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VOLUME XI, PART XX,
RELATIVE PROPER MOTIONS OF LONG-PERIOD VARIABLE STARS,
HARLD L. ALDEN AND V. OSVALDS

VOLUME XI, PART XXI,
ABSOLUTE PROPER MOTIONS
SECULAR PARALLAXES, ABSOLUTE MAGNITUDES
AND SPACE VELOCITIES OF MIRA TYPE VARIABLES,
V. OSVALDS AND A. MARGUERITE RISLEY

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1961

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RELATIVE PROPER MOTIONS OF LONG-PERIOD VARIABLE STARS

HAROLD L. ALDEN AND V. OSVALDS

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Charlottesville, Virginia

Abstract. On the plates taken with the 26-inch McCormick visual refractor and with the 26-inch Yale Southern Station photographic refractor the relative positions of 366 Long-period variable stars have been measured and their relative proper motions derived. For 22 variables both McCormick and Yale plates were available and the motions were derived in duplicate. They served for combining the results.

Introduction.

Although Long-period variables with their large variation of brightness have been observed for over 350 years the statistical studies of their physical and kinematical properties are of very recent date. In 1928, when preparations for this investigation were made, very little was known about them, but, in the meantime, with the possibility that Mira variables form a link between Populations I and II, considerable interest has been attached to this problem. A number of researchers have investigated various characteristics of Mira variables, e.g., their apparent distribution on the celestial sphere (Ahnert, 1939), their spectra (Merrill, 1940), light curves and apparent magnitudes (Campbell, 1955), radial velocities (Merrill, 1941), distances (Oort and Van Tulder, 1942), absolute magnitude (Miczaika, 1946, a compilation of results); distances, absolute magnitudes, space velocities (Wilson and Merrill, 1942; Kulikovsky, 1948; Safronov, 1950). In many of these papers the lack of good proper motions has been emphasized.

In order to obtain good proper motions for any statistical study of Long-period variables, most of these stars known in 1928 and observable from here were put on the McCormick proper motion program for obtaining a set of first epoch photographs. A fairly uniform distribution down to -30° declination was sought. To improve the distribution further, the senior author (H. L. A.) cooperated in taking the plates for the southern variables while he was in charge of the Yale Southern Station in Johannesburg, South Africa.

The number of the known variables has increased substantially since 1928 and by now our sample, which includes most of the brighter Mira variables, makes up only one tenth of the known variables of this type. The number of variables being limited by the available first epoch plates, we have no other choice but to use this sample and hope that it is useful and satisfactorily represents the properties of the Mira variables as a whole.

PHOTOGRAPHIC MATERIAL.

McCormick plates

Some 450 longperiod variables had been chosen and the first epoch plates (size 12.7 x 20.3 cm) had been taken with the 26-inch visual refractor between November, 1928 and October, 1937. As time went on and more observations on their variability had been accumulated by variable star observers, many of them were found to be semiregular or irregular variables.

At the time of the second epoch 303 variables were ruled acceptable and plates of them were taken between October, 1949 and August, 1956. As a rule, a pair of plates with 2 exposures per plate was obtained of every variable at each epoch. At the first epoch the two plates were taken either on one piece of glass or on two separate pieces. At the second epoch they were invariably taken on one piece of glass reversed between two pairs of exposures, in order to minimize the effects of a possible film shift.

Although the actual selection of reference stars was performed later, their apparent mean magnitude was expected to be around 10.5 photovisual. In order to avoid a possible magnitude error in the position of the variable, the magnitude of the latter was reduced to 10.5 by means of a rotating sector.

Yale plates.

A total of 63 variables between $+30^\circ$ and -80° Declination had been photographed by the senior author (H. L. A.) at the Yale University Observatory Southern Station: the first epoch between May, 1929 and February, 1932 and the second from March, 1944 to April, 1945. The instrument used was the 26-inch photographic refractor with a coarse grating: 16.5 x 21.6 cm plates were used and 3 images per plate was a rule. A rotating sector was used to reduce the brightness of the variable to approximately 12th photographic magnitude.

Figure 1 shows the galactic distribution of the 345 variables for which the motions have been derived.

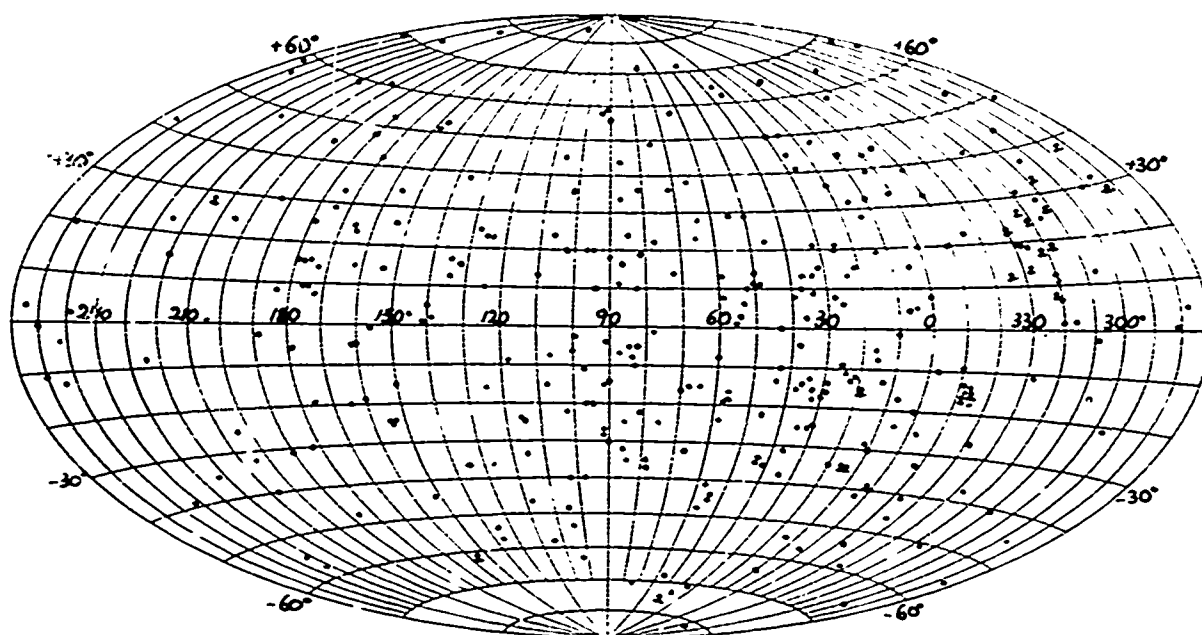


FIGURE 1. GALACTIC DISTRIBUTION OF MIRA VARIABLES ON THE MCCORMICK PROGRAM
The underlined dots represent the stars common to the McCormick and Yale sets.

MEASUREMENT AND REDUCTION OF PLATES

Reference stars: McCormick plates.

In order to minimize the chance of picking a star with a much larger than average proper motion as a comparison star, an effort had been made to select early spectral type stars. In higher galactic latitudes it was increasingly difficult. Therefore, whenever possible, at least stars with known spectra were selected. All McCormick regions were identified on our spectral plates taken with the 10-inch Cooke camera and the spectral type of the field stars classified.

Since the probable error caused by cosmical dispersion of the measured position of reference stars increases with increasing galactic latitude, more reference stars are needed for variables at higher galactic latitudes. An a priori computation by Dr. A. N. Vyssotsky based on statistical mean values and with an epoch difference of 20 years showed that an accuracy of $\pm 0''.004$ for the relative motion of a variable would be obtained by using the following number of reference stars:

At galactic latitudes	No. of reference stars:
0° to $\pm 20^\circ$	4
$\pm 21^\circ$ to $\pm 40^\circ$	10
$\pm 41^\circ$ to $\pm 90^\circ$	16

In selecting the reference stars the following rules were observed as closely as possible:

- select stars of early type or at least with known spectra
- select 4, 8 or 12 stars distributed symmetrically in all four quadrants for the variables within the galactic latitudes 0° to $\pm 20^\circ$, $\pm 21^\circ$ to $\pm 40^\circ$, $\pm 41^\circ$ to $\pm 90^\circ$ respectively.
- the mean magnitude of the reference stars should be the same as the mean magnitude of the variable from all the plates.

Yale plates.

For the Yale plates the general rules were the same, except that at the time of the selection of reference stars their spectra were neither known nor anticipated. It was only later that we were lucky to obtain spectra for about 60% of the Yale comparison stars. So, rule a/ could not be observed and c/ was deliberately not followed, but fainter stars were selected in order to keep low the chance of picking stars with large proper motions for reference.

Measuring of plates.

All the plates were measured on either a direct microscope Gaertner long screw machine or on a

projection machine of very similar model. Screw errors and the errors of the V-way of these two machines were not applied since they are the same for the measurements at both epochs.

