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Long-term photometry of variables at ESO*

I. The first data catalogue (1982–1986)

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Abstract. — In this paper we present the catalogue of photometric data in the Strömgren system obtained during the first four years (October 1982 – September 1986) of the Long-Term Photometry of Variables (LTPV) program at the European Southern Observatory. The data are available in computer readable form.

Key words: photometry – stars: variables – *uvby* – data analysis

1. Introduction

Since October 1982, a considerable amount of photometric observing time at the European Southern Observatory has been allotted to the Long-Term Photometry of Variables (LTPV) program (Sterken, 1983). This represents an average of six months per year at one of the small photometric telescopes of La Silla (the ESO 50 cm, the University of Bochum's 61 cm, and the University of Copenhagen's 50 cm). The aim of the program is to study long-term variations of interesting variable stars (time scales of months to years), a goal which is out of reach with observing periods of a few weeks which are usually allocated to individual observers.

Historical considerations and details on the internal working of the project can be found in Sterken (1983, 1986, 1988). The photometric system we have chosen is Strömgren *uvby* because of its astrophysical advantages over the Johnson UBV system. Moreover, it is the only system which can be used at all three telescopes mentioned above.

In this paper we present the first series of observations: those obtained during the first four years (1982–1986).

2. The observations

The observations have been made mostly in one-month periods, each period involving a different observer. Table 1 lists the relevant information, together with the number of useful nights, and the number of useful observations in each period. The last column indicates the particular instrumental system of each observing run.

We have strived to obtain homogeneous data with instrumental systems as close as possible to the standard *uvby*. This is not perfectly feasible since we had to use a variety of telescopes, photometers, and filter sets with different char-

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acteristics. The various instrumental systems are indicated with a one-digit code. The first three columns in Table 2 give the system code, the filter set according to the ESO filter list, and the type of photomultiplier(s). Systems 2 and 3 were used only for a few nights. Due to the long-term character of our work, they do not provide more than one or two measurements per star; in order to keep the data homogeneous we decided not to include in our final list the data obtained with systems 2 and 3.

Figure 1 shows the bandpasses of the filters in systems 4, 6 and 7. (We have not been able to recover the information corresponding to system 1.)

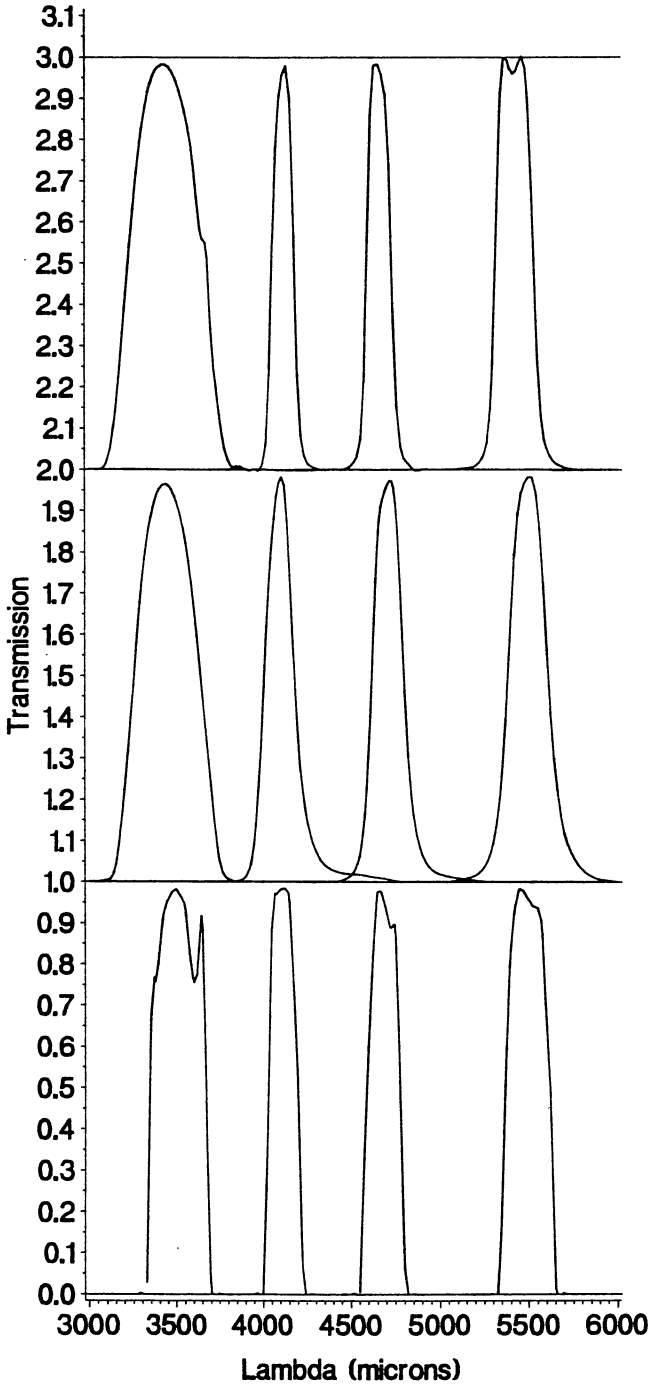

FIGURE 1. Bandpasses of systems 4 (above), 6 and 7

The program stars have been divided into 9 groups, namely

1. Pre-main sequence stars (principal investigators: P.S. Thé, H. Tjin a Djie);
2. Ap Stars (H. Hensberge, J. Manfroid);
3. Eclipsing binaries (H. Duerbeck, A. Bruch);
4. Be stars (N. Vogt, C. Sterken);
5. Supergiants (B. Wolf, M. de Groot);
6. X-ray sources (M. Burger);
7. Targets of opportunity (C. Sterken);
8. Peculiar late-type stars (A. Jorissen, F. Querci);
9. Wolf-Rayet stars (J.M. Vreux, J. Manfroid).

Some general information on program stars can be obtained from the principal investigators. Group 7 consists of objects that need prompt monitoring due to exceptional circumstances (e.g. flares, eclipses, simultaneous space observations).

Within each group a running number identifies the star (the first stars of group 1 are 1001, 1002 ...). The comparison stars of each object have the same identification. They are prefixed by a letter (A, B ...). The program stars code is prefixed by the letter P. The correspondence between these codes and common astronomical identifications (HD, HR...) is given in Table 3. This table lists also how frequently each star has been observed within each period. Depending on the object and the accuracy needed, an observation may consist of a simple sequence APB or APA, or a more extended one like APBPBPA. Because of the long-term nature of the program, multiple observations of a star within a single night were entered in Table 3 as one single independent observation. In this way the total number of observations listed in Table 1 is determined.

3. The data reduction

In a first step the reduction of the data of each period has been done with an improved version of the program PHOT2 (Manfroid 1985). This program uses every measurement of every constant star and of every standard star. Since the LTPV project involves a large number of measurements of comparison stars, the major advantages of PHOT2 are obvious. The implementation of this reduction procedure equally facilitates the task of the observer who does not have to carry out a tedious and complicated schedule of extinction measurements.

The adopted standards are taken from the Olsen list (1983). They have been supplemented by a few stars from

Olsen (1984) which have been used as comparison stars. Manfroid (1985) has emphasized the role that stars, with known *uvby* colours, play in securing a consistent solution.

At first, the colour transformation coefficients were calculated from a relatively small number of nights (one month at best). Although they could be considered as accurate by general standards, we found more accurate values necessary because stars with extreme indices, outside the standard range, are very sensitive to small variations of those coefficients. Consequently we used the preliminary derived matrices only for checking the stability of a given instrumental system. We found that when the same filters and the same type photocathodes were used, the reproducibility was excellent. For instance we are very pleased that the same filters, and comparable photomultipliers, installed on the photometers of two different telescopes (namely the University of Bochum 61 cm, and the ESO 50 cm), resulted in similar colour equations. Those data were thus treated as if coming from the same instrumental system.

The slight month-to-month variations of the computed colour coefficients of the instrumental systems do not follow a clear trend, but appear to be random fluctuations mainly caused by the particular distribution of the standard stars and by measurement errors. Hence we adopt the hypothesis that the colour matrices are stable on a time scale of several years. This is a straightforward extrapolation of one of the fundamental assumptions in the multinight algorithm.

We then proceeded to the second stage of the reduction. The data of each period are reduced to the instrumental system by applying the inverse colour transformation matrix obtained by PHOT2. All data sets corresponding to the same instrumental system are converted to the standard system by a linear transformation. This transformation is obtained by minimizing a "merit function" defined as the sum of the squared deviations of standard star observations to standard values, and of the squared deviations of the constant stars to their average values. These constraints are the same as those imposed by PHOT2, but they are applied to data already corrected for atmospheric extinction. The simpler algorithm allows to handle a quasi unlimited number of nights, whereas PHOT2 requires considerable computer resources for the simultaneous reduction of more than forty or fifty nights.

The adopted procedure allows a continuous updating of the data sets. Every time additional measurements are obtained in one of the instrumental systems, the complete set corresponding to this system is reprocessed.

In *uvby* reduction schemes, the colour transformation matrices are incomplete, i.e. only the diagonal and the first column (corresponding to $b-y$) are not zero. The linear transformation is then written as:

$$\mathbf{U}_s = \mathbf{M}\mathbf{U}_0 + \mathbf{K} \qquad (1)$$

where U is the vector of indices:

$$\mathbf{U} = \begin{pmatrix} b-y \\ y \\ m_1 \\ c_1 \end{pmatrix} \qquad (2)$$

The suffixes s and 0 denote the standard and instrumental values, respectively. K is the vector of zero-points. The colour transformation matrix M is written as

$$\mathbf{M} = \begin{pmatrix} m_{11} & 0 & 0 & 0 \\ m_{21} & 1 & 0 & 0 \\ m_{31} & 0 & m_{33} & 0 \\ m_{41} & 0 & 0 & m_{44} \end{pmatrix} \qquad (3)$$

The final m_{ij} values are listed in the last columns of Table 2, for each instrumental configuration. These values can be used to reconstruct the instrumental data and, by means of the standard measurements, anyone can reprocess the data according to his or her prefered colour transformation scheme. Particularly, it would be quite possible to split the stars into subgroups, and to reduce the red stars ($b-y \gtrsim 0.4$) in a different way than the blue ones. The transformation matrices may also be useful for other observers who used the same systems during that period.

4. Accuracy of the data

It is not easy to assign an error bar to absolute photometric measurements (see Manfroid and Heck, 1984). Comparison of values obtained for the same stars in different systems can give an idea of the accuracy of the absolute results (it could certainly give an idea of the incompatibilities between various versions of the *uvby* system, see e.g. Manfroid and Sterken, 1987, and Sterken and Manfroid, 1988). However, our goal is not an absolute, all-sky, photometry, and since the observations are used for differential photometry, a most representative parameter of the data quality is the standard deviation of the differences between comparison stars. In computing these indices, we have limited ourselves to stars having at least six observations in one run.

