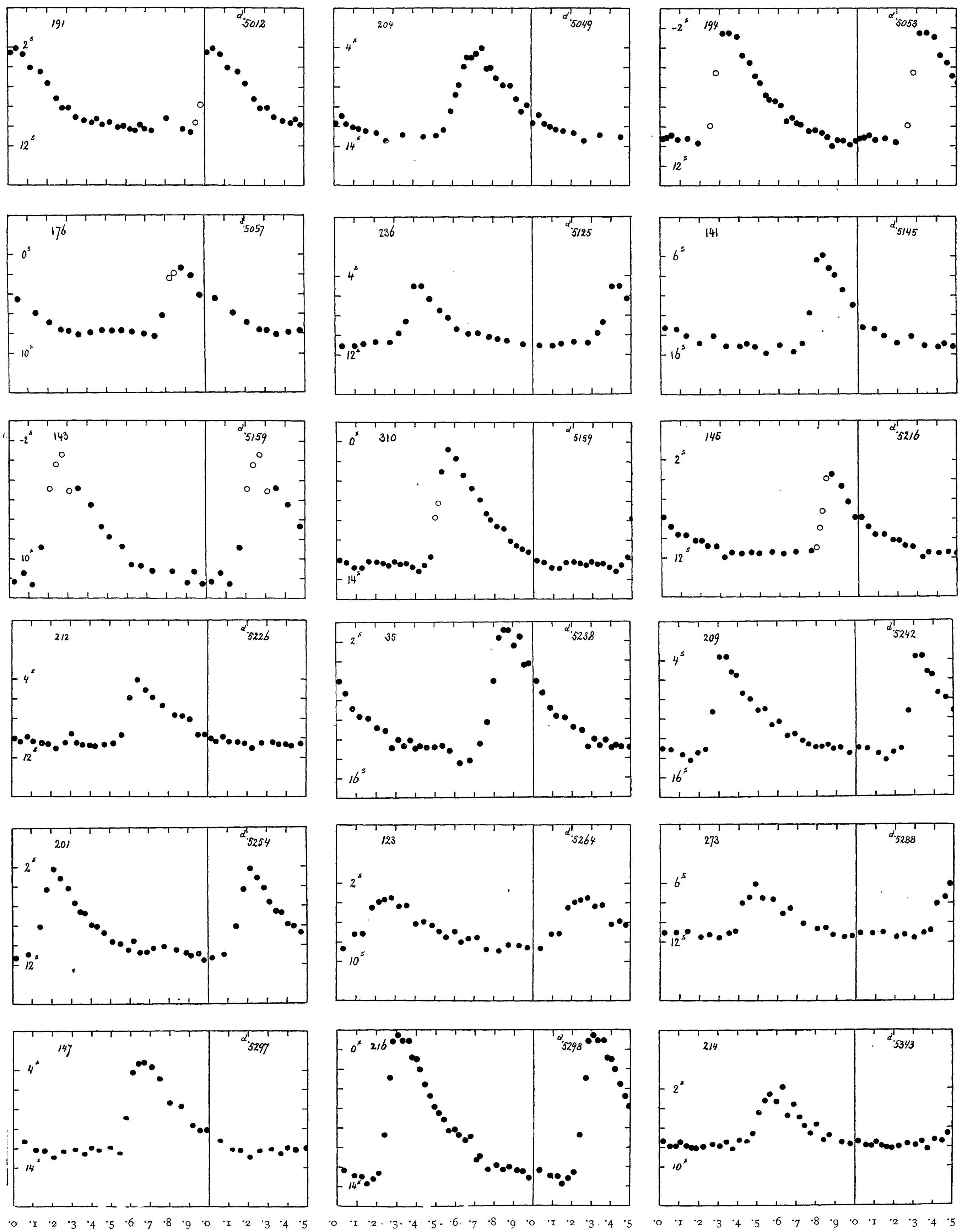
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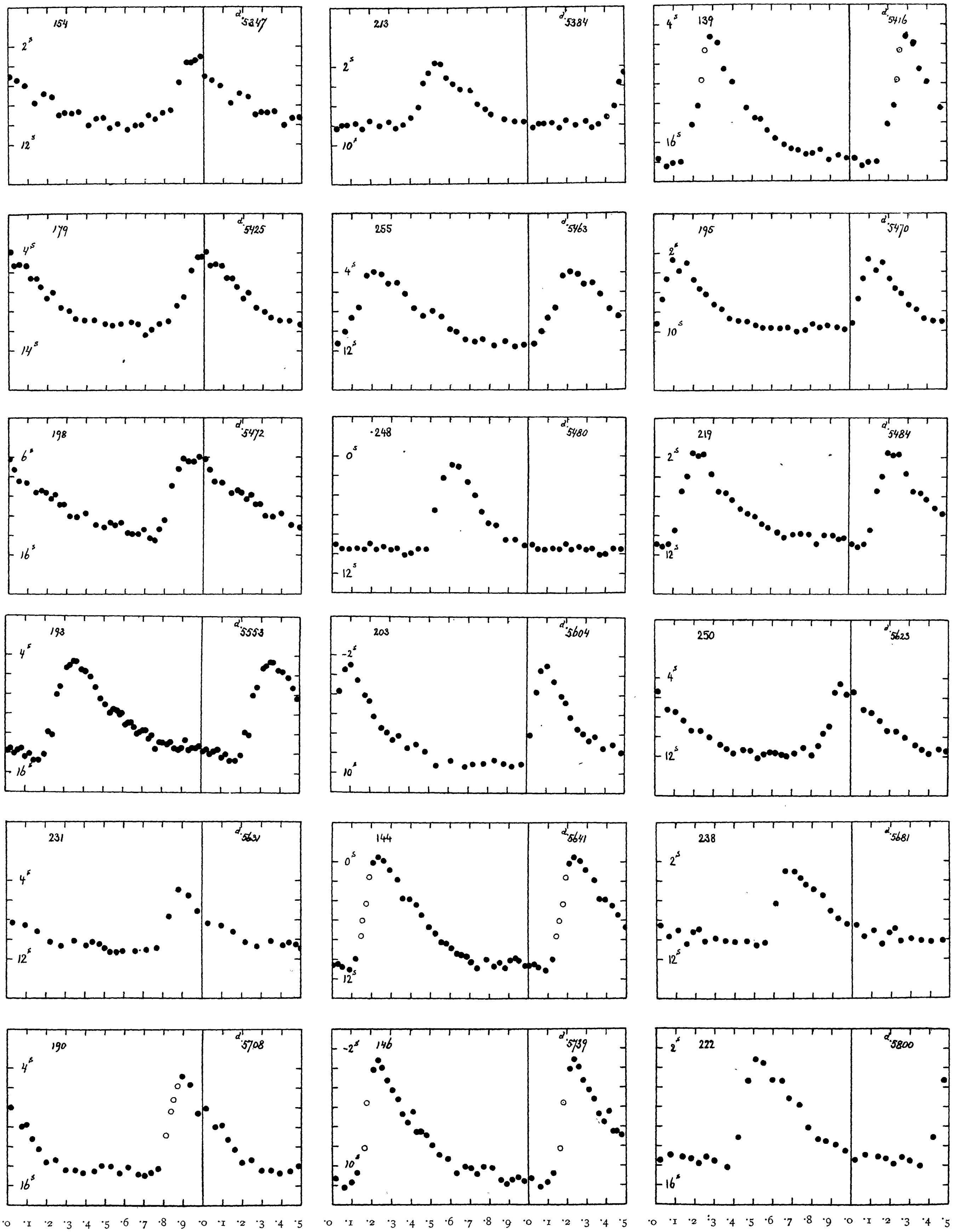
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198 d.5472 6s 16s
248 d.5480 0s 12s
219 d.5484 2s 12s