The plates were oriented to the equator of 1900.0 by the usual expression

$$\Delta\theta = -0.0056 \sin\alpha \sec\delta (t_{\text{obs}} - t_{1900})$$

The scale of the McCormick plates is 1 mm = 20'.75, of the Yale plates 1 mm = 18'.82.

Reduction of the measurements.

For obtaining the relative proper motions of the variables the method of combining the coefficients was used. This is more convenient than a least squares solution and gives comparable accuracy. A number of persons participated in measuring and reducing the plates. In the summary of the participants and their contributions (see the following list) the word region means "a field around a variable star photographed at two epochs, one pair of plates at each epoch."

McCormick Plates

Name	Number of regions Measured	Reduced
Mrs. Z. Osvalds	106	147
Miss F. Dale	55	4
Mrs. M. Martin	41	0
Miss P. V. Ashwell	37	39
B. J. Spenceley	23	0
Mrs. Ch. Yates	15	21
J. Vining	14	0
Miss J. McNutt	7	0
A. S. Nist	3	0
J. A. Winfrey	3	1
H. L. Alden	0	82
V. Osvalds	0	10
Total	304	304

Yale Plates

Mrs. Z. Osvalds	62	62
B. J. Spenceley	1	0
H. L. Alden	0	1
Total	63	63

The means of the measurements and the work sheets of computation of the relative proper motion have been microfilmed and could be duplicated if needed.

THE PROPER MOTION CATALOGUE

The catalogue contains the relative motions of 304 stars on McCormick plates and of 63 on Yale plates. Of these stars 22 are common, and both

McCormick and Yale proper motions are given. All Yale motions are designated by a letter (Y) on the second line in the regions concerned. Two stars: Z Aurigae and SS Cygni, although not used in the discussion, are included in this catalogue, simply because their motions had been measured.

The catalogue contains the relative proper motions of 345 variables and their reference stars and the corrections which reduce the relative motions to the absolute FK₃ system.

The arrangement of the catalogue is this: the variables are in the sequence of their right ascension for 1900. Each page is divided into three columns and the regions of the variables run vertically. At the top of each column the headings refer to data beginning with the 4th line in each region. The headings are:

No. — the serial number for reference stars.

V — the variable.

x, y — the rectangular coordinates in R.A. and Decl. referred to the mean of the reference stars; in millimeters.

μ_α , μ_δ — the relative annual proper motions in units of 0".001.

m — for the reference stars: the photovisual magnitude; for the variable: the mean of the magnitudes derived from all the plates.

Sp — spectrum

Frequently the magnitude of the variable has been reduced by the rotating sector to match the mean magnitude of all the reference stars. For more detailed information on magnitudes and spectra see section "Reduction of Relative Motions to Absolute" in the following paper.

The spectra of the variables were taken, whenever available, from the General Catalogue of Variable Stars (Russian) 2nd ed., (1958). For many of the variables the range in spectral type has been given.

For the following variables the spectra were determined on the McCormick spectral plates: RV Cep, 7 Cep, RR Cep, R Lup and SZ And by V. Osvalds; ST Gem and UZ Cep by Dr. A. N. Vyssotsky, and for RS Leo it was kindly communicated by Dr. P. C. Keenan in a letter.

Spectra of reference stars were determined on either McCormick or Harvard spectral plates (see details in the section, "Reduction of Relative Motions to Absolute" by Osvalds and Risley). As usual, a colon after the spectral type indicates a less reliable determination. Even less dependable are spectra given in small letters. The classification of the latter has been based on the general intensity distribution of the continuum rather than on specific spectral lines.

The first three lines of each region refer to the variable only.

The first line gives the name, the period in days, the type, and the range of magnitude (photographic blue magnitudes are underlined). All these data are from the General Catalogue of Variable Stars.

The second line: R.A. and Decl. (1900) from the General Catalogue of Variable Stars and galactic longitude and latitude taken from Ohlsson's Tables (1932).

The third line gives the correction to be applied to the relative proper motion for obtaining the absolute proper motion in R.A. and Decl. The derivation of these corrections has been described by Osvalds and Risley in the section mentioned above.

In several regions with only a few reference stars, it happens that a reference star has a large proper motion. Such a star has been excluded from computing the mean position of reference stars and the plate constants.

The coordinates and the relative motion of such a star have been referred to the means of the rest of the reference stars. Such cases are indicated by putting the coordinates and the components of motion in parenthesis. However, the relative motion of the variable has been referred to the mean motion of all the reference stars.

The regions involved are: X Cet, RR Boo, RS Dra, RR Aqr, R Aqr, W Cet.

Acknowledgements.

The first epoch plates of the McCormick part were obtained by various observers under the guidance of the late Dr. S. A. Mitchell, then the Director of this Observatory. The authors are deeply grateful to Dr. D. Brouwer, the Director of the Yale University Observatory, for letting them use the plates of the Yale Southern Station. They

also gratefully acknowledge the work of Mrs. Zenta Osvalds who measured 46% and reduced 57% of the plates, and the help of the other persons who at one time or another participated in the measurement and reduction. Dr. Vyssotsky's a priori computations on the attainable accuracy were useful guides in the selection of the reference stars. The printer's copy of the catalogue was typed by Miss Janet E. Campbell and the remainder by Miss Margaret A. Kerr.

This research was made possible through a grant kindly given to this Observatory by the Office of Naval Research (Contract No. 982700). The printing costs have been paid from the McCormick Fund.

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THE CATALOGUE OF PROPER MOTIONS

follows on pages 115-145

with explanations on pages 113 and 114.