Systematic differences appear between different telescopes and also between different runs at the same telescope. The latter variations can be largely attributed to weather conditions (seasonal effect), while the former have also an instrumental cause. This is particularly obvious for the colour indices which are more accurate with the multiband photometer of the Danish telescope. Figures 2a–2d give the histograms of the deviations for each photometric system (the horizontal scale is in millimagnitudes). The mean value of those deviations are listed in Table 4, together with the data relevant to each observing run.

TABLE 4. *Mean value (in units of 0.001 mag) of the rms deviations of the differential measurements of comparison stars (a) during each observing run (b) within each of the 6 instrumental systems. The latter data are detailed in the histograms of figure 2.*

Run #	y	$b-y$	m_1	c_1
1 + 2	10.9	8.8	13.3	13.6
(3	7.1	4.8	6.0	8.7)
4	9.1	4.7	5.4	10.1
5	6.8	4.9	6.5	8.6
6	7.3	5.7	8.8	15.5
7	10.5	8.2	12.2	15.6
8	13.2	10.0	15.3	15.2
9	9.3	7.3	11.1	10.0
10	8.8	6.6	9.8	9.4
11	5.9	4.6	8.1	8.5
12	5.3	5.1	8.3	6.6
13	9.1	6.8	10.2	10.6
14	6.5	5.3	7.1	7.2
15	6.0	2.4	3.1	5.7
16	4.1	2.7	3.3	5.0
17	4.8	2.8	3.5	5.2
18	6.5	3.2	3.7	5.2
19	5.9	3.1	3.8	6.2
20	6.0	2.4	3.2	5.6
21	5.6	5.9	8.8	8.8
22	5.5	3.1	3.8	5.2
23	6.5	5.6	8.9	10.5
24	8.7	5.1	8.0	8.6

System #	y	$b-y$	m_1	c_1
1	10.9	8.8	13.3	13.6
4	6.8	5.7	7.9	11.8
5	8.7	7.0	11.4	11.4
6	9.0	7.8	12.6	13.2
7	7.1	3.3	4.1	6.5

5. The catalogue

The catalogue of the reduced measurements is stored on magnetic tape. It gives the individual measurements of all program stars and comparison stars (identification, heliocentric Julian date, air mass and four-colour data), and can be obtained from the Strasbourg Data Centre. A printed version of the catalogue will be distributed to the libraries of the principal astronomical institutes around the world.

The catalogue contains tables of the average observed V (i.e y), $b-y$, m_1 and c_1 for each standard star, and in each instrumental system. The number of measurements, the standard deviations and the differences between the calculated and the standard values are also listed.

Acknowledgements.

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TABLE 1. *Log of observations*

Run	Month	Heliocentric Jul. dates (−2,440,000.)	Useful nights	Useful data	Observers	Telescopes	Systems
1	October 1982	5245—5273	26	2058	O. Stahl	Bochum	1
2	December 1982	5295—5325	14	590	M. de Groot	Bochum	1
3	January 1983	5354—5380	7+11	[a]	D. vander Linden	Bochum	2,3
4	April 1983	5442—5459	12	855	O. Stahl	Bochum	4
5	August 1983	5562—5586	14	1047	F.-J. Zickgraf	ESO	4
6	September 1983	5588—5608	15	933	H.-A. Ott	ESO	4
7	December 1983	5676—5702	19	1163	O. Stahl	Bochum	4
8	July 1984	5898—5911	14	505	R. Schulte-Ladbeck	Bochum	5
9	August 1984	5914—5944	24	806	T. Hageman	Bochum	5
10	September 1984	5949—5978	18	477	H. Hensberge	Bochum	5
11	October 1984	5980—6014	26	1635	H. Mandel	ESO+Bochum	5
12	January 1985	6066—6098	28	2489	H.W. Duerbeck	ESO	5
13	March 1985	6135—6154	19	1766	O. Stahl	ESO	5
14	June/July 1985	6222—6281	7+6	297	F. Decker, H. Cuypers	Bochum	5
15	August 1985	6287—6297	11	649	A. Bruch	Bochum	5
16	September 1985	6304—6319	15	2934	A. Bruch	Danish	7
17	November 1985	6380—6411	29	2334	A. Reitermann	Danish	7
18	December 1985	6412—6443	28	3905	F.-J. Zickgraf	Danish	7
19	February 1986	6475—6496	22	3322	M. Burger	Danish	7
20	March 1986	6498—6521	22	2521	A. Jorissen	Danish	7
21	June 1986	6581—6609	16	1610	H. Steenman	Danish	7
22	July 1986	6612—6646	22	1220	R. Madejsky	ESO	6
23	August 1986	6658—6675	14	904	A. Figer	Danish	7
24	September 1986	6677—6702	16	716	R. Duemmler	ESO	6

[a] Insufficiently determined photometric systems

TABLE 2. *Instrumental systems*

System	Filter set	Photomultiplier(s)	References	m_{11}	m_{33}	m_{44}	m_{21}	m_{31}	m_{41}
1	BOC 87,106,107,108	EMI6256	Danks, 1982	1.0109	0.9718	0.9341	0.0108	0.0544	-0.3445
4	BOC 89+95,121,122,125	EMI6256	Danks, 1982	1.0340	0.8240	1.0081	-0.0336	0.0911	-0.1905
5	ESO 13,11,8,2	EMI6256	Danks, 1982	1.0819	1.0492	0.9884	0.0343	-0.1681	0.0184
6	ESO 13,11,8,2	RCA9789QB	Danks, 1982	1.0684	1.0660	1.0553	0.0165	-0.1399	0.3106
7	Danish	RCA9789QB	Florentin Nielsen, 1983	1.0238	0.9010	1.0116	0.0119	0.0231	0.1801

TABLE 3. *Stars observed*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
P1001	HD293782	UX Ori	1/9 2/4 10/9 11/21 12/12 15/2 16/10 17/13 18/14 19/8 23/2 24/2
A1001	HD32721	SAO131749	1/9 2/4 10/9 11/21 12/12 15/2 16/10 17/13 18/15 19/8 23/2 24/2
B1001	HD32884	SAO131766	1/8 2/4 10/9 11/21 12/12 16/1
P1002	BD+09.880	AN42.1934	1/5 2/3 7/9 11/1 16/8 17/12 18/15 19/8
A1002	HD37943	BD+10.855	1/5 2/3 7/9 11/1 12/11 16/8 17/18 18/18 19/8
B1002	HD38263	BD+12.884	1/5 2/4 7/8 11/1 16/2
P1003	HD36917	V372 Ori	1/14 2/4 7/4 10/1 11/13 15/2 16/10 17/12 18/14 19/5 24/1
A1003	HD37334	CD−05.1342	1/14 2/4 7/4 10/1 11/13
B1003	HD37687	CD−03.1168	1/14 2/4 7/4 10/1 11/13 15/2 16/10 17/15 18/14 19/5 24/1
P1004	HD36939	BD−05.1308	16/10 17/1 18/14 19/4
A1004	See A1003		
B1004	See B1003		
P1005	HD37062	SAO132329	1/13 2/2 10/1 11/13 16/9 17/11 18/14 19/5
A1005	See A1003		
B1005	See B1003		
P1006	V380 Ori	BD−6.1253	12/13 16/8 17/11 18/14 19/8
A1006	HD37399	BD−06.1269	12/14 15/2 16/8 17/13 18/23 19/8
B1006	HD37210	BD−06.1254	12/14 15/2 16/8 17/13 18/23 19/8
P1007	HD37806	SAO132452	12/12 16/8 17/10 18/15 19/8 23/2
A1007	HD37805	BD−2.1343	12/12 16/8 17/10 18/15 19/8 23/2
B1007	HD37927	BD−2.1348	12/12 16/8 17/10 18/15 19/8 23/2
P1008	FU Ori	CSI+9.05427	1/5 2/3 7/9 11/1 12/11 16/5 17/9 18/15 19/4
A1008	See A1002		
P1009	HD250550	MWC789	17/1 18/15 19/7
A1009	HD40316	SAO95068	17/1 18/14 19/7
B1009	HD40005	SAO95025	17/1 18/15 19/7
P1010	HD259431	BD10.1172	1/13 2/3 7/8
A1010	HD44944	SAO95649	1/13 2/3 7/8
B1010	HD46075	HR2374	1/13 2/3 7/8
P1011	MWC165	Z CMa	17/1 18/15 19/11
A1011	HD54141	BD−09.1854	1/3 7/4 11/13 13/5 17/1 18/15
B1011	HD53240	HR2656	1/3 7/4 11/13 13/5 17/10 18/15 19/11 23/1
P1012	HD53367	SAO152320	1/3 7/4 11/13 13/5 17/9 18/15 19/10 23/1
A1012	See A1011		
B1012	See B1011		
P1013	NX Pup	CD−44.3318	1/7 2/4 7/8 11/18 12/13 13/8 17/12 18/27 19/14
A1013	HD52096	CD−42.2851	1/7 2/4 7/8 11/18 12/13 13/8 17/12 18/27 19/14
B1013	HD60813	CD−42.3338	1/7 2/4 7/8 11/18 12/13 13/8
P1015	HD97048	SAO256802	2/1 4/8 7/5 12/9 13/9 18/9 21/6 22/1
A1015	HD98143	SAO256818	2/1 4/8 7/5 12/9 13/12 18/9 21/6 22/1
B1015	HD96675	SAO256798	2/1 4/8 7/5 12/9 13/12 21/1
P1016	HD97300	CPD−75.714	4/7 7/5 12/9 13/3 18/9 21/6 22/1
A1016	See A1015		
B1016	See B1015		
P1017	HD144668	HR5999	4/7 5/9 6/10 8/5 9/11 13/12 14/6 15/8 16/15 19/19 20/16 21/13 22/19 23/9 24/2
A1017	HD143699	HR5967	4/7 5/9 6/10 8/5 9/11 13/12 14/5 15/8 16/15 19/19 20/16 21/13 22/19 23/9 24/3
B1017	HD145191	HR6015	4/7 5/9 6/10 8/5 9/11 13/12 15/1 16/14 21/8
P1018	HD144667	HR6000	4/7 5/7 6/7 8/4 9/11 13/11 14/5 15/8 16/15 19/10 20/9 21/7 22/11 23/6 24/2
A1018	See A1017		
B1018	See B1017		
P1024	SAO210829	CD−37.13024	1/14 4/1 5/6 6/4 8/5 9/5 10/3 11/12 14/2 15/3 16/10 21/5 22/7 23/1 24/7
A1024	HD176616	SAO210853	1/14 4/1 5/6 6/5 8/5 9/5 10/4 11/12 16/3
B1024	HD177123	SAO210895	1/14 4/1 5/6 6/5 8/5 9/5 10/5 11/12 14/2 15/3 16/9 21/5 22/7 23/1 24/7
P1026	HD148605	HR6141	4/1 6/3 8/5 9/13 10/1 13/4 14/3 19/2 20/8 21/4 22/9 23/10 24/8
P1028	HD161114	SAO141834	5/6 6/3 8/1 9/3 13/5 15/4 16/15 21/8 22/7 23/2 24/2
A1028	SAO142339	BD−04.4476	5/6 6/3 8/1 9/3 13/5 15/5 16/15 21/8 22/7 23/2 24/2
P1029	HD245465	BD+06.0971	12/9 16/6 17/9 18/15 19/2
A1029	HD37089	BD+06.969	12/9 16/6 17/9 18/15 19/2
B1029	HD36934	BD+06.964	12/9 16/6 17/9 18/15 19/2
P1030	HD287841	V346 Ori	5/5 6/5 12/12 15/1 16/9 17/11 18/16 19/3