193 d.5553 4s 16s
203 d.5604 -2s 10s
250 d.5623 4s 12s
231 d.5631 4s 12s
144 d.5641 0s 12s
238 d.5681 2s 12s
190 d.5708 4s 16s
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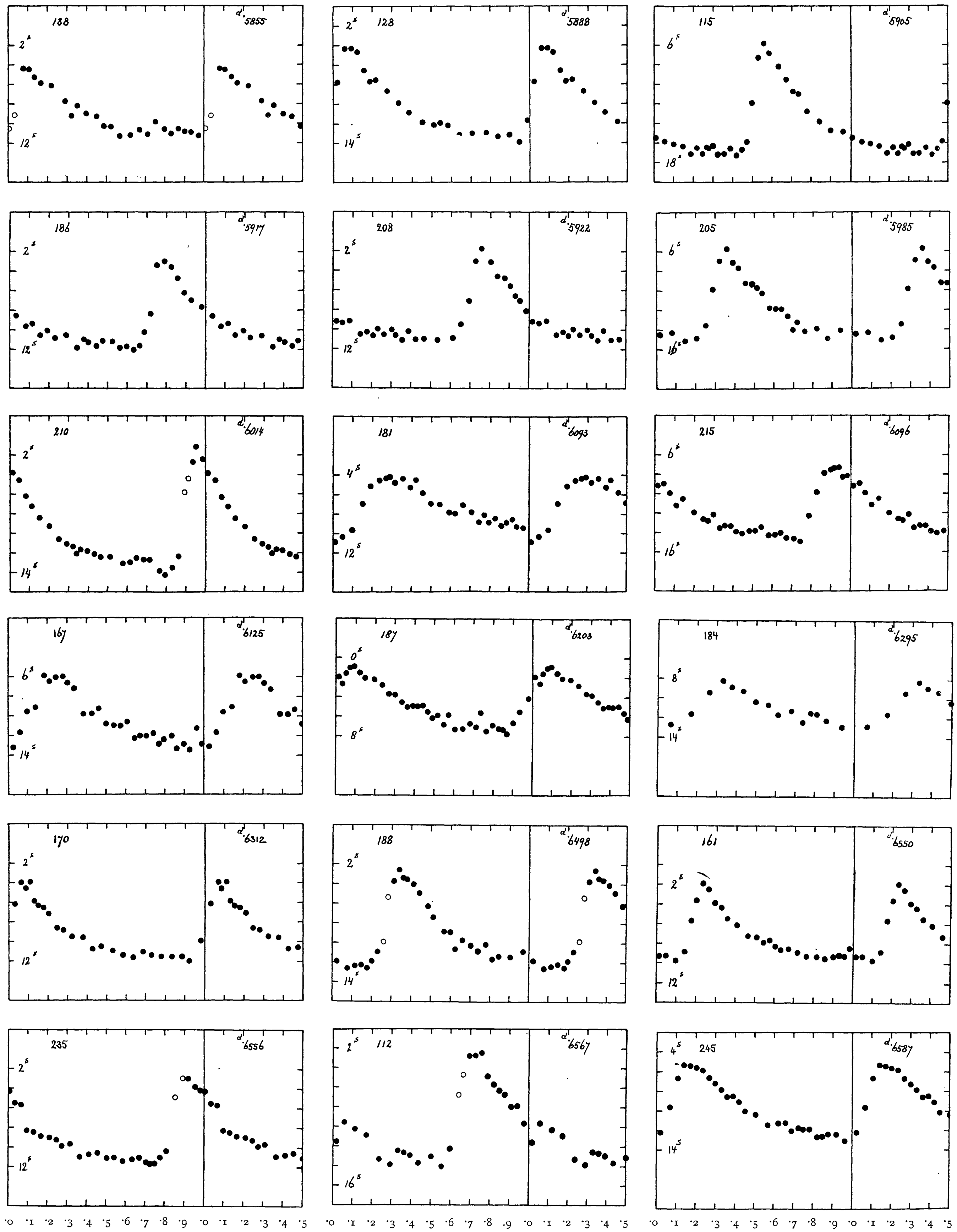