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	
TT Peg 153 SRA 9 3-11.2							T And 280 M 7.7-14.1							S Cet 320 M 7 6-14 7							
	00 ^h 01 ^m 14		-26° 32'		79° -35'			00 ^h 11 ^m 22		-26° 27'		84° -35'			00 ^h 19 ^m 00		-09° 53'		74° -71'		
			-10 - 5							-13 - 8			M3e				-16 - 9			M3e	
V	+ 1.3	+ 0.9	- 5	- 2	9.4	M6e	V	- 0.4	- 3.9	-21	-21	9.4	M4e	V	-23.6	- 4.3	-11	-16	10.8	M4e	
1	-68.9	-38.8	- 3	+ 7	12.4	K0:	1	-57.1	-16.4	-17	+ 8	10.8	F2	1	-78.6	-12.6	+15	-26	8.2	K2	
2	-60.5	-45.3	- 9	-20	10.2	K5	2	-53.6	-41.8	-15	-11	10.2	F8:	2	-76.9	+ 4.4	-15	-19	8.7	K5	
3	- 5.6	-19.5	- 3	- 3	11.2	G0	3	-19.3	-45.8	-19	-10	10.7	F8	3	-57.5	-44.5	-60	- 7	12.4	G5	
4	- 4.6	-14.2	- 9	-16	10.0	K0	4	-14.7	-24.6	-21	-13	12.2	..	4	-35.0	-27.5	-28	- 5	10.2	G5	
5	- 6.6	-38.4	- 5	- 4	11.7	G5	5	- 6.7	-34.2	-28	-34	11.2	G0:	5	-26.6	-17.3	-73	-17	11.5	G:	
6	-28.8	-13.8	-15	- 1	12.3	...	6	-36.3	-19.3	-64	-36	10.8	K0:	6	-13.1	-32.2	-15	- 2	9.9	F5	
7	-49.5	-11.9	- 5	0	11.7	G0	7	-53.3	-44.9	- 3	-11	9.9	G0	7	-29.3	-47.7	- 6	+ 8	11.9	...	
8	-54.8	-35.5	-15	- 5	11.8	A:	8	-58.4	-13.0	-33	-13	10.2	G0	8	-36.7	-47.8	-16	- 5	11.6	...	
							T Cas 445 M 7 3-12 4														
								00 ^h 17 ^m 18		-35° 14'		87° - 7'									
										- 7 - 3			M6e	YZ And 208 M 11.0-15.5							
							V	+ 5.6	+10.6	-22	- 5	10.9	M8e	00 ^h 22 ^m 00		-30° 21'		85° -32'			
							1	-54.3	-32.6	- 6	+ 2	10.5	A2								-15 - 9
							2	-46.5	-22.5	- 1	- 2	10.3	A0								
							3	-42.6	-47.9	- 4	+ 2	10.1	A0								
							4	- 3.2	-37.1	- 9	- 1	10.9	K0	V	+ 0.2	- 1.3	- 1	- 1	10.4	M5e	
							5	-18.9	-33.1	- 2	- 4	11.0	K	1	-67.3	- 3.6	-11	-10	9.8	K0	
							6	-27.7	-47.9	- 1	- 1	10.3	A0	2	-50.2	-26.8	-33	-19	10.2	G0	
							7	-48.8	-29.4	- 4	0	10.8	K2	3	-16.2	-56.5	-12	-16	10.5	G0	
							8	-51.4	-43.5	- 6	- 3	11.1	..	4	-10.2	-10.1	-35	+ 8	9.4	A5	
							S Tuc 240 M 8 2-15.0							5	-12.3	-53.9	-15	-15	9.8	G5	
							(Y)	00 ^h 18 ^m 4		-62° 14'		274° -55'		6	-32.9	-23.5	-25	-26	10.3	G0	
										-15 - 3				7	-33.4	-32.4	-14	-12	10.6	F8	
							V	+ 5.5	+ 1.4	-15	+ 4	10.5	M5e	8	-65.1	-39.7	-24	- 1	10.7	G:	
							1	-74.5	-23.2	- 4	-71	10.8	G:	Y Cep 333 M 8 1-16 0							
							2	-63.4	-14.8	-16	-27	10.2	G5	00 ^h 31 ^m 3		-79° 48'		90° -18'			
							3	-57.2	-55.6	- 6	-14	10.9	G								- 7 - 2
							4	-54.3	-55.7	-10	- 4	11.8	A	V	-18.0	- 4.0	- 7	-10	10.3	M5e	
							5	-44.9	-56.9	-12	+ 2	10.5	G5								M6e
							6	-43.1	- 8.0	- 4	-25	11.3	A2	1	-63.7	-35.3	-11	- 6	9.7	A2	
							7	-21.5	-17.3	-17	- 8	10.8	G5	2	-60.5	-47.2	- 7	0	11.7	...	
							8	-38.0	-66.3	- 4	-18	11.6	..	3	-24.0	-20.0	- 3	-10	10.7	G0	
							9	-56.1	-51.1	-12	-24	10.9	G	4	-12.7	-30.7	-14	- 5	10.3	A2	
							10	-61.4	-11.1	-34	-10	10.7	G0	5	-16.9	-34.0	- 1	-12	11.7	G:	
							11	-79.3	-41.4	-16	-20	11.1	G5	6	-32.7	- 6.9	0	- 7	11.4	A2	
							12	-81.1	-60.7	- 6	- 7	11.8	..	7	-42.8	-34.8	- 7	- 3	10.0	K5	
							R And 409 M 6 1-14 9							8	-66.6	-25.3	- 6	- 7	11.1	A5	
								00 ^h 18 ^m 8		-38° 01'		85° -24'		U Cas 210 M 8 0-15 4							
										-12 - 7				00 ^h 40 ^m 8		-47° 42'		90° -14'			
							V	- 0.4	- 2.3	-16	-32	11.8	S5 6e				- 7 - 4				
							1	-47.4	-10.6	- 7	- 1	10.4	K5	V	- 0.9	- 6.8	-14	- 2	10.4	S5 6e	
							2	-45.4	-31.5	- 5	- 6	10.1	G5	1	-66.5	- 3.0	-12	- 4	9.9	K0	
							3	-29.6	-20.0	- 4	- 2	10.6	A2	2	-51.8	-43.8	- 5	+ 3	10.5	A0	
							4	-17.1	- 2.7	- 8	- 3	9.7	A2	3	-11.5	-24.1	- 1	0	9.8	A2	
							5	-12.0	-29.6	-14	+ 8	11.0	..	4	- 8.2	-45.8	-21	+ 8	10.2	..	
							6	-16.9	-23.1	-11	- 1	11.6	..	5	- 6.7	- 9.9	- 9	- 1	9.9	A0	
							7	-31.0	-24.4	- 1	- 5	11.2	G0	6	-14.3	-10.2	-34	-15	9.9	K0	
							8	-59.6	-52.3	- 4	- 2	8.8	F0	7	-50.9	-31.7	+ 4	+ 3	11.1	A2	
														8	-66.1	-50.4	-29	-11	10.5	B8	

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
RW And 328 M 7.9-15.4							W Cas 405 M 8.2-12.4							S Cas 612 M 7.9-15.2						
00 ^h 47 ^m -32° 08' 90° -30'							00 ^h 49 ^m -58° 01' 91° -4'							01 ^h 12 ^m -72° 05' 93° -10'						
+13 -8							-5 -3							+8 -4						
M5e							M1e							M1e						
V	-2.8	-15.1	-2	-1	10.5	M5e	V	+23.1	-11.7	-7	-4	10.6	Ce	V	+1.4	-8.0	-6	-8	9.8	S4.6e
1	-68.1	-30.8	0	+5	10.7	F8	1	-57.0	-42.2	-5	+3	10.3	A2	1	-61.1	-26.6	-6	-14	10.5	A5
2	-42.8	-17.0	+17	+8	11.5	A0	2	-43.9	-31.3	+5	-3	10.5	A1	2	-34.4	-22.7	-1	-20	9.6	G5
3	-37.8	-9.4	-45	-16	10.0	F8	3	+43.9	+43.0	-5	+3	11.0	A1	3	-22.4	+11.6	-8	-1	10.3	...
4	-14.5	-22.5	+45	-10	11.3	F8	4	-57.0	-32.0	+5	-3	10.5	A5	4	-8.3	+29.2	+1	-5	10.3	A5
5	-21.6	+45.2	-91	+27	11.2	...	Z Cet 185 M 8.4-14.2						5	-15.8	-5.6	-4	-3	10.1	A5	
6	-30.2	-52.6	-62	-25	9.2	K5	01 ^h 01 ^m -02° 01' 101° -63'						6	+21.1	-30.9	-4	-3	10.8	A5	
7	-38.7	-11.0	-73	+9	10.5	K0	-15 -9						7	+43.1	-30.3	-11	-9	10.6	...	
8	-17.7	-29.0	-11	+2	10.9	G5	M1e						8	-56.2	-26.5	-3	-2	11.3	...	
M2e							M1e							S Psc 405 M 8.2-15.3						
9.0-15.2							V	-23.8	-10.4	-33	-11	10.5	M1e	01 ^h 12 ^m -08° 24' 103° -53'						
+47 -35° 07' 91° -27'							1	-76.5	-1.6	-19	-9	11.5	...	-14 -10						
-13 -8							2	-53.4	-10.1	-28	-1	9.8	K2	M7e						
M3e							3	-27.9	-33.4	-9	-10	12.1	...	V -9.4 -5.8 -15 -11 10.6						
V	-3.2	-5.9	-13	-2	10.6	M3e	4	+4.8	+7.6	+8	-4	9.3	A5	1	-65.6	-25.8	-1	-14	10.5	...
1	-65.7	+21.2	-2	+7	8.6	K2	5	+28.4	+36.1	-28	+13	10.9	G1	2	-29.3	-28.3	-28	-1	10.6	...
2	-49.4	+24.6	-18	-13	11.5	F5	6	-37.3	-24.8	-19	-6	10.0	K1	3	-20.3	-42.1	-1	-1	11.7	...
3	-18.0	-30.6	+3	-5	9.4	G0	7	-39.0	+21.8	-9	-16	10.4	G5	4	-4.6	-1.5	-24	-17	9.6	F5
4	-14.1	-51.0	+17	+1	11.4	G5	8	-48.3	-15.8	-9	-5	10.8	K1	5	-14.0	-29.9	-3	+2	11.8	G0
5	+14.0	-11.1	-41	-5	10.0	F8	X Psc 352 M 8.5-14						6	-30.5	-27.8	-25	-2	10.5	G0	
6	+43.1	-19.5	+4	-4	10.5	K0	01 ^h 06 ^m -21° 42' 98° -40'						7	-30.0	-29.7	-36	-3	11.3	...	
7	+45.2	-12.0	+21	-1	11.2	K2	-11 -8						8	-45.4	-21.3	-3	-13	11.8	G1	
8	-44.8	+39.6	+16	-10	9.7	A2	V	+3.9	-14.9	-10	-4	10.7	M6e	U Psc 173 M 10.3-14.9						
RR And 328 M 8.4-15.6							1	-43.1	-0.1	-5	-1	10.8	K0	01 ^h 17 ^m -12° 21' 164° -49'						
00 ^h 46 ^m -33° 50' 91° -28'							2	-15.4	-44.7	-5	-1	10.4	K0	-13 -9						
-11 -7							3	-14.7	-44.4	-5	-1	11.2	F8	V -4.7 -4.1 -7 -8 11.1						
M5e							4	-43.9	+0.2	-5	-1	11.4	G0	1	-65.1	-11.1	-3	-11	11.0	K0
V	+18.5	-2.3	-12	-9	5.6	S7.2e	U And 347 M 9.3-15.3						2	-53.1	33.1	-1	-4	12.0	...	
1	-43.7	-53.9	-28	-12	10.0	M5	01 ^h 09 ^m -40° 11' 96° -20'						3	-28.9	-41.1	-29	-5	11.2	K2	
2	-35.7	-21.9	-3	-4	11.7	...	-12 -8						4	-27.1	-39.9	-7	-12	9.3	K0	
3	-34.9	-6.1	-6	-5	11.7	...	V	-1.6	-5.2	-46	-5	10.4	M6e	5	-20.7	-30.2	-1	-1	11.8	K0
4	-26.9	-28.4	-24	+21	11.7	...	1	-51.5	-18.3	-80	+27	11.0	F5	6	-11.1	-36.7	-25	-21	8.9	K0
5	+6.8	-53.4	-5	+5	10.5	F5	2	-21.9	-36.2	+13	-3	10.9	K5	7	-4.4	-33.4	+19	-2	11.4	F8
6	-7.6	+45.2	-33	-24	11.8	...	3	-13.7	-37.9	-93	-25	11.0	K5	8	-14.6	-41.8	-4	-1	9.5	K0
7	-53.5	-25.2	-12	-7	11.2	A5	4	+5.6	+30.6	+9	-3	10.8	K0	9	-19.3	+11.2	-13	-16	11.2	K0
8	-73.2	-26.8	-16	-22	9.6	K5	5	-39.6	-47.0	-13	-3	9.6	A5	10	-31.2	-3.5	-2	-6	12.6	...
RV Cas 331 M 7.6-15.5							6	-41.9	-36.4	-22	+6	10.5	M	11	-65.0	+44.9	-9	-5	12.0	...
00 ^h 47 ^m -46° 52' 91° -15'							UZ And 314 M 9.1-15.6						12	-71.6	-10.2	-26	-30	11.3	K0	
-10 -6							-9 -6						RX Psc 280 M 8.6-14.6							
M6e							V	+1.7	+9.0	+8	+7	11.3	M7e	01 ^h 20 ^m -20° 52' 102° -40'						
V	-11.4	+16.7	+3	-3	10.3	M7e	1	-60.2	-17.0	-12	-6	11.1	F8	V	-4.7	-1.6	-12	0	10.5	M1e
1	-70.1	-40.6	+11	-4	10.6	F2	2	-58.1	-6.3	-2	-1	11.0	A5	1	-61.9	-21.0	-6	-1	10.9	G0
2	-38.8	-29.2	-4	-4	10.0	F0	3	-25.9	-39.5	+23	+7	10.8	G0	2	-32.6	-2.0	-2	-4	10.3	K0
3	-20.0	-31.6	+1	+1	10.8	M0	4	-10.7	-38.0	-6	0	10.9	K2	3	-30.9	+30.0	-28	0	10.0	F5
4	-12.6	+26.3	-8	-1	10.5	M0	5	-27.8	+11.6	-25	-39	11.0	K2	4	-15.6	-47.5	-23	-4	10.4	K0
5	-24.2	-37.8	-14	-2	10.1	F2	6	-33.4	-21.0	+4	-1	10.7	A5	5	-22.6	-4.9	-10	-14	10.3	K0
6	-34.1	-15.9	+2	-5	10.5	G5	7	+46.0	-27.2	+14	-38	11.2	...	6	-29.7	-33.6	-23	-10	10.5	G0
7	-34.9	-33.8	-30	-5	10.7	K0	8	-47.7	-30.0	+6	+3	11.6	...	7	-38.7	-33.3	-30	-13	11.2	G0
8	-48.3	-36.6	-18	-8	10.1	F2							8	-50.1	-10.6	-3	-9	10.5	F2	