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
A1030	HD35192	BD+00.1035	5/5 6/5 12/12 15/1 16/9 17/11 18/16 19/3
B1030	HD35298	BD+01.0996	5/5 6/5 12/12 15/1 16/9 17/11 18/16 19/3
P1031	BD−06.1259	BF Ori	12/14 15/2 16/6 17/11 18/15 19/2
A1031	See A1006		
B1031	See B1006		
P1032	Lk-Hα 118		21/2 22/3 23/1
A1032			21/2 22/4 23/1
P1033	Lk-Hα 119		21/1 22/2 23/1
A1033	See A1032		
P1034	HD152404	SAO208174	21/14 23/4 24/1
A1034	HD152216	SAO208145	21/14 23/4 24/1
B1034	HD152196	SAO208146	21/14 23/4 24/1
P1037	See P1034		
A1037	See A1034		
B1037	See B1034		
P2001	HD315	HR 11	1/10 2/4 5/2 6/4 7/2 8/8 9/9 10/6 11/22 12/2 14/5 15/9 16/13 17/21 18/16 21/3 22/17 23/8 24/7
A2001	HD224945		1/9 2/4 5/2 6/4 7/2 8/7 9/9 10/6 11/22 15/3 16/12 17/5 18/4 21/2 22/4 23/4 24/3
B2001	HD294		1/10 2/4 5/2 6/4 7/2 8/7 9/8 10/6 11/22 12/1 14/5 15/9 16/13 17/21 18/16 21/3 22/17 23/8 24/7
P2002	HD3326	HR 151	1/8 2/3 5/3 6/7 7/3 8/1 9/1 10/1 11/3 12/3 14/1 15/1 16/8 17/1 18/1 21/1 22/1 23/1 24/1
A2002	HD4247	HR 197	1/8 2/3 5/3 6/7 7/3 8/1 9/1 10/1 11/3 12/3 14/1 16/8 17/1 18/1 21/1 22/1 23/1 24/1
B2002	HD4772	HR 232	1/8 2/3 5/3 6/7 7/3 8/1 9/1 10/1 11/3 12/3 14/1 15/1 16/8 17/1 18/1 21/1 22/1 23/1 24/1
P2003	HD71066	HR3302	1/3 2/3 4/2 7/3 11/5 12/6 13/4 18/9 19/7 20/5
A2003	HD71576	HR3334	1/3 2/3 4/2 7/3 11/5 12/6 13/4 18/9 19/7 20/5
B2003	HD76270	HR3544	1/3 2/3 4/2 7/3 11/5 12/6 13/4 18/9 19/7 20/5
P2004	HD59256	HR2863	4/2 7/3 11/4 12/9 13/3 17/2 18/4 19/3 20/2
A2004	HD60863	HR2922	4/2 7/3 11/4 12/9 13/3 17/2 18/4 19/3 20/2
B2004	HD61672	HR2956	4/2 7/3 11/4 12/9 13/3 17/2 18/4 19/3 20/2
P2005	HD94660	HR4263	2/1 4/2 7/1 12/6 13/4 14/1 18/8 19/6 20/7 21/3 22/2
A2005	HD94724		2/1 4/2 7/1 12/6 13/4 14/1 18/7 19/6 20/7 21/3 22/2
B2005	HD93453		2/1 4/2 7/1 12/6 13/4 14/1 18/7 19/6 20/7 21/3 22/2
P2006	HD107696	HR4706	4/3 12/3 13/3 14/2 18/2 19/3 20/4 21/2 22/2
A2006	HD110506	HR4834	2/1 4/3 12/3 13/3 14/2 18/2 19/3 20/4 21/2 22/2
B2006	HD104430	HR4592	2/1 4/3 12/3 13/3 14/2 18/2 19/3 20/4 21/2 22/2
P2007	HD116458	HR5049	4/3 9/2 12/5 13/4 14/2 19/7 20/5 21/3 22/4
A2007	HD116579	HR5051	4/3 9/2 12/5 13/4 14/2 19/7 20/5 21/3 22/4
B2007	HD115967	HR5030	4/3 9/2 12/5 13/4 14/2 19/7 20/5 21/3 22/4
P2008	HD151771	HR6244	4/3 5/1 6/1 8/2 9/3 10/1 13/4 14/2 15/2 16/13 19/3 20/3 21/1 22/3 23/3
A2008	HD153072	HR6298	4/3 5/1 6/1 8/2 9/3 10/1 13/4 14/2 15/2 16/13 19/3 20/3 21/1 22/3 23/3
B2008	HD151726		4/3 5/1 6/1 8/2 9/3 10/1 13/4 14/2 15/2 16/13 19/3 20/3 21/1 22/3 23/3
P2009	HD165040	HR6745	4/2 6/2 10/1 13/3 14/2 15/1 16/7 19/1 20/1 21/1 23/2 24/1
A2009	HD168740	HR6871	4/2 6/2 10/1 13/3 14/2 15/1 16/7 19/1 20/1 21/1 23/2 24/1
B2009	HD165499	HR6761	4/2 6/1 10/1 13/3 14/2 15/1 16/7 19/1 20/1 21/1 23/2 24/1
P2010	HD187474	HR7552	1/3 4/2 5/2 6/6 8/1 9/1 10/2 11/3 13/3 14/1 15/1 16/10 21/1 22/2 23/2 24/2
A2010	HD189388	HR7639	1/3 4/5 5/4 6/7 8/8 9/9 10/8 11/3 13/6 14/2 15/3 16/13 21/5 22/8 23/5 24/9
B2010	HD185691		1/3 4/2 5/2 6/6 8/1 9/1 10/2 11/3 13/3 14/1 15/1 16/10 21/1 22/2 23/2 24/2
P2011	HD188041	HR7575	1/4 4/1 5/3 6/1 8/1 9/3 10/3 11/3 13/2 15/2 16/7 21/2 22/1 23/1 24/2
A2011	HD185124	HR7460	1/4 4/1 5/3 6/1 8/1 9/3 10/3 11/3 13/2 15/1 16/8 21/2 22/1 23/1 24/2
B2011	HD189359		1/4 4/1 5/3 6/1 8/1 9/3 10/3 11/3 13/2 15/2 16/7 21/2 22/1 23/1 24/2
P2012	HD191984	HR7717	1/3 4/1 5/5 6/3 8/4 9/3 10/1 11/4 15/5 16/13 21/3 22/2 23/2
A2012	HD191709		1/3 4/1 5/5 6/3 8/4 9/2 10/1 11/4 15/6 16/13 21/3 22/2 23/2
B2012	HD188350	HR7596	1/3 4/1 5/5 6/3 8/4 9/3 10/1 11/4 15/6 16/13 21/3 22/2 23/2
P2013	HD201601	HR8097	1/3 5/3 6/2 8/1 9/2 10/1 11/4 15/1 16/4 21/1 22/1 23/1 24/1
A2013	HD201616	HR8098	1/3 5/3 6/2 8/1 9/2 10/1 11/4 15/1 16/4 21/1 22/1 23/1 24/1
B2013	HD202275	HR8123	1/3 5/3 6/2 8/1 9/2 10/1 11/4 15/1 16/4 21/1 22/1 23/1 24/1
P2014	HD221760	HR8949	1/23 2/3 5/13 6/13 7/6 8/4 9/9 10/3 11/5 14/3 15/2 16/11 17/2 18/3 21/2 22/2 23/5 24/3
A2014	HD222095	HR8959	1/23 2/3 5/13 6/13 7/6 8/4 9/10 10/3 11/5 14/3 15/2 16/11 17/2 18/3 21/2 22/2 23/5 24/3
B2014	HD223011	HR9001	1/23 2/4 5/13 6/13 7/6 8/4 9/9 10/3 11/5 14/2 15/2 16/11 17/2 18/3 21/1 22/2 23/5 24/3
P2015	HD29009	HR1449	1/22 2/6 6/8 7/12 10/6 12/9 15/3 16/12 17/25 18/28 19/16 23/8 24/3
A2015	HD27563	HR1363	1/22 2/6
B2015	HD27660		6/8 7/12 10/6 12/9 15/3 16/12 17/25 18/28 19/16 23/7 24/3