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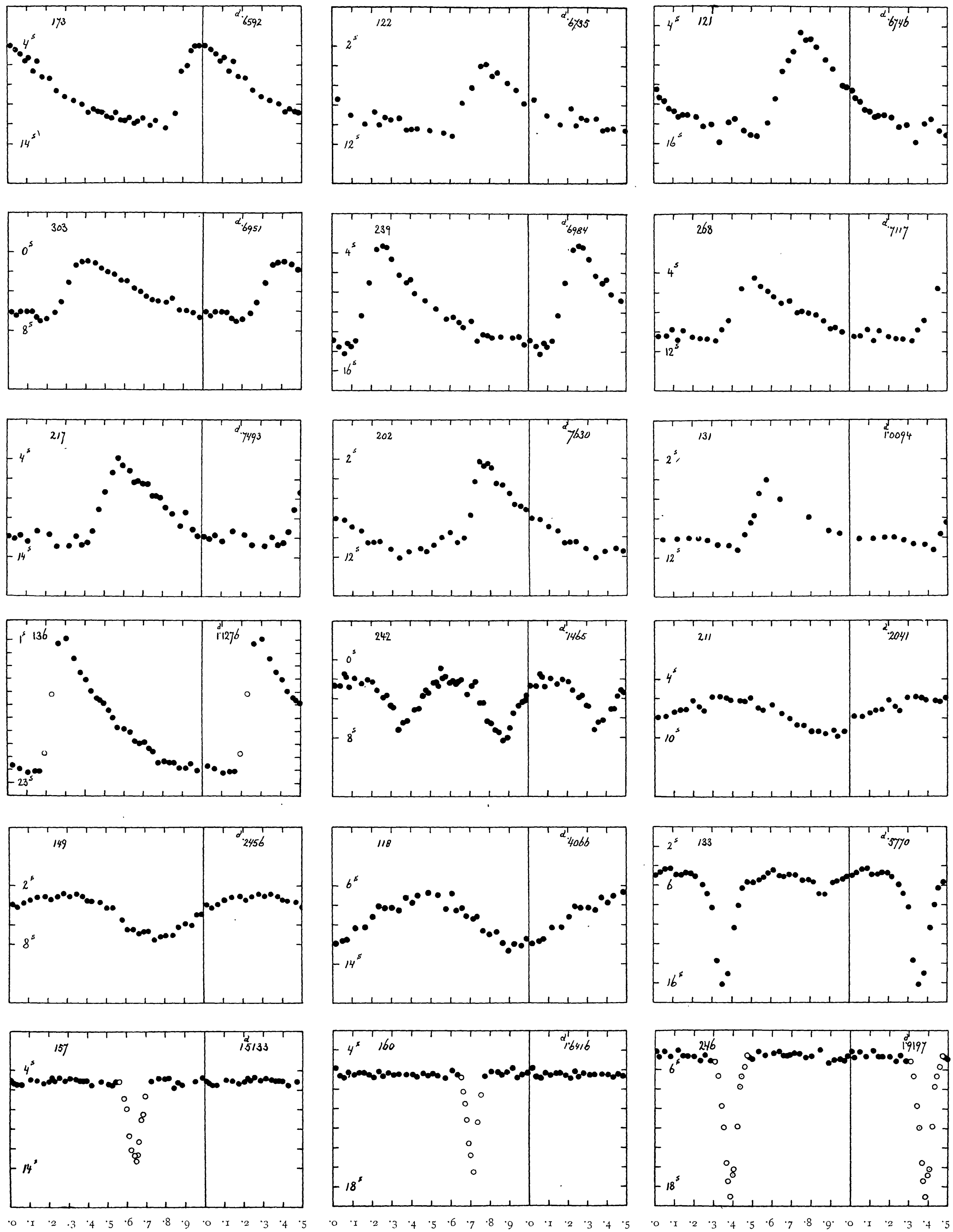
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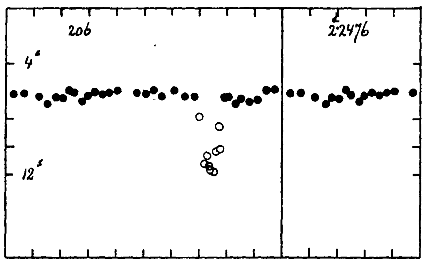
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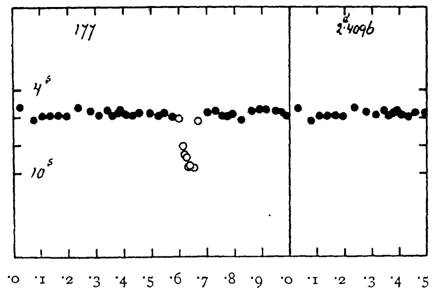
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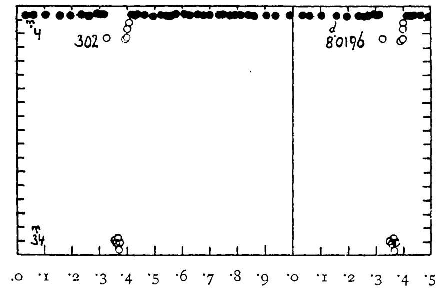
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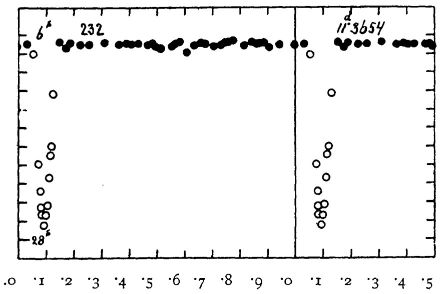
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