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
RZ Per 354 M 8.7-14.0							X Cas 423 M 9.7-13.2							W And 397 M 6.7-14.5						
	01 ^h 23.6 ^m	-50° 20'			97*	-11*		01 ^h 49.8 ^m	-58° 46'			99* - 2*		02 ^h 11.2 ^m	-43° 51'			107* -15*		
		+ 5 - 3							+ 5 - 4						+ 6 - 6			M7e		
																		M8e		
V	-11.2	- 2.4	+ 1 - 1		10.4	S4.9e	V	- 3.0	- 3.0	- 3 - 2		9.6	Ne	V	+ 3.4	+ 6.9	+ 1 - 4		10.0	(S)
1	-59.4	-49.0	+ 1 - 2		11.1	K9:	1	-39.0	-19.6	-10 - 7		10.1	A2	1	-33.7	- 4.5	- 6 - 4		10.1	A2
2	-50.5	-42.8	- 2 - 5		10.3	A2	2	-39.3	-43.0	- 5 - 4		9.7	A0	2	-31.1	-29.6	- 3 - 0		9.2	A0
3	-17.5	-45.8	0 - 1		10.6	A0	3	-30.5	-31.3	-18 -13		10.5	F0	3	-19.4	-25.7	- 6 - 3		9.8	M0
4	- 5.8	- 8.1	- 2 - 3		10.9	A:	4	- 8.1	-22.1	- 2 - 3		10.3	A0	4	-14.0	-54.9	- 4 - 3		9.0	A0
5	-10.4	- 2.8	- 3 - 1		10.6	A0	5	-13.4	- 9.4	- 2 - 5		10.6	A2	5	- 2.1	-26.3	-11 - 5		10.2	A5
6	-11.2	-32.9	- 4 - 0		10.6	K0	6	-25.3	-19.6	- 5 - 9		9.7	A0	6	+ 6.0	-19.0	- 2 - 4		10.7	K2
7	-55.3	-41.1	+ 1 - 4		10.7	G5	7	-29.4	-40.1	- 9 - 0		10.6	A0	7	-6.6	-14.6	- 1 - 1		10.7	A0
8	-56.3	-39.8	- 6 - 3		11.6	A0	8	-48.8	-15.7	- 2 - 2		10.7	A0	8	-48.3	+ 5.6	- 1 - 3		9.9	A0
R Psc 344 M 7.1-11.8							U Per 321 M 7.5-11.7							Z Cep 278 M 10.2-15.7						
	01 ^h 25.5 ^m	- 2° 22'			112*	-58*		01 ^h 52.9 ^m	-54° 20'			100* - 6*		02 ^h 12.7 ^m	-81° 13'			94* -20*		
		-13 - 8							+ 5 - 4						+ 8 - 6					
V	- 7.8	- 9.6	- 2 - 6		10.1	M3e	V	- 1.7	- 8.0	-26 - 5		10.2	M7e	V	- 1.3	+ 2.2	- 1 - 4		11.0	M2e
1	-51.7	-18.7	0 - 4		10.6	...	1	-70.1	-37.5	- 5 - 5		10.2	A0	1	-61.9	-24.2	- 8 - 6		11.0	K0
2	-49.5	-29.9	-15 -14		10.3	F8	2	-50.0	-19.5	-12 -16		10.2	A2	2	-35.4	- 9.5	- 7 -16		10.8	F8
3	-46.6	-29.8	- 5 - 1		10.2	K0	3	-27.0	-31.6	- 6 - 9		10.0	A0	3	-24.6	-20.4	- 3 - 2		10.3	K0
4	-41.3	-27.5	- 7 - 5		12.4	...	4	-25.6	-40.3	- 1 - 2		9.9	A0	4	-22.9	-46.3	-17 -13		11.7	K0
5	-32.6	-52.3	-12 - 3		11.2	...	5	-27.0	-50.9	- 6 - 6		9.9	B8	5	- 3.5	-40.3	-12 - 3		11.8	F8
6	-20.6	21.0	+ 1 - 2		12.0	...	6	-33.6	-43.1	- 9 - 2		10.5	A0	6	-26.6	-15.2	-15 - 7		10.5	G0
7	-13.0	7.9	- 8 -10		11.6	...	7	-50.9	-41.4	- 3 - 5		10.8	A5	7	-51.3	-22.7	- 1 - 0		12.0	G:
8	-32.8	- 8.8	- 6 - 7		9.2	K2	8	-61.4	- 7.2	0 - 1		9.5	A0	8	-63.4	-35.6	- 4 - 3		10.8	A0:
9	-36.4	- 6.6	- 2 - 6		11.8	...	S Ar. 292 M 9.8-15.5							c Cet 332 M 2.0-10.1						
10	-50.9	-20.0	-30 - 9		11.4	K:		01 ^h 59.3 ^m	-12° 03'			118* -46*		02 ^h 14.3 ^m	- 3° 26'			137* -57*		
11	-53.6	-40.2	- 1 - 6		11.1	G0			-12 - 9						-12 - 8					
12	-55.0	-34.1	-20 -12		11.2	F8														
RU And 233 SRa 9.9-14.5							V - 1.5 - 9.9 -11 - 2 11.6 M4e							V -18.7 - 7.2 - 7 -211 10.2 M9e						
	01 ^h 32.8 ^m	-38° 10'			101*	-23*	1	-79.0	-15.6	- 7 -23		10.5	K0	1	-44.7	-11.9	-19 -90		11.5	...
		+10 - 7					2	-67.2	-25.5	-17 -35		11.6	K0	2	-44.0	-39.9	-59 -29		9.6	G0
							3	-66.0	-44.9	-36 -12		10.6	K0	3	-42.0	-31.4	-32 - 7		11.3	K0
V	- 1.1	-20.1	-14 -11		10.8	M5e	4	-33.3	- 6.5	- 4 -12		11.1	K0	4	-31.0	-23.0	+ 2 -25		11.7	...
1	-54.1	-25.2	-10 -12		11.4	G0:	5	-13.2	-21.8	- 5 -10		10.8	K2	5	-15.4	-42.0	- 8 -40		11.0	K:
2	-39.8	-11.6	- 1 - 2		10.0	K0	6	-11.2	- 2.4	- 8 - 1		11.6	G0	6	-19.9	-44.6	- 4 -31		10.3	K0
3	-36.9	-17.3	- 2 - 7		11.3	K:	7	- 2.0	-46.9	-18 - 3		9.6	F5	7	-24.5	- 8.7	- 7 - 8		9.6	K0
4	- 5.5	-16.7	-10 -17		10.6	A5	8	-48.4	-30.7	-15 - 9		12.2	G	8	-27.3	-23.4	-31 - 9		11.9	G:
5	- 3.8	- 7.1	- 7 - 4		11.1	A5	9	-50.6	-29.3	- 7 - 2		12.0	...	9	-48.4	-38.9	-13 -15		10.5	F8
6	-39.9	-30.1	- 3 - 9		10.2	K2	10	-51.2	-15.3	-16 - 4		11.6	F5:	10	-57.3	-25.9	- 7 - 1		11.6	A5
7	-45.2	-48.1	-18 - 6		10.7	K0	11	-36.4	-41.7	-14 -26		12.2	G							
8	-47.4	-27.9	- 8 - 1		10.5	K5	12	-65.3	-13.1	-25 -41		11.8	G0							
Y And 220 M 8.2-15.1							R Ari 187 M 7.5-13.7							R Cet 166 M 7.2-14						
	01 ^h 33.8 ^m	-38° 50'			101*	-22*		02 ^h 10.4 ^m	-24° 36'			114* -33*		02 ^h 20.9 ^m	-00° 38'			135* -54*		
		+ 9 - 7							+ 9 - 8						+11 - 8					
V	-16.8	- 7.5	-14 - 6		10.2	M4e	V	- 6.8	- 6.8	-14 - 4		10.8	M3e	V	- 2.4	-16.8	- 1 - 2		10.3	M4e
1	-51.2	-44.4	- 1 -13		11.5	...	1	-57.7	-18.2	-10 -20		11.2	G:	1	-25.4	-25.1	-25 - 8		10.6	K:
2	-43.4	-27.8	- 2 - 0		11.3	...	2	-50.8	-28.8	- 1 - 5		11.4	...	2	-26.4	-35.0	- 2 - 1		10.6	G0
3	-33.5	-19.5	- 1 - 1		9.8	A2	3	-39.3	-32.4	-24 - 8		11.2	A0:	3	-16.2	-43.5	- 2 - 0		10.8	K:
4	-30.4	-44.5	0 -12		10.5	A0	4	-22.8	17.0	-15 - 6		10.8	G:	4	-13.4	-25.4	-25 - 7		10.4	K
5	-34.1	-28.1	- 8 - 5		9.7	...	5	-20.9	-25.7	0 - 4		10.0	K0	5	-22.7	-20.5	-29 - 6		10.8	G
6	-34.6	-31.2	+ 7 -18		9.6	G0	6	-42.9	-43.8	-10 - 6		11.2	G	6	-58.7	+ 7.5	-29 - 6		9.9	K0
7	-40.3	-16.8	-30 -42		11.3	...	7	-49.6	- 9.7	- 1 - 1		10.7	K0							
8	-49.5	-34.3	-29 -29		11.8	...	8	-57.2	-30.4	- 9 - 1		9.6	F0							