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
C2015	HD28980		6/8 7/12 10/5 12/9 15/3 16/12 17/25 18/28 19/16 23/8 24/3
P2016	HD41089		1/22 2/3 6/7 7/10 10/3 12/7 13/1 15/2 16/9 17/26 18/27 19/22 20/15 23/7
A2016	HD42303	HR2181	1/22 2/3 6/7 7/10 10/4 12/7 13/1 15/2 16/9 17/26 18/27 19/20 20/15 23/7
B2016	HD41742	HR2158	1/20 2/3 6/7 7/10 10/3 12/7 13/1 15/2 16/9 17/25 18/27 19/22 20/15 23/7
P2017	HD54118	HR2683	1/21 2/2 4/2 7/9 12/8 13/4 17/21 18/26 19/20 20/1 23/5
A2017	HD52622	HR2638	1/21 2/2 4/2 7/9 12/8 13/4 17/21 18/27 19/20 20/1 23/5
B2017	HD57969		1/21 2/2 4/2 7/9 12/8 13/4 17/21 18/27 19/20 20/1 23/5
P2018	HD90044	HR4082	2/2 4/6 7/5 12/5 13/4 14/1 18/26 19/21 20/20 21/7
A2018	HD90882	HR4116	2/2 4/6 7/5 12/5 13/4 14/1 18/26 19/21 20/20 21/7
P2019	HD103192	HR4552	2/1 4/7 7/2 12/6 13/4 18/15 19/20 20/20 21/12 22/4
A2019	HD101431	HR4494	2/1 4/7 7/2 12/6 13/4 18/15 19/21 20/20 21/12 22/4
P2020	HD159376	HR6545	4/4 6/1 8/2 9/7 10/1 13/3 14/2 15/1 16/15 19/8 20/6 21/4 22/5 23/3 24/1
A2020	HD160915	HR6595	4/5 5/4 6/5 8/4 9/15 10/2 13/7 14/2 15/1 16/15 19/8 20/6 21/5 22/12 23/4 24/1
B2020	HD156897	HR6445	4/4 6/1 8/2 9/7 10/1 13/3 15/1 16/15 19/8 20/6 21/4 22/5 23/3 24/1
P2021	HD168733	HR6870	4/4 6/1 8/1 9/8 10/2 13/3 14/2 15/2 16/14 19/4 21/5 22/2 23/2 24/3
A2021	HD169679		4/4 6/1 8/1 9/8 10/2 13/3 14/1 15/2 16/14 19/4 21/6 22/2 23/2 24/3
B2021	HD167233		4/4 6/1 8/1 9/8 10/2 13/3 14/2 15/2 16/14 19/4 21/5 22/2 23/2 24/3
P2022	HD189832		4/3 5/2 6/5 8/7 9/9 10/8 13/3 14/1 15/2 16/12 21/4 22/6 23/5 24/8
A2022	See A2010		
B2022	HD191889		4/3 5/2 6/5 8/7 9/9 10/7 13/3 15/2 16/10 21/4 22/6 23/5 24/8
P2023	HD 5737	HR280	8/1 9/2 17/24 18/12 21/2 22/13 23/10 24/12
A2023	HD 6178	HR293	8/1 9/2 17/24 18/12 21/2 22/13 23/10 24/12
B2023	HD 4691		8/1 9/1 17/24 18/12 21/2 22/13 23/10 24/12
P3001	HD26750	SAO149466	1/7 2/2 5/4 6/6 7/4 10/2 11/2 12/26 15/1 16/10 17/2 18/3 19/2 20/2 23/2 24/1
A3001	HD26902	SAO149482	1/7 2/2 5/4 6/6 7/4 10/2 11/2 12/26 15/1 16/10 17/2 18/3 19/2 20/2 23/2 24/1
B3001	HD26465	SAO149430	1/7 2/2 5/4 6/6 7/4 12/27 15/1 16/9 17/2 18/3 19/2 20/2 23/2
P3002	HD29248	HR1463	2/3 5/6 6/8 7/6 16/11 17/6 24/2
A3002	HD28843	HR1441	1/1 2/3 5/6 6/8 7/6 16/11 19/2 24/2
B3002	HD30211	HR1520	2/3 5/6 6/8 7/6 16/11 24/2
P3003	HD57060	HR2781	1/7 2/3
A3003	HD58612	HR2841	1/7 2/6 4/3 12/11 13/9 17/23 18/5 19/4 20/1 23/1
B3003	HD55522	HR2718	1/7 2/3
P3004	HD60414	HR2902	1/2 2/1 4/2 7/4 11/2 12/27 13/5 17/1 18/2 19/1 20/1
A3004	HD59438	HR2868	1/2 2/1 4/2 7/4 11/2 12/27 13/5 17/1 18/2 19/1 20/1
B3004	HD60552	SAO153083	1/2 2/1 4/2 7/4 11/2 12/27 13/5 17/1 18/2 19/1 20/1
P3005	LW Pup		1/3 2/3 4/2 7/5 11/4 12/27 13/5 17/2 18/6 19/5 20/4
A3005	HD66740	SAO175094	1/3 2/3 4/2 7/5 11/4 12/27 13/5 17/2 18/6 19/5 20/4
B3005	HD67357	SAO175189	1/3 2/3 4/2 7/5 11/4 12/27 13/5 17/2 18/6 19/4 20/4
P3006	AL Vel	SAO220040	1/3 2/1 4/2 7/5 11/10 12/26 13/5 17/2 18/11 19/8 20/5
A3006	HD71949	SAO219970	1/3 2/1 4/2 7/5 11/10 12/27 13/5 17/2 18/11 19/7 20/5
B3006	HD72109	SAO219984	1/3 2/1 4/2 7/5 11/10 12/27 13/5 17/2 18/11 19/8 20/4
P3007	FY Vel	SAO220069	1/4 2/2 4/3 7/6 11/5 12/27 13/5 17/2 18/11 19/8 20/5
A3007	HD71695	SAO219929	1/4 2/2 4/3 7/6 11/5 12/27 13/5 17/2 18/11 19/8 20/5
B3007	HD71721	SAO219935	1/4 2/2 4/3 7/6 11/5 12/27 13/5 17/2 18/11 19/8 20/5
P3008	WY Vel	SAO236888	1/2 2/1 4/3 7/5 11/5 12/25 13/6 18/5 19/4 20/4 21/1
A3008	HD80936	SAO236867	1/2 2/1 4/3 7/5 11/5 12/25 13/6 18/5 19/4 20/4 21/1
B3008	HD81433	CD513764	1/2 2/1 4/3 7/5 11/5 12/25 13/6 18/5 19/4 20/4 21/1
P3009	HD94878	GG Car	2/2 4/4 7/4 8/11 12/12 13/4 18/8 19/7 20/8 21/4
A3009	HD305773	SAO251184	7/4 12/1 18/8 21/3
B3009	HD94715	SAO238593	7/4 18/8 21/3
P3010	HD101584	SAO239288	2/1 4/4 7/2 12/26 13/5 18/2 19/3 20/3 21/1 22/1
A3010	HD102113	SAO239346	2/1 4/4 7/2 12/26 13/5 18/2 19/3 20/3 21/1 22/1
B3010	HD100735	SAO239198	2/1 4/4 7/2 12/26 13/5 18/2 19/3 20/3 21/1 22/1
P3011	HD101712	SAO251544	2/1 4/2 7/2 12/26 13/5 18/1 19/2 20/3 21/1 22/1
A3011	HD101498	SAO251528	2/1 4/2 7/2 12/26 13/5 18/1 19/2 20/3 21/1 22/1
B3011	HD101684	SAO251542	2/1 4/2 7/2 12/26 13/5 18/1 19/2 20/3 21/1 22/1
P3012	HD105998	W Cru	4/3 9/1 12/26 13/5 14/1 18/2 19/5 20/4 21/2 22/2
A3012	SAO239793		4/3 9/1 12/26 13/5 14/1 18/2 19/5 20/5 21/2 22/2
B3012	HD106086	SAO239751	4/3 9/1 12/26 13/5 14/1 18/2 19/5 20/4 21/2 22/2
P3013	HD113904	HR4952	4/5 8/4 9/8 12/25 13/5 14/4 19/7 20/6 21/5 22/5 23/1

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
A3013	HD114570	HR4977	4/5 8/4 9/8 12/25 13/5 14/4 19/7 20/6 21/5 22/5 23/1
B3013	HD114911	HR4993	4/5 8/4 9/7 12/24 13/5 14/4 19/7 20/6 21/5 22/5 23/1
P3014	HD161387	SAO185724	1/3 4/4 5/2 6/1 9/2 10/1 11/1 13/6 14/2 15/2 16/12 19/3 21/2 22/4 23/1
A3014	HD167978	SAO186630	1/3 4/4 5/2 6/1 9/2 10/1 11/1 13/6 14/2 15/2 16/13 19/3 21/2 22/4 23/1
B3014	SAO185726		1/3 4/4 5/2 6/1 9/2 10/1 11/1 13/6 14/2 15/2 16/12 19/3 21/2 22/4 23/1
P3015	HD164270		1/19 2/3 4/8 5/10 6/6 7/6 8/2 9/9 10/6 11/10 12/9 13/12 16/8 17/9 18/12 19/6 20/3 24/6
A3015	HD158528		1/7 4/6 5/10 6/4 13/6
B3015			1/9 4/6 5/10 6/4 13/6
P3016	HD166937	HR6812	1/3 4/3 5/3 6/2 13/1 14/1 16/15 21/2 22/1 23/3
A3016	HD167263	HR6823	1/3 4/3 5/3 6/2 13/1 14/1 16/15 21/2 22/1 23/3
B3016	HD167264	HR6822	1/3 4/3 5/3 6/2 13/1 14/1 16/14 21/2 22/1 23/3
P3017	AR Pav		1/3 4/3 5/2 6/1 8/1 9/7 10/3 11/6 15/1 16/10 19/1 21/2 23/1 24/1
A3017			1/3 4/3 5/2 6/1 8/1 9/7 10/3 11/6 14/1 15/1 16/10 19/1 21/2 23/1 24/1
P3018	HD168206	SAO161325	1/4 4/3 5/4 8/12 9/10 10/6 11/4 15/4 16/14 22/3 23/1
A3018	HD168639		1/4 4/3 5/4 8/12 9/10 10/5 11/4 15/5 16/14 21/1 22/3 23/1
P3019	HD177300	SAO245923	1/7 4/4 5/14 6/10 13/1 21/10 22/7 23/3 24/7
A3019	HD179775	SAO246003	1/7 4/4 5/14 6/10 21/10 22/7 23/3 24/7
B3019	HD179034	SAO245980	1/7 4/4 5/14 6/10 21/10 22/7 23/3 24/7
P3020	HD181615	HR7342	1/6 4/2 5/3 6/3 8/11 9/8 10/4 11/19 14/3 15/2 16/14 21/3 22/3 23/3 24/1
A3020	HD180659		1/6 4/2 5/3 6/3 8/11 9/8 10/4 11/19 14/2 15/4 16/14 21/3 22/3 23/3 24/1
B3020	HD181645	HR7344	1/6 4/2 5/3 6/3 8/11 9/8 10/4 11/19 14/3 15/3 16/14 21/3 22/3 23/3 24/1
P3021	BI Cru		12/3 13/2 18/1 19/2 20/2 21/1 22/1
A3021	HD107773	HR4710	12/3 13/2 18/1 19/2 20/3 21/1 22/1
B3021	HD107759		12/3 13/2 18/1 19/2 20/2 21/1 22/1
P3022	HD100336	SY Mus	12/3 13/2 18/2 19/2 20/4 21/2 22/1
A3022	HD100445		12/3 13/2 18/2 19/2 20/4 21/2 22/1
B3022	HD100101		12/3 13/2 18/2 19/2 20/4 21/2 22/1
P3023	HD117970	SAO181760	8/1 12/1 13/2 14/4 19/2 20/3 21/2 22/2
A3023	SAO181752		8/1 12/1 13/2 14/4 19/2 20/3 21/2 22/2
B3023	SAO181761		12/1 13/2 14/4 19/2 20/3 21/2 22/2
P3024	BD−21.3873		12/1 13/2 14/1 15/1 16/1 19/3 20/3 21/2 22/2
A3024	SAO182494		12/1 13/2 14/1 15/1 16/1 19/3 20/3 21/2 22/2
B3024	SAO182341		12/1 13/2 14/1 15/1 16/1 19/3 20/3 21/2 22/2
P3025	HD330036		5/2 12/1 13/2 16/9 19/3 20/3 21/2 22/1 23/1
A3025	HD330034		5/2 13/2 16/9 19/3 20/3 21/2 22/1 23/1
B3025	HD330035		5/2 13/2 16/9 19/3 20/3 21/2 22/1 23/1
P3026	HM Sge		5/1 6/2 15/1 16/11 21/1 22/1
A3026	SAO105208		5/1 6/2 15/1 16/10 21/1 22/1
B3026	SAO105279		5/1 6/2 15/1 16/11 21/1 22/1
P3027	AS338		15/5 16/13 21/6 22/7 23/2
A3027	HD177225	SAO104415	15/6 16/14 21/7 22/7 23/1
B3027	HD230711	SAO104494	15/5 16/13 21/6 22/5 23/1
P3028	HD81410		12/26
A3028	HD81904		12/26
B3028	HD80991		12/24
P4001	HD33328	HR1679	2/2 5/5 6/5 12/13 15/2 16/12 17/27 18/26 19/2 23/5
A4001	HD33224	HR1671	1/1 2/2 5/5 6/5 12/13 15/2 16/12 17/27 18/10 19/2 23/5
B4001	HD32249	HR1617	2/2 5/5 6/5 12/13 15/2 16/11 17/27 18/26 19/2 23/5
P4002	HD41335	HR2142	1/21 2/5 5/3 6/5 7/17 10/6 11/20 12/11 13/6 15/2 16/7 17/12 18/16 19/10 20/1 23/2
A4002	HD42690	HR2205	1/21 2/5 5/3 6/6 7/17 10/6 11/20 12/11 13/6 15/2 16/7 17/12 18/16 19/10 20/1 23/2
B4002	HD45546	HR2344	1/21 5/3 6/4 7/17 10/6 11/20 12/11 13/6 15/2 16/7 17/12 18/16 19/10 20/1 23/2
P4003	HD48914	V505 Mon	1/19 2/5 6/2 7/16 11/20 12/12 13/6 16/6 17/24 18/26 19/21 20/10
A4003	HD48434	HR2479	1/19 2/5 6/2 7/16 11/20 12/12 13/6 16/6 17/24 18/26 19/21 20/10
B4003	HD49567	HR2517	1/19 2/5 6/2 7/16 11/20 12/12 13/6 16/5 17/24 18/26 19/20 20/10
P4004	HD48917	HR2492	1/7 2/4 4/3 6/4 7/6 11/8 12/12 13/6 16/6 17/4 18/12 19/12 20/3 23/1
A4004	HD46936	HR2415	1/7 2/4 4/3 6/4 7/6 11/8 12/12 13/6 16/7 17/5 18/13 19/12 20/12 23/1
B4004	HD49028	HR2497	6/4 7/6 11/8 12/12 13/6 16/6 17/5 18/13 19/12 20/12 23/1
P4005	HD56014	HR2745	2/3 4/3 12/11 13/9 17/23 18/25 19/4 20/1 23/1
A4005	HD56876	HR2774	2/3 4/3 7/2 11/23 12/13 13/17 17/23 18/26 19/21 20/16 23/2
B4005	See A3003		