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
S Tri 248 M 8.7-12.4							U Cet 235 M 6.8-13.4							R Hor 403 M 4.7-14.3						
		$02^h 21^m$					(Y)		$02^h 28^m$					(Y)		$02^h 50^m$				
			+32'	17'	114'	-25'				-13'	35'	156'	-61'				-50'	18'	231'	-57'
			+9	-9						-11	-6						-11	-2		
V	-4.8	-10.1	-13	+1	10.4	M2e	V	-0.8	+1.7	-1	-10	9.9	M4e	V	-0.1	-5.4	-122	-32	11.1	M7e
1	-55.2	-14.7	+20	-6	10.0	G:	1	-90.5	-51.5	+2	-5	10.1	K2	1	-63.0	-51.4	-6	-4	12.6	..
2	-23.1	+52.0	+24	-8	11.0	...	2	-48.9	-16.4	0	-3	11.1	K0	2	-50.6	-64.8	-5	-15	11.1	F5:
3	-17.0	-53.7	-43	+14	9.8	A:	3	-42.2	-27.4	+2	+5	10.0	F8	3	-21.1	-46.3	-5	-2	11.2	G3
4	-4.1	-29.6	+11	-6	11.2	...	4	-28.8	-54.1	-3	-7	12.1	...	4	-20.3	-31.2	-6	-7	11.2	F8
5	-39.3	-6.6	-35	-14	10.2	K:	5	-6.2	-41.0	0	-5	12.5	..	5	-20.4	-47.1	-11	-6	12.2	F2
6	-51.9	-19.8	-24	-8	10.7	K0	6	-10.2	-39.5	+2	-8	8.8	G0	6	-24.2	-74.1	-1	-16	11.1	gk
							7	-18.5	+3.4	-35	-3	11.6	G	7	-42.6	-38.9	-11	-4	9.8	G5
							8	-23.3	-54.0	+1	-3	12.6	...	8	-67.8	-40.4	0	-27	11.6	f::
RR Per 390 M 8.1-15.1							9	-25.7	-56.5	-23	-17	12.1	G	T Hor 217 M 7.2-13.7						
		$02^h 21^m$					10	-31.4	-32.6	-3	+1	11.7	G0	(Y)		$02^h 57^m$				
			+50'	49'	106'	-8'	11	-33.6	+1.0	-7	+9	11.8	..				-51'	02'	231'	-55'
			+7	-8			12	-61.9	-40.8	-9	-16	11.3	G0				-11	-3		
V	-9.1	-8.5	-7	-7	11.1	M6e								V	-2.7	-4.7	-4	-14	10.5	M4e
						M7e	RR Cep 383 M 9.0-15.5							1	-64.4	-23.7	-49	-36	10.0	F8
1	-57.8	-36.2	-15	-6	9.9	K0			$02^h 29^m$				2	-63.0	+13.4	-34	-5	12.2	..	
2	-46.9	-0.7	-21	-16	11.6	F0				-30'	42'	95'	-20'	3	-1.7	-47.1	-14	-41	10.8	G0
3	-28.1	-22.3	-1	+5	11.2	F0				+7	-6			4	-14.6	-59.2	-10	-37	11.3	..
4	-15.0	-33.5	-36	-27	10.9	G	V	-18.2	+1.1	-8	+7	10.8	M8e	5	-16.8	-72.0	-3	-43	11.3	g
5	-7.3	-36.2	+6	-1	10.3	G5	1	-65.0	-48.6	+8	+26	10.6	A5	6	-40.2	-10.2	-4	-4	11.6	..
6	-19.0	-35.9	-15	-5	9.7	A5	2	-61.5	-10.8	-5	-14	9.8	G5	7	-57.5	-7.3	-11	-3	11.5	..
7	-58.4	-14.6	-9	-10	11.4	K0	3	-53.4	-39.4	-3	-4	10.0	A0	U Ari 371 M 6.4-15.2						
8	-63.3	-39.1	0	+6	11.0	A2	4	-8.0	-48.2	-6	-12	10.0	K2			$03^h 05^m$				
							5	-29.8	-23.9	+4	+12	10.4	K0				-14'	25'	134'	-36'
R For 388 M 7.5-13.0							6	-41.9	-19.3	-7	-4	10.9	G5				-8	-9		
		$02^h 24^m$					7	-51.6	+1.4	-12	-11	11.5	G5	V	-6.2	-5.9	16	-7	11.2	M6e
			-26'	33'	183'	-67'	8	-64.6	-13.6	-15	-19	11.9	A0							
			-12	-4										1	-48.1	-12.0	-15	-20	10.3	K0
V	-3.2	-12.2	-2	-16	10.6	Ne								2	-41.0	-29.1	-15	-20	11.1	G5
1	-61.0	-0.1	+3	-33	11.5	..	R Tri 266 M 5.7-12.6							3	-38.8	-31.7	-15	-20	11.1	F0
2	-49.3	-12.0	-34	-11	10.9	K2			$02^h 31^m$				4	-50.3	-48.8	-15	-20	10.6	G5	
3	-34.6	-18.5	+5	-22	10.8	F0				-33'	59'	115'	-23'	X Cet 177 M 8.4-13.0						
4	-30.5	-19.9	+5	-24	11.6	F:				+8	-8					$03^h 14^m$				
5	-28.2	+13.1	-31	-84	10.5	F8	V	-6.5	-6.6	-14	-5	10.9	M4e				-01'	26'	151'	-45'
6	-24.0	-16.8	-20	-23	12.3	..														
7	-4.8	-34.5	-31	-36	11.7	..														
8	-5.3	-29.2	-74	-48	10.2	K0	1	-67.8	-23.1	-2	-3	11.6	K2							
9	-26.9	-12.7	-8	+18	9.0	F8	2	-44.2	-26.5	-4	-2	11.8	A:							
10	-59.4	-6.2	-37	-5	11.5	G:	3	-32.0	-12.9	-27	-2	10.6	F8							
11	-69.0	-12.9	-14	+13	10.7	G5	4	-10.5	20.0	-21	-4	10.4	...	V	-5.1	-6.4	-18	-16	10.9	M2e
12	-71.8	-26.3	-14	+12	12.2	..														
							5	-20.5	-41.1	+1	-1	10.2	A5							
U Cet 235 M 6.8-13.4							6	-27.2	-31.4	-10	+2	10.1	K2	1	-59.4	-16.7	-12	-2	10.2	F0
		$02^h 28^m$					7	-44.8	-27.7	+6	-6	10.0	K2	2	-30.7	-30.5	-24	-11	11.0	F0
			-13'	35'	156'	-61'	8	-55.0	-20.7	-16	-7	11.4	K0	3	-29.6	-14.0	-167	-102	9.3	K0
			-11	-6										4	-72.1	-49.4	-36	-13	12.2	..
V	-0.7	+1.5	-7	-8	10.4	M2e	T Ari 324 M 7.5-11.3							5	-13.6	-36.2	-13	-6	12.0	A0
						M4e			$02^h 42^m$					6	-18.5	-42.0	-7	-11	11.9	..
1	-82.0	+46.7	+7	+4	10.1	K2				-17'	06'	127'	36'	7	-25.0	-22.8	-28	-24	11.0	K:
2	-44.3	-14.8	-2	-7	11.1	K0				-10	-10			8	-35.1	-36.4	-48	-7	10.2	G5
3	-39.2	-24.8	-7	+6	10.0	F8	V	-20.4	-14.3	-29	-4	10.4	M6e	Y Per 252 M 8.1-10.9						
4	-26.1	-49.1	+2	-3	12.1	..										$03^h 20^m$				
5	+5.7	-37.2	-9	0	12.5	..											-43'	50'	118'	-9'
6	+9.3	-35.8	-1	-9	8.8	G0											+6	-10		
7	-16.9	+3.1	-24	-3	11.6	G	1	-52.8	-9.4	-1	+8	10.7	G5							
8	-21.3	-49.0	+6	-1	12.6	..	2	-47.1	-21.6	-7	-26	10.0	G0							
							3	-21.8	-25.9	-31	-28	9.7	K0							
							4	-17.9	-48.6	-26	-11	11.6	..							
9	-23.0	-51.3	-23	-23	12.1	G	5	-20.6	-22.2	-28	+14	11.0	..							
10	-28.6	-29.6	+8	-3	11.7	G0	6	-27.0	-29.0	-11	-35	10.5	K0							
11	-30.6	+0.9	-2	+9	11.8	..	7	-45.2	-1.9	-50	-15	9.3	G0							
12	-56.3	-37.0	-2	-24	11.3	G0	8	-46.8	-18.1	32	-37	11.9	..							
														V Per 252 M 8.1-10.9						
																$03^h 20^m$				
																	-43'	50'	118'	-9'
																	+6	-10		
V	-0.7	+1.5	-7	-8	10.4	M2e														
						M4e	1	-52.8	-9.4	-1	+8	10.7	G5							
1	-82.0	+46.7	+7	+4	10.1	K2	2	-47.1	-21.6	-7	-26	10.0	G0							
2	-44.3	-14.8	-2	-7	11.1	K0	3	-21.8	-25.9	-31	-28	9.7	K0							
3	-39.2	-24.8	-7	+6	10.0	F8	4	-17.9	-48.6	-26	-11	11.6	..							
4	-26.1	-49.1	+2	-3	12.1	..	5	-20.6	-22.2	-28	+14	11.0	..							
5	+5.7	-37.2	-9	0	12.5	..	6	-27.0	-29.0	-11	-35	10.5	K0							
6	+9.3	-35.8	-1	-9	8.8	G0	7	-45.2	-1.9	-50	-15	9.3	G0							
7	-16.9	+3.1	-24	-3	11.6	G	8	-46.8	-18.1	32	-37	11.9	..							
8	-21.3	-49.0	+6	-1	12.6	..														
9	-23.0	-51.3	-23	-23	12.1	G														
10	-28.6	-29.6	+8	-3	11.7	G0														
11	-30.6	+0.9	-2	+9	11.8	..														
12	-56.3	-37.0	-2	-24	11.3	G0														

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	
R Per 210 M 8.1-14.8							T Cam 374 M 7.3-14.2							R Cae 391 M 6.7-13.7							
	$03^h 23.7^m$		$+35^{\circ} 20'$		$124^{\circ} -16'$			$04^h 30.4^m$		$+65^{\circ} 57'$		$110^{\circ} -13'$			(Y)	$04^h 37.0^m$		$-38^{\circ} 26'$		$208^{\circ} -40'$	
			$+9 -13$			M2e				$+4 -11$							$+5 -2$				
V	-12.7	-10.4	-20	-1	10.6	M3e	V	-11.5	+2.1	-12	-3	10.4	S4.7e	V	-0.9	-0.4	-18	-6	9.3	M6e	
1	-52.6	-14.3	-16	-1	12.4	...	1	-44.2	-15.0	+4	0	10.9	A0	1	-74.6	-0.4	-4	-73	10.6	...	
2	-38.5	-44.7	+8	-1	9.9	F8	2	-26.0	-30.3	-4	0	9.6	G5	2	-64.6	-24.0	-3	-58	9.6	...	
3	-29.1	-47.2	+23	-8	11.6	F8	3	+17.7	+21.1	5	0	10.5	A5	3	-57.9	-68.5	0	+43	11.3	...	
4	-13.0	-37.9	-15	+9	11.3	...	4	+52.5	-5.8	+5	0	10.7	G0	4	-24.9	-67.0	-7	-28	11.0	...	
5	-26.4	-40.6	+3	0	9.8	F5							5	+9.4	-27.5	-2	+1	10.3	...		
6	-33.7	-45.4	-10	-9	9.9	F5							6	-56.6	-20.1	-2	-8	10.0	...		
7	-36.3	-16.2	+21	-25	10.4	F8							7	-74.4	-59.2	+6	+28	10.1	...		
8	-36.7	-48.5	-14	+16	10.8	F8							8	-81.5	-44.4	-2	-20	10.7	...		
T Eri 252 M 7.4-13.2							R Ret 278 M 6.8-14.0							V Tau 170 M 8.5-14.2							
	$03^h 51.0^m$		$-24^{\circ} 20'$		$186^{\circ} -47'$		(Y)	$04^h 32.5^m$		$-63^{\circ} 14'$		$241^{\circ} -39'$			$04^h 46.3^m$		$-17^{\circ} 22'$		$150^{\circ} -15'$		
			$+7 -3$			M3e				$-6 -9$							$-3 -8$			M0e	
V	-1.5	+7.8	+16	+14	10.5	M5e	V	-1.3	+1.5	+10	+17	10.0	M1e	V	-9.6	-8.1	-15	-6	10.4	M4e	
1	-61.3	-48.4	+4	-12	11.7	...	1	-79.3	+37.8	+7	+28	10.1	A4	1	-59.5	-39.5	+5	-14	9.4	K0	
2	-53.4	-47.0	-9	-6	12.2	...	2	-35.7	-66.1	-10	-16	10.1	G5	2	-35.7	-33.1	+4	-16	10.9	K0	
3	-35.0	-30.3	-10	-5	11.4	...	3	-30.5	+39.6	+5	-4	12.5	K	3	-32.8	-48.7	-1	-7	10.8	K0	
4	-33.3	-32.0	+30	+1	11.7	...	4	-20.4	-42.3	-2	-7	11.4	G	4	-23.7	-23.5	+7	+3	10.0	K0	
5	-32.7	-4.8	-7	+1	10.8	K	5	+20.0	-33.1	-7	+33	10.8	G	5	-17.9	-17.3	-15	-1	9.0	F2	
6	-14.3	-20.1	-1	+1	12.1	...	6	+27.4	+64.9	+7	-22	9.5	G2	6	-25.6	-54.1	+4	-1	10.2	K5	
7	+12.4	+44.4	-9	-8	11.7	...	7	+51.8	-25.0	-19	-10	9.5	G5	7	-49.1	-5.1	+7	0	11.1	K0	
8	-27.0	+40.1	0	-5	11.6	...	8	-66.7	+24.4	-19	-2	9.6	G	8	-74.8	-29.0	-10	-1	10.8	A0	
9	+44.4	-27.9	-3	+7	11.9	...	X Cam 143 M 7.4-13.7							R Cr. 379 M 9.1-13.4							
10	+41.1	-26.0	+8	-18	12.1	...		$04^h 32.8^m$		$-74^{\circ} 55'$		$103^{\circ} -20'$			$04^h 53.6^m$		$-07^{\circ} 59'$		$160^{\circ} -19'$		
11	+43.8	-29.6	0	+9	11.8	...				$+3 -9$							$-3 -8$				
12	+61.3	-8.4	-3	+1	11.8	...	V	+13.6	+14.0	-12	-10	10.8	M3e	V	-1.2	+4.4	-11	-6	10.0	Ne	
R Tau 324 M 8.1-14.7							1	-48.7	-26.3	-6	+5	12.0	...	1	-60.5	+7.5	0	-4	11.4	K0	
	$04^h 22.8^m$		$+09^{\circ} 56'$		$153^{\circ} -24'$		2	-40.6	-35.4	+44	+13	10.9	G0	2	-42.7	-51.9	-6	-4	11.8	...	
			$+5 -9$			M5e	3	-36.5	-20.2	-12	-13	11.0	K0	3	-16.9	-27.6	+3	-4	10.8	G5	
V	+11.0	-2.9	-12	-8	10.1	M7e	4	-34.1	-29.4	-27	-5	11.1	F0	4	-16.1	-39.8	-9	-1	9.4	F0	
1	-48.7	-22.8	-6	+9	11.2	...	5	-15.5	-37.2	+9	-4	10.8	...	5	-1.1	+53.1	-3	-3	9.7	F2	
2	-38.4	-17.9	-3	+13	10.9	...	6	-37.8	-34.0	+9	-12	11.3	...	6	-8.3	-51.2	-5	-12	10.5	G0	
3	-8.7	+24.6	+20	-34	10.9	...	7	+46.1	-27.9	-12	-17	10.6	G0	7	-62.5	-50.9	-6	-1	10.0	G5	
4	-7.8	-19.3	-12	+11	10.0	...	8	-60.5	+15.0	-6	+8	9.8	A2	8	-64.4	-20.6	-4	-7	11.5	F5	
5	+8.2	+44.1	-8	+14	11.4	...	RX Tau 335 M 9.1-14.8							R Lep 432 M 5.9-10.5							
6	+9.8	-41.5	-1	-9	10.6	...		$04^h 32.8^m$		$-08^{\circ} 08'$		$156^{\circ} -24'$			$04^h 55.1^m$		$-14^{\circ} 57'$		$182^{\circ} -30'$		
7	+36.4	-25.1	+10	-13	10.4	...				$+5 -9$							$-3 -3$			N6e	
8	+49.2	-19.3	0	+9	11.8	...	V	-4.5	+6.0	-6	-16	10.6	M7e	V	-16.7	+1.5	-4	-7	10.5	C76e	
S Tau 373 M 9.4-16.0							1	-57.9	+41.5	-14	+8	10.3	F0	1	-79.5	-30.1	-20	-20	10.8	...	
	$04^h 23.7^m$		$+09^{\circ} 44'$		$153^{\circ} -24'$		2	-53.9	+41.3	-4	+6	10.0	G0	2	-67.5	-55.7	-25	-15	11.9	...	
			$+4 -8$				3	-46.3	-52.6	0	+15	11.3	F8	3	-40.3	-18.8	+15	-13	12.0	...	
V	+25.3	-18.0	-16	-24	11.3	M7e	4	-32.1	+1.9	-18	-17	10.5	K0	4	-32.6	+45.6	-11	-22	11.5	...	
1	-62.8	+40.4	0	+4	11.8	...	5	-30.7	-31.7	-12	-14	8.9	A2	5	+43.7	-23.3	+19	+11	10.4	K0	
2	-30.1	-35.3	+14	-5	12.5	...	6	-20.4	+21.2	+1	0	10.6	K0	6	+44.5	-11.6	-5	-2	11.1	A0	
3	-28.0	-21.1	-7	-5	12.7	...	7	-0.6	-45.4	+11	+3	10.3	F8	7	-62.4	-2.8	-9	-13	10.0	K5	
4	-14.6	-16.5	-7	+6	10.8	...	8	-28.2	-21.4	+6	+3	11.2	K2	8	-69.2	-15.1	-4	+3	9.9	K0	
5	+12.1	+33.0	-2	+11	10.8	...	9	+47.3	+24.8	-3	-3	10.2	A0								
6	+34.3	-52.9	-7	+10	10.4	K0	10	+50.0	-22.8	-5	-5	10.6	K5								
7	+37.6	+0.7	+36	-45	10.2	G5	11	+53.5	+33.2	-11	+2	9.7	K0								
8	+51.4	-18.7	-26	+24	10.3	K0	12	+62.9	+9.8	+14	+4	10.3	F5								