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
P4006	HD56139	HR2749	2/3 12/11 13/6 17/22 18/25
A4006	See A4005		
B4006	See A3003		
P4007	HD58978	HR2855	1/4 2/3 4/2 7/4 11/20 12/10 13/6 17/2 18/4 19/3 20/3
A4007	HD59136	HR2860	1/4 2/3 4/2 7/4 11/20 12/10 13/6 17/2 18/4 19/3 20/3
B4007	HD58346	HR2826	1/4 2/3 4/2 7/4 11/20 12/10 13/6 17/2 18/4 19/3 20/3
P4008	HD68980	HR3237	1/3 2/2 4/3 7/4 11/20 12/9 13/5 17/2 18/5 19/3 20/3
A4008	HD70556	HR3283	1/3 2/2 4/3 7/4 11/20 12/9 13/5 17/2 18/5 19/4 20/3
B4008	HD70060	HR3270	1/3 2/2 4/3 7/4 11/20 12/9 13/5 17/2 18/5 19/4 20/3
P4009	HD142983	HR5941	4/7 5/11 6/6 8/4 9/10 13/11 14/8 15/6 16/15 19/19 20/18 21/13 22/19 23/2
A4009	HD143333	HR5954	4/7 5/11 6/6 8/4 9/9 13/11 14/7 15/9 16/15 19/19 20/18 21/13 22/19 23/2
B4009	HD142640	HR5927	4/7 5/11 6/6 8/4 9/10 13/11 14/8 15/9 16/15 19/19 20/18 21/13 22/19 23/2
P4010	HD173219		1/3 4/6 5/12 6/3 8/2 9/6 10/5 11/3 13/2 14/3 15/7 16/14 21/11 22/8 23/4 24/1
A4010	HD173693	SAO142612	1/3 4/6 5/11 6/3 8/2 9/6 10/5 13/2 14/2 23/3 24/1
B4010	HD173673	SAO142610	1/3 4/6 5/12 6/3 8/2 9/6 10/5 11/3 13/2 14/3 15/7 16/14 21/11 22/10 23/3 24/1
P4011	HD183656	HR7415	1/4 4/4 5/4 6/3 8/5 9/3 10/3 11/4 13/2 15/4 16/15 21/3 22/3 23/1
A4011	HD183324	HR7400	1/4 4/4 5/4 6/3 8/5 9/3 10/3 11/4 13/2 15/3 16/15 21/3 22/3 23/4
B4011	HD183227	HR7397	1/4 4/4 5/4 6/3 8/5 9/3 10/3 11/4 13/2 15/4 16/15 21/2 22/3 23/4
P4012	HD184279	V1294 Aql	1/4 4/4 5/4 6/3 8/1 10/2 11/1 13/2 15/2 16/15 21/2 23/3
A4012	See A4011		
B4012	See B4011		
P4013	HD205637	HR8260	1/24 4/4 5/13 6/9 8/8 9/13 10/8 11/23 13/1 14/3 15/5 16/12 21/1 22/5 23/4 24/3
A4013	HD200761	HR8075	1/24 2/2 4/4 5/13 6/9 8/8 9/13 10/9 11/23 13/1 14/3 15/3 16/13 21/1 22/5 23/4 24/3
B4013	HD205289	HR8245	1/24 2/2 4/4 5/13 6/9 8/8 9/13 10/8 11/23 13/1 14/3 15/5 16/12 21/1 22/5 23/4 24/3
P4014	HD50123	HR2545	1/7 2/4 4/3 6/4 7/6 11/5 12/12 13/6 16/3 17/2 18/10 19/3 20/11
A4014	See A4004		
B4014	See B4004		
P4015	HD89890	HR4074	4/5 7/5 12/7 13/7 14/1 18/5 19/14 20/8 21/5
A4015	HD92287	HR4173	4/5 7/5 12/7 13/7 14/1 18/14 19/15 20/8 21/5
B4015	HD89569	HR4061	4/7 7/6 12/11 13/9 14/1 18/14 19/15 20/8 21/5
B4020	See A4015		
P5001	HD268835	R66	1/9 2/3 5/4 6/2 7/1
A5001	HD32762		1/9 2/2 5/4 6/2 7/1
B5001	HD31722		1/9 2/2 5/4 6/2 7/1
P5002	HD269006	R71	1/9 2/3 4/1 5/4 6/2 7/5 8/1 9/5 10/4 11/8 12/13 13/5 15/1 16/11 17/6 18/7 19/3 20/1 24/2
A5002	HD32858		1/9 2/3 4/1 5/4 6/2 7/5 8/1 9/5 10/5 11/8 12/14 13/5 15/1 16/11 17/6 18/7 19/3 20/1 24/2
B5002	HD33031		1/9 2/2 4/1 5/4 6/2 7/5 8/1 9/5 10/4 11/8 12/14 13/5 15/1 16/11 17/6 18/7 19/3 20/1 24/2
P5003	HD269128	R81	1/9 2/3 5/13 6/7 7/19 8/2 9/10 10/10 11/24 12/13 13/9 15/4 16/12 17/28 18/28 19/20 20/17 22/3 23/3 24/7
A5003	HD34144		1/9 2/3 5/13 6/7 7/19 8/2 9/11 10/10 11/24 12/13 13/9 15/4 16/12 17/28 18/28 19/20 20/17 22/3 23/3 24/7
B5003	HD34651		1/9 5/13 6/7 7/19 8/2 9/8 10/9 11/24 12/13 13/9 15/4 16/12 17/28 18/28 19/20 20/17 22/3 23/3 24/7
P5004	HD35343	S Dor	1/8 2/2 4/1 5/3 6/2 7/6 8/3 9/4 10/4 11/21 12/12 13/6 16/11 17/7 18/7 19/3 24/3
A5004	HD35293		1/8 2/2 4/1 5/3 6/2 7/6 8/3 9/5 10/4 11/21 12/12 13/6 16/11 17/11 18/15 19/7 24/5
B5004	HD35294		1/8 4/1 5/3 6/2 7/6 8/3 9/5 10/4 11/21 12/12 13/6 16/11 17/11 18/15 19/7 24/5
P5005	HD92207	HR4169	2/1 4/3 7/4 12/11 13/7 14/1 17/2 18/22 19/22 20/21 21/13
A5005	HD92421	GC14653	2/1 4/3 7/4 12/6 13/5 14/1 18/21 19/22 20/20 21/13
B5005	HD92399	GC14648	2/1 4/3 7/4 12/11 13/5 14/1 18/21 19/22 20/20 21/13
P5006	HD93308	HR4210	2/1 4/4 7/3 8/2 12/12 13/5 18/5 19/4 20/5 21/3
A5006	HD93010		2/2 4/4 7/3 8/10 12/12 13/5 18/11 19/8 20/8 21/7
B5006	HD93502	HR4217	2/2 4/4 7/3 8/9 12/11 13/5 18/11 19/8 20/8 21/7
P5007	HD94910	AG Car	2/2 4/4 7/3 8/3 12/12 13/5 18/5 19/4 20/5 21/4
A5007	See A5006		
B5007	See B5006		
P5008	HD100261	HR4441	2/1 4/2 7/3 12/10 13/5 14/1 18/18 19/22 20/21 21/12 22/6
A5008	HD100122	GC15798	2/1 4/2 7/3 12/10 13/5 14/1 18/18 19/22 20/21 21/12 22/6
B5008	HD100613	GC15866	2/1 4/2 7/3 12/10 13/5 14/1 18/18 19/22 20/21 21/11 22/6
P5010	HD152236	HR6262	1/9 4/6 5/11 6/10 8/3 9/8 10/1 13/10 14/2 16/15 19/18 20/14 21/13 22/18 23/6 24/6
A5010			1/9 4/6 5/11 6/10 8/3 9/9 10/1 13/10 14/2 16/15 19/18 20/13 21/13 22/18 23/6 24/6
B5010			1/9 4/6 5/11 6/10 8/2 9/8 10/1 13/10 14/2 16/15 19/18 20/14 21/13 22/18 23/6 24/6