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
T Lep 368 M 7.4-13.5							T Col 225 M 6.6-12.7							S Cam 326 SRa 8.1-11.0						
	05 ^h 00.6 ^m		-22° 03'		190° -31°		(Y)	05 ^h 15.6 ^m		-33° 49'		204° -32°			05 ^h 30.2 ^m		-68° 44'		112° +20°	
			+ 3 - 2							+ 3 + 1							+ 2 -13			
V	-10.0	-11.1	+10	-26	10.4	M6e M8e	V	- 0.1	+ 3.1	+23	+10	10.5	M6 M4e	V	+ 4.0	- 3.3	- 6	+ 1	9.5	R8e
1	-60.3	-46.4	+ 9	+ 4	10.8	G5	1	-73.8	+20.6	+15	- 9	11.0	F8	1	-48.1	+49.2	- 8	- 2	9.5	K0
2	-42.7	-18.3	- 7	- 1	10.5	G:	2	-71.8	-29.6	- 6	+ 2	9.9	F8.	2	-14.5	-47.6	-18	-24	10.8	K0
3	-36.7	+ 8.2	- 9	-11	10.3	F0	3	-18.9	+61.8	- 7	+29	11.6	...	3	-13.0	-51.3	-10	+26	10.9	G0
4	-33.7	+36.4	- 7	+ 3	10.6	...	4	- 8.0	-50.3	- 3	-22	11.9	...	4	+ 3.5	+42.0	-12	- 1	11.3	F8:
5	+20.5	-13.1	-26	- 6	10.6	...	5	+19.0	+47.6	- 7	+ 6	11.3	...	5	+35.5	+33.1	- 3	+ 3	9.8	K0
6	-29.7	+15.6	-10	+ 4	11.0	...	6	+19.3	-44.5	+17	+54	9.7	F8	6	+36.4	-25.4	- 9	- 2	10.7	G0
7	+54.0	-27.4	+10	+ 2	10.7	...	7	+63.4	+13.6	- 2	-26	11.6	...							
8	+69.2	+45.0	+26	- 1	10.5	...	8	+70.8	-19.1	- 9	-33	10.3	g:							
V Ori 268 M 8.9-14.7							W Aur 274 M 8.3-15.3							RU Aur 468 M 9.0-14.5						
	05 ^h 00.8 ^m		+03° 58'		164° -20°			05 ^h 20.2 ^m		+36° 49'		139° + 2°			05 ^h 23.3 ^m		-37° 35'		140° + 5°	
			+ 2 - 6							+ 9 - 6							+ 1 - 7			
V	+ 0.6	+ 3.1	- 4	+ 9	11.0	M3e	V	- 1.4	+16.3	- 8	- 5	10.2	M3e	V	-17.2	+ 2.1	0	+ 4	10.1	M8e
1	-67.1	- 7.0	-14	+ 1	9.1	F0	1	-47.6	-43.8	- 1	- 2	10.4	B2	1	-45.4	- 8.5	- 1	0	10.8	K0
2	-62.6	- 6.9	+12	- 3	10.2	K0	2	-39.0	+41.7	+ 1	+ 2	10.7	A0	2	-36.6	+27.1	+ 1	- 3	10.0	A2
3	-39.6	+40.2	- 6	- 9	11.2	A5	3	+38.1	+49.4	- 1	- 2	9.2	A0	3	-27.1	+23.2	0	- 1	10.2	K0
4	-17.3	-27.6	+ 9	+10	11.2	...	4	+48.5	-47.3	+ 1	+ 2	11.3	A0	4	-13.6	-46.4	0	+ 4	10.7	...
5	+ 6.6	-25.5	+14	+ 4	11.6	A2							5	+ 1.7	-44.2	- 4	-15	10.5	A:	
6	+19.3	- 1.2	-26	-24	11.6	C5							6	+16.1	+43.9	+ 4	+ 5	10.9	A0	
7	+28.4	+28.3	- 5	+ 3	10.0	K2							7	+50.8	+20.5	- 5	- 1	9.5	A0	
8	+28.5	-24.8	+ 5	+11	10.4	..							8	+54.1	-15.6	+ 5	+11	10.2	B8	
9	+51.4	+16.9	+ 6	+ 6	10.2	F2	S Aur 590 SRa 8.2-12.5						U Aur 407 M 7.5-15.5							
10	+52.4	+ 7.6	+ 4	0	10.8	...		05 ^h 20.5 ^m		+34° 04'		141° + 1°			05 ^h 35.6 ^m		-31° 59'		145° + 3°	
										+ 1 - 9							+ 1 - 7			
S Pic 427 M 7.2-14.0							V	+ 8.6	-10.7	+ 8	- 6	10.4	N3e	V	-11.8	+ 9.8	-11	- 7	10.9	M7e M9e
(Y)	05 ^h 08.3 ^m		-48° 38'		222° -35°		1	-44.3	-26.9	- 6	0	11.1	F8	1	-65.9	- 9.1	- 2	+ 7	11.1	A:
			- 2 + 2				2	-36.1	-26.6	- 6	0	10.2	A0	2	-42.6	-21.2	- 2	- 1	8.8	A0
							3	-36.0	-32.9	- 6	0	10.0	A2	3	-34.1	+13.6	- 3	- 1	11.6	...
V	- 4.3	- 1.5	+ 9	+ 2	10.4	M7e M8e	4	-44.4	-32.6	+ 6	0	10.1	..	4	-32.8	-28.9	+ 1	- 4	9.8	K0
1	-64.7	+ 5.7	+ 3	+ 2	13.1	...							5	+18.2	-29.5	0	- 5	10.8	A0	
2	-49.7	-21.7	- 3	0	12.0	...							6	+44.1	-45.0	- 7	+14	10.0	A0	
3	-28.3	-52.5	+ 9	- 2	12.3	...							7	+51.0	+ 9.1	+ 6	-12	9.6	A5	
4	-11.4	+53.0	- 9	0	12.2	...							8	-52.1	-21.4	+ 1	+ 2	10.4	A0	
5	+23.5	+48.8	-12	+ 1	13.1	...	S Ori 416 M 7.5-13.5													
6	+35.3	+42.7	+18	- 3	12.8	...		05 ^h 24.1 ^m		-04° 46'		175° -19°								
7	+34.5	-50.8	- 6	+ 2	12.5	...														
8	+60.7	-25.3	0	- 1	12.1	...														
										+ 2 - 6										
							V	- 4.8	-10.6	+ 7	- 7	10.2	M7e	S Ccl 326 M 8.9-14.2						
							1	-55.0	-12.9	- 5	+13	10.8	...	(Y)	05 ^h 43.2 ^m		-31° 44'		204° -26°	
							2	-51.8	-23.3	-14	+19	10.7	K0				+ 1 0			
							3	-43.7	-36.8	0	0	10.4	F8							
							4	-40.5	-41.5	+11	-11	10.6	F8	V	+ 1.1	+ 1.7	-16	+ 6	11.3	M6e
							5	-37.4	-38.2	-14	-21	10.7	G5	1	-73.0	-25.5	-12	- 4	12.4	...
							6	-33.4	-43.8	- 6	0	10.2	..	2	-48.3	-30.6	+20	+ 8	12.4	...
							7	+ 5.8	-29.8	+10	- 5	9.8	F8	3	-43.6	-57.4	+ 1	0	12.0	...
							8	-35.1	-30.4	- 1	-12	9.4	F2	4	-12.1	+64.9	- 9	- 4	11.6	...
							9	+38.7	+10.5	-14	- 5	10.6	F8	5	+27.8	+27.5	- 3	- 1	10.4	G0:
							10	+58.2	-45.8	- 7	+10	10.8	.	6	+29.4	-47.7	+ 2	- 6	11.4	...
							11	+61.4	+ 2.6	- 2	+ 4	11.0	.	7	+59.2	-41.5	+ 9	- 9	10.4	g5
							12	+62.5	+ 6.8	-14	-16	10.8	G:	8	+60.5	+49.2	- 8	- 2	13.0	...
R Aur 459 M 6.7-13.7																				
	05 ^h 09.2 ^m		+53° 28'		124° -10°															
			+ 1 - 8																	
V	+ 2.0	- 3.9	+ 5	- 6	10.1	M7e M9e														
1	-47.5	+24.6	+ 4	- 3	11.2	A5														
2	- 9.1	-50.6	- 1	- 3	9.3	A2														
3	+ 8.8	+42.9	+ 4	+ 1	11.0	A5														
4	+18.8	+36.1	+ 1	- 3	9.7	K0														
5	+29.1	-18.6	- 6	- 2	11.1	F0														