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
P5011	HD160529		4/6 5/9 6/7 8/2 9/4 10/2 11/3 13/9 15/8 16/15 19/13 20/12 21/13 22/16 23/6 24/7
A5011	HD160461		4/6 5/9 6/7 8/2 9/4 10/2 11/3 13/9 15/8 16/15 19/13 20/13 21/13 22/16 23/6 24/7
B5011	HD160575		4/6 5/9 6/7 8/2 9/4 10/2 11/3 13/9 15/8 16/15 19/13 20/12 21/13 22/15 23/6 24/7
P5012	HD168607		4/5 5/7 6/2 8/1 9/5 10/3 11/3 13/2 14/3 15/7 16/14 19/2 21/12 22/13 23/4 24/6
A5012	HD168552		4/5 5/7 6/2 8/1 9/5 10/3 11/3 13/2 14/3 15/7 16/14 19/2 21/12 22/8 23/5 24/6
B5012	HD168896		4/5 5/7 6/2 8/1 9/4 10/3 11/2 13/2 14/3 15/7 16/14 19/2 21/12 22/8 23/5 24/6
P5013	HD168625		4/5 5/7 6/2 8/1 9/5 10/1 11/3 13/1 14/1 15/7 16/13 21/12 22/11 23/4 24/5
A5013	See A5012		
B5013	See B5012		
P5014	HD173819	HR7066	1/7 4/4 5/4 6/4 8/1 9/8 10/4 11/6 13/1 15/2 16/13 21/3 22/2 23/2 24/2
A5014			1/7 4/4 5/4 6/4 8/1 9/8 10/4 11/6 13/1 15/2 16/13 21/3 22/2 23/2 24/2
B5014			1/7 4/4 5/4 6/4 8/1 9/7 10/3 11/6 13/1 15/2 16/13 21/3 22/2 23/2 24/2
P5017			4/5 7/3 12/9 13/2
A5018	HD37722		1/12 2/3 4/5 5/3 6/2 7/6 8/2 9/9 10/6 11/10 12/9 13/6 16/8 17/9 18/12 19/6 20/3 24/6
B5018	HD37584		1/12 4/5 5/3 6/2 7/6 8/2 9/8 10/5 11/10 12/9 13/6 16/8 17/9 18/12 19/6 20/3 24/6
P5019	HD269321	R85	7/5 8/2 9/5 10/4 11/9 12/11 13/3 16/11 17/7 18/11 19/7 24/4
A5019	See A5004		
B5019	See B5004		
P5020	HD167971		13/15 14/3 15/6 16/14 19/3 21/13 22/15 23/2 24/7
A5020	HD168112		13/15 14/3 15/6 16/13 19/3 21/14 22/15 23/2 24/7
B5020	HD168135		13/15 14/2 15/6 16/14 19/3 21/12 22/15 23/2 24/7
P5021	HR Car		18/10 19/7 20/8 21/3
A5021	See A5006		
B5021	See B5006		
P5022	HD6884	R40	18/20 22/7 23/4 24/9
A5022	SAO255745		18/20 22/8 23/4 24/9
B5022	SAO255746		18/20 22/8 23/4 24/9
P5023	HD87643	SAO237672	18/15 19/11 20/10 21/6
A5023	HD87419	SAO237641	18/15 19/11 20/10 21/6
B5023	HD87470	SAO237649	18/15 19/11 20/10 21/6
P6001	Wray 977		4/6 8/3 9/4 12/5 13/3 18/2 19/11 20/8 21/4 22/4
A6001	HD108531		2/1 4/6 8/3 9/5 12/5 13/3 18/2 19/11 20/8 21/4 22/4
B6001			4/6 8/3 9/5 12/5 13/3 18/2 19/11 20/8 21/4 22/3
P6002	HD102567	Hen 715	2/1 4/4 7/3 8/2 9/2 12/7 13/3 18/7 19/12 20/9 21/5 22/2
A6002	HD102368	SAO251580	2/1 4/4 7/3 8/2 9/2 12/7 13/3 18/7 19/12 20/9 21/5 22/2
B6002	HD101070	SAO251491	8/1 13/3 18/7 19/12 20/9 21/5 22/2
P6003	MX0655−071		1/1 2/2 4/3 7/3 11/3 12/3 13/3 16/2 18/3 19/2 20/2
A6003	HD51758	SAO133969	1/1 2/2 4/3 7/3 11/3 12/3 13/3 16/2 18/3 19/2 20/2
B6003			1/1 2/2 4/3 7/3 11/3 12/3 13/3 16/2 18/3 19/2 20/2
P6004	HD8191		1/22 2/4 5/10 6/7 7/6
A6004	HD8096	SAO255758	1/23 2/4 5/10 6/7 7/6
B6004	HD8479	SAO255767	1/23 2/4 5/10 6/6 7/5
P6005	HD15527	SAO148420	1/21 2/4 5/7 6/7 7/6 8/2 9/3 11/6 12/7 15/6 16/12 17/7 18/7 19/6 22/4 23/3 24/4
A6005	HD15505	SAO148418	1/21 2/4 5/7 6/7 7/6 8/2 9/3 11/6 12/7 15/6 16/13 17/7 18/7 19/6 22/4 23/3 24/4
B6005	HD15554	SAO148422	1/20 2/4 5/7 6/7 7/6 8/2 9/3 11/6 12/7 15/6 16/13 17/7 18/7 19/6 22/4 23/3 24/4
P6006	SAO233120		1/22 2/3 5/6 6/7 7/6 8/1 9/7 10/7 11/10 12/14 14/1 15/5 16/13 17/11 18/15 19/11 22/4 23/3 24/5
A6006	HD21265	SAO233102	1/22 2/3 5/6 6/7 7/6 8/1 9/7 10/7 11/10 12/14 14/2 15/5 16/13 17/11 18/15 19/11 20/1 22/4 23/3 24/5
B6006	HD21081	SAO233083	1/22 2/3 5/6 6/7 7/6 8/1 9/7 10/7 11/10 12/14 14/2 15/5 16/13 17/11 18/15 19/11 20/1 22/4 23/3 24/5
P6007	HD24091		1/17 2/4 5/6 6/8 7/5
A6007	HD23917	SAO149178	1/17 2/4 5/6 6/8 7/5
B6007	HD23993	SAO149183	1/16 2/4 5/6 6/8 7/5
P6008	HD269339		1/9 2/1 5/3 6/3 7/6
A6008			1/9 2/2 5/3 6/3 7/6
B6008	HD33870	SAO249200	1/9 2/2 5/3 6/3 7/6
P6009			1/8 2/2 5/3 6/3 7/6
P6010	HD269200		1/8 2/2 5/4 6/2 7/4
A6010	HD36584	HR1859	1/8 2/2 5/4 6/2 7/4
P6011	Q101		1/8 2/2 5/3 6/2 7/4

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
A6011	HD40277	SAO256245	1/8 2/2 5/3 6/2 7/4
B6011			1/8 2/1 5/3 6/2 7/4
P6015	HD111487	SAO138983	4/6 8/1 9/1 12/4 13/3 19/17 20/10 21/3 22/3
A6015	HD111199	HR4856	4/6 8/1 9/2 12/4 13/3 19/17 20/10 21/3 22/3
B6015	HD111767	SAO139004	4/6 8/1 9/1 12/4 13/3 19/17 20/10 21/3 22/3
P6024	HD245770		19/14 20/7
A6024	HD37438	HR1928	19/16 20/7
B6024	HD37170	SAO77331	19/15 20/7
C6024	HD37751	SAO77412	19/12 20/7
P7001	HD50846	AU..	1/10 2/2
A7001	HD50747	HR2572	1/10 2/2
B7001	HD50820	HR2577	1/10 2/2
P7003	HD57593	HR2800	4/1 7/2 11/23 12/2 13/17 17/15 18/26 19/21 20/16 23/1
A7003	HD55857	HR2734	4/1 7/2 11/23 12/2 13/17 17/15 18/26 19/21 20/16 23/1
B7003	See A4005		
P7007	HD352	HR14	8/8 9/9 10/6 11/22 12/1 14/5 15/9 16/12 17/21 18/16 21/2 22/17 23/7 24/6
A7007	See P2001		
B7007	See B2001		
P7008	EW Scu		8/2 9/5 10/3 11/7 13/14 14/3 15/4 16/12 21/12 22/9 23/4 24/1
A7008	HD171610		8/2 9/5 10/4 11/7 13/14 14/3 15/5 16/11 21/12 22/9 23/4 24/1
B7008	HD172348		8/2 9/5 10/4 11/7 13/14 14/3 15/3 16/12 21/12 22/9 23/4 24/1
P7010	AP Vel		12/24 13/16 17/3 18/26 19/21 20/20 21/2
B7010	HD73524	HR3421	12/24 13/15 17/3 18/27 19/20 20/20 21/2
C7010	HD74042		13/16 17/3 18/27 19/21 20/20 21/2
P7011	BK Cen		12/23 13/15 18/14 19/19 20/19 21/11 22/4
A7011	HD102707		13/15 18/14 19/19 20/19 21/11 22/4
B7011	HR4634		12/22 13/15 18/14 19/19 20/19 21/11 22/4
C7011	HD102350	HR4522	12/23
P7014	See P9001		
A7014	See C9001		
B7014	See B9001		
P7015	HD127381	HR5425	13/9 14/2 16/15 19/20 20/19 21/13 22/17 23/5
A7015	HD130572		13/9 14/2 16/14 19/20 20/20 21/13 22/17 23/5
B7015	HD125721	HR5375	13/9 14/2 16/15 19/20 20/20 21/11 22/17 23/5
P7016	HD149711	HR6174	13/3 14/2 15/6 16/15 19/17 20/17 21/13 22/19 23/5
A7016	HD150591	HR6209	13/3 14/2 15/8 16/15 19/17 20/17 21/13 22/19 23/5
B7016	HD150742	HR6214	13/3 14/1 15/9 16/14 19/17 20/17 21/13 22/19 23/5
P7017	IRC−30023		19/2 22/1
A7017	HD16587	SAO167942	19/3 22/1
B7017	SAO167959		19/3
P7018	HD80383	SAO236814	18/1 19/8 20/6
P7019	HD147985		14/2 16/13 21/1
P7020	HD156662		14/1 15/2 16/14 21/1
P7021	HD129929		15/1 16/13
P7022	PU Vul		16/14 21/5 22/5
A7022	HD192712	SAO88417	16/13 21/5 22/5
B7022	HD351570	SAO105835	16/13 21/5 22/5
P7023	See P4001		
A7023	See B4001		
B7023	See P4001		
P7024	HD37490	HR1934	17/26 18/26
A7024	See B7023		
B7024	HD37744	HR1950	17/26 18/26
P7025	See P4005		
A7025	See A7003		
B7025	HD56342	HR2756	18/25
P7026	See P4006		
A7026	See A7003		
B7026	See B7025		
P7027	See P9009		

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
A7027	See A9009		
B7027	See B9009		
P7028	See P9010		
A7028	See A9010		
B7028	See B9010		
P7029	Y Mus		21/3 22/1
A7029	D Mus		21/3 22/1
B7029	F Mus		21/3 22/1
P7030	RS Tel		21/5
A7030	95 Tel		21/4
B7030	97 Tel		21/5
P7031	GU Sgr		21/2
A7031	D Sgr		21/2
B7031	B Sgr		21/2
P7032	HD173539	V Cra	21/2
A7032	D Cra		21/2
B7032	E Cra		21/2
P7033	U Aqr		22/2 24/7
A7033	106 Aqr		22/2 24/7
B7033	112 Aqr		22/2 24/7
P7034	HD208496	HR8369	21/11 23/12 24/12
A7034	HD207964	HR8352	21/11 23/12 24/12
P8001	HD131670		8/2 9/4 13/3 14/2 16/15 19/13 20/13 21/5 22/4
A8001	HD131530	HR5554	8/2 9/4 13/3 14/2 16/15 19/13 20/13 21/4 22/4
B8001	HD131918	HR5564	8/2 9/3 13/3 14/2 16/15 19/13 20/13 21/5 22/4
P8002	HD130255	BD+01.2980	8/2 9/2 13/3 14/2 16/12 19/14 20/20 21/5 22/4
A8002	HD130952	HR5535	8/2 9/2 13/3 14/3 16/12 19/14 20/20 21/5 22/4
B8002	HD130970	HR5536	8/2 9/2 13/3 14/2 16/11 19/14 20/20 21/4 22/4
P8003	HD139195	HR5802	13/3 14/1 16/13 19/6 20/9 21/4 22/5
A8003	HD140027	HR5840	13/3 14/1 16/11 19/6 20/9 21/4 22/5
B8003	HD140438	HR5850	13/3 14/1 16/12 19/6 20/9 21/3 22/5
P8004	HD178717		15/2 16/14 21/3 22/1
A8004	HD180242	HR7299	15/2 16/14 21/3 22/1
B8004	HD181122	HR7325	15/2 16/13 21/3 22/1
P8005	HD183915		8/1 9/2 10/2 11/2 15/2 16/14 21/2 22/2
A8005	HD183492	HR7407	8/1 9/2 10/2 11/2 15/2 16/14 21/2 22/2
B8005	HD184944	HR7449	8/1 9/2 10/2 11/2 15/2 16/14 21/2 22/2
P8006	HD204075	HR8204	15/1 16/13 21/4 22/6 23/3 24/3
A8006	HD204139	HR8207	15/1 16/13 21/4 22/6 23/3 24/3
B8006	HD204381	HR8213	15/2 16/12 21/4 22/6 23/3 24/3
P8007	HD223617		8/3 9/3 10/5 11/7 15/2 16/14 17/5 18/2 21/1 22/4 23/5 24/3
A8007	HD223252	HR9012	8/3 9/3 10/5 11/7 15/2 16/13 17/5 18/2 21/1 22/4 23/5 24/3
B8007	HD223807	HR9040	8/3 9/3 10/5 11/7 15/2 16/13 17/5 18/2 21/1 22/4 23/5 24/3
P8008	HD46407	HR2392	13/3 16/6 17/5 18/6 19/15 20/18
A8008	HD46184	HR2379	13/3 16/6 17/5 18/6 19/15 20/18
B8008	HD45976	HR2367	13/3 16/6 17/5 18/6 19/15 20/18
C8008	HD44951	HR2305	13/15 20/18
P8009	HD19014		15/2 18/4 22/2 24/4
A8009	HD18293	HR 872	15/2 18/4 22/2 24/4
B8009	HD15248	HR 715	15/2 18/4 22/2 24/4
P8010	HD58368		13/3 17/3 18/5 19/4 20/6
A8010	HD56989	HR2778	13/3 17/3 18/5 19/4 20/6
B8010	HD55184	HR2713	13/3 17/3 18/5 19/4 20/6
P8011	HD44896		13/3 16/7 17/4 18/6 19/13 20/10
A8011	HD44956	HR2307	13/3 16/7 17/4 18/6 19/13 20/10
B8011	HD45383	HR2329	13/3 16/7 17/3 18/6 19/13 20/10
P8012	HD60197		13/3 17/2 18/6 19/5 20/9
A8012	HD60666	HR2916	13/3 17/2 18/5 19/5 20/9
B8012	HD61409	HR2942	13/3 17/2 18/5 19/5 20/9
P8013	HD92626		13/3 18/4 19/5 20/11 21/2

TABLE 3. *(Continued)*

Code	Ident. 1	Ident. 2	Frequency of independent observations (run/number of observations)
A8013	HD90677	HR4107	13/3 18/4 19/5 20/11 21/2
B8013	HD91437	HR4139	13/3 18/4 19/5 20/11 21/2
P8014	HD31996	HR1607	19/1
A8014	HD31414	HR1579	17/8 23/3
B8014	HD30743	HR1545	17/8 23/3
P8016	HD20234	HR 977	17/8 23/6
A8016	HD19319	HR 934	17/8 23/6
B8016	HD19743	SAO248736	17/8 23/6
P8020	HD202874	HR8145	23/5
A8020	HD200334		23/5
B8020	HD202628		23/5
P8021	HD44984	HR2308	17/7
A8021	HD44867	HR2302	17/7
B8021	HD45506	HR2340	17/7
P8022	HD54361	W CMa	17/6
A8022	HD53907	SAO152386	17/6
B8022	HD55832	HR2732	17/6
P8028	HD223075	HR9004	17/7 23/5
A8028	HD223346	HR9015	17/7 23/5
B8028	HD223719	HR9033	17/7 23/5
P8029	HD180093	HR7296	15/2 16/14 21/4 22/7 23/7
A8029	HD180702	SAO211161	15/2 16/14 21/4 22/7 23/7
B8029	HD181321	HR7330	15/2 16/14 21/4 22/7 23/7
P8030	HD52432	SAO134049	17/7 18/10 19/7 20/6
A8030	HD50890	HR2582	17/7 18/10 19/7 20/6
B8030	HD52611	HR2636	17/7 18/10 19/7 20/6
P8031	HD75021	SAO176458	18/10 19/8 20/7
A8031	HD75022	SAO176457	18/10 19/8 20/7
B8031	HD75691	HR3518	18/10 19/8 20/7
P8032	HD182040	SAO162551	16/15 21/3 22/4 23/4
A8032	HD184492	HR7430	16/15 21/3 22/4 23/4
B8032	HD182038	HR7353	16/15 21/3 22/4 23/4
P8034	HD121447	SAO158240	19/8 20/10 21/3 22/2
A8034	HD121699	HR5246	19/8 20/10 21/2 22/2
B8034	HD117246	SAO157962	19/8 20/10 21/3 22/2
P8035	HD116713	HR5058	19/5 20/14 21/2 22/3
A8035	HD114873	HR4991	19/5 20/14 21/3 22/3
B8035	HD116835	HR5060	19/5 20/14 21/2 22/3
P8036	HD84678	COD−75.446	19/4 20/8
A8036	HD74543	SAO256536	19/4 20/8
B8036	HD100901	SAO256853	19/4 20/8
P8037	HD88562	SAO155816	19/7 20/10 21/2
A8037	HD87808	HR3977	19/7 20/11 21/2
B8037	HD89033	HR4034	19/7 20/11 21/2
P8039	HD154430	CPD−59.6905	19/5 20/8 21/2 23/3
A8039	HD155341	HR6384	19/5 20/8 21/2 23/3
B8039	HD152980	HR6295	19/5 20/8 21/1 23/3
P9001	HD96548	WR40	12/23
A9001	See C9001		
B9001	HD96287		12/23
C9001	HD96568	HR4326	12/23
P9009	HD86161	WR16	18/27 19/20 20/20 21/8
A9009	HD86000		18/27 19/20 20/20 21/8
B9009	HD85810		18/27 19/20 20/20 21/8
P9010	HD50896	HR2583	17/14 18/27 19/20 20/11
A9010	HD50853	HR2578	17/15 18/27 19/20 20/11
C9010			18/26 19/20 20/10

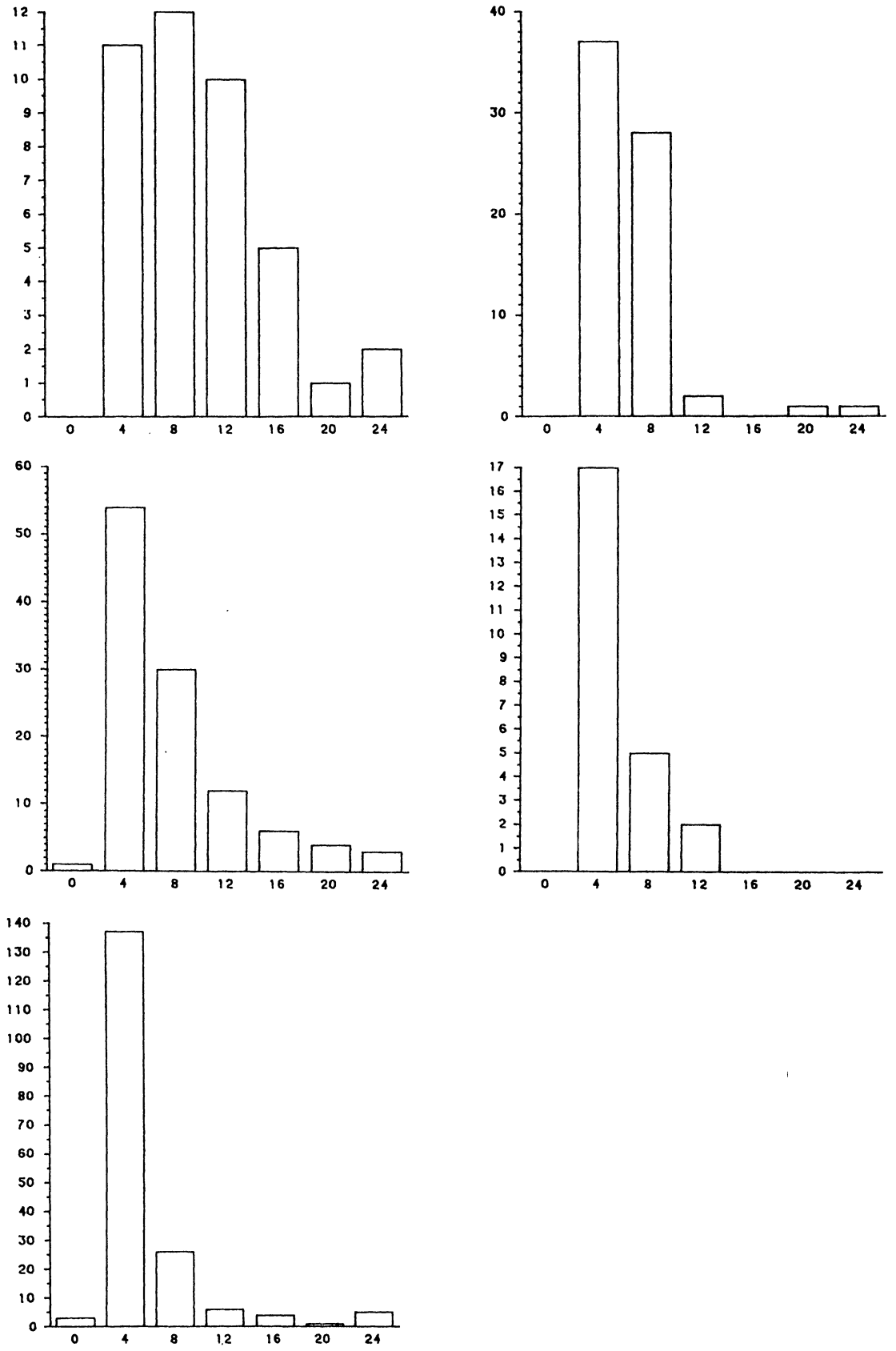

FIGURE 2a. Internal accuracy (in units of 0.001 mag) of the differential measurements obtained with each of the six instrumental systems in the y band. Top left: system 1. Top right: system 4. Center left: system 5. Center right: system 6. Bottom: system 7.

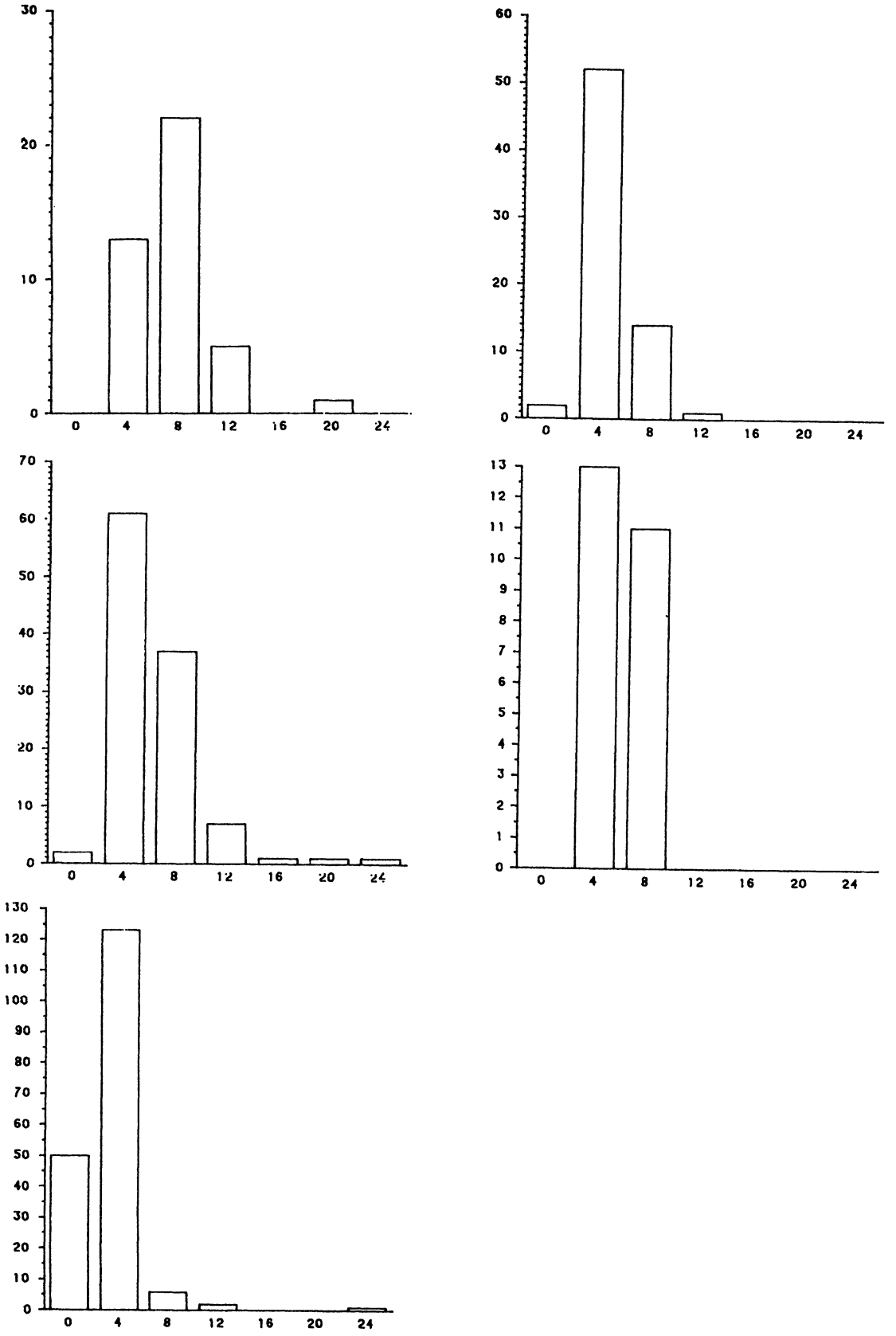

FIGURE 2b. Same as 2a for the $b - y$ index.

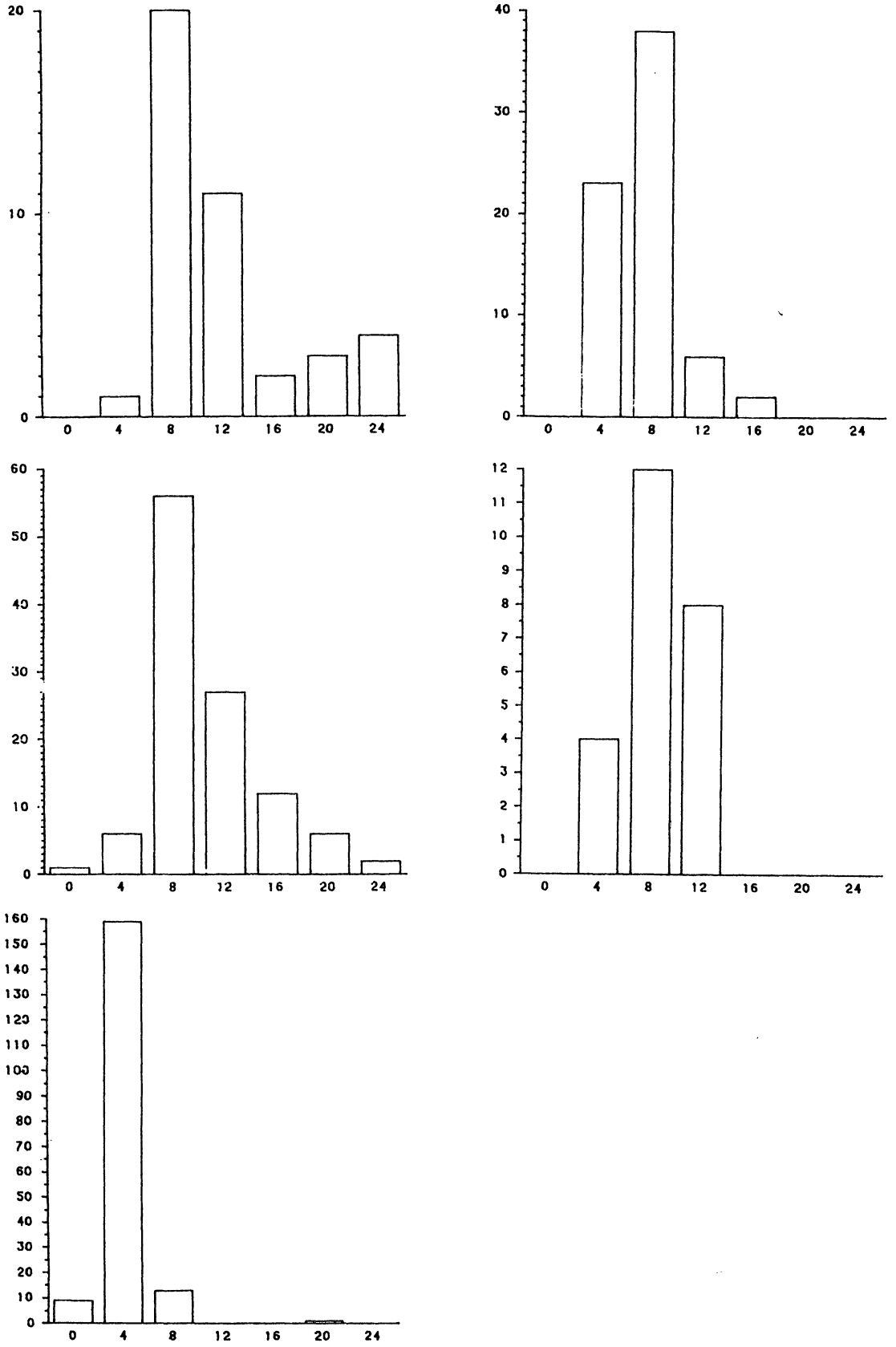

FIGURE 2c. Same as 2a for the m_1 index.

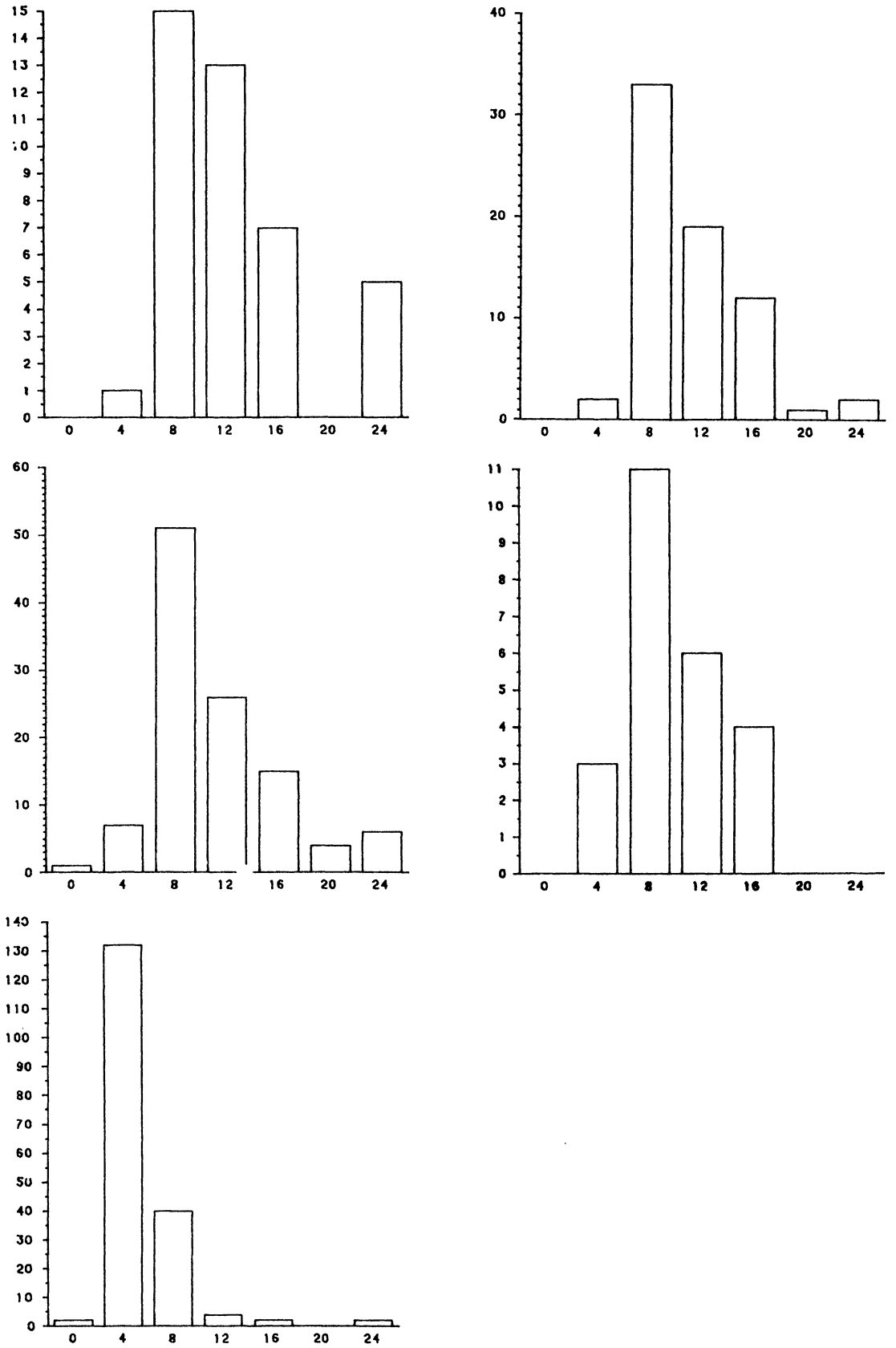

FIGURE 2d. Same as 2a for the c_1 index.