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
Z Tau 494 M 9.2-14.1							Z Aur 135 SRd 9.2-11.7							V Mon 335 M 6.0-13.7						
	05 ^h 46.7 ^m		+15° 46'		160° - 4'		05 ^h 53.7 ^m		+53° 13'		127° +15'			06 ^h 17.7 ^m		-02° 09'		179° - 6'		
			0 - 4						0 - 9				G6e			- 1 - 6				
V	+18.0	-13.0	0	+ 7	10.5	M7	V	+12.6	-10.3	+11	-11	10.7	(M1)	V	- 1.9	+17.3	+12	- 1	10.1	M5e
1	-47.6	+39.3	+ 1	- 1	11.4	A2	1	-71.2	+21.6	- 9	- 5	10.8	F2	1	-67.4	+14.1	- 8	-41	9.8	K0
2	-20.1	-41.0	- 1	+ 1	11.1	...	2	-35.1	-34.7	- 2	- 8	10.6	G5	2	-49.5	-35.0	+ 5	+21	10.0	K0
3	+33.4	+34.1	- 1	+ 1	11.5	A0	3	-28.5	- 7.7	+ 2	-11	10.9	A5	3	-26.4	+44.0	+ 5	-80	10.1	F2
4	+34.2	-32.4	+ 1	- 1	11.9	A0	4	- 7.9	+35.8	+ 5	+ 2	11.1	...	4	-22.1	-25.2	- 2	+19	9.1	A2
							5	+13.1	-28.3	- 7	+ 3	10.5	...	5	+19.5	-36.8	- 8	-43	10.3	F8
							6	+14.1	-12.1	+ 3	- 6	10.8	A0	6	+35.4	-19.8	- 4	+13	10.0	K0
							7	+51.5	+ 9.4	+ 1	+15	10.9	...	7	+55.3	+39.6	+ 8	+26	10.7	...
							8	+64.2	+15.9	+ 3	-12	10.3	...	8	-55.2	-20.4	+ 5	+ 4	9.4	E0
RU Tau 568 M 10.1-15.3							RS Aur 176 SRa 10.8-12.5							U Lyn 436 M 8.8-15.0						
	05 ^h 46.9 ^m		+15° 57'		160° - 4'		05 ^h 56.5 ^m		+45° 18'		134° +12'			06 ^h 31.9 ^m		+59° 57'		123° +23'		
			0 - 8						0 - 13							- 2 - 14				
V	+14.8	- 5.5	- 5	- 4	10.9	M6.5	V	- 4.4	- 4.8	- 8	-11	10.1	M4e	V	+ 3.7	- 7.2	+ 2	+ 3	10.5	M8e
1	-73.9	- 6.8	- 8	-12	10.2	F8:	1	-35.0	- 9.5	+12	- 1	9.8	K0	1	-58.8	-41.8	-10	+ 3	11.0	G5
2	-32.4	-48.2	+ 6	+ 7	10.4	...	2	-26.7	+26.8	-13	+ 1	10.9	...	2	-55.1	-11.7	+ 1	- 3	11.3	K5
3	-25.9	+38.7	- 3	+ 3	11.7	A:	3	+30.9	-24.7	-13	+ 1	9.7	F2	3	-29.3	-31.6	+ 9	0	10.3	K0:
4	-11.6	+12.9	+ 5	+ 2	11.3	A:	4	+31.9	+ 7.4	+13	- 1	10.2	G:	4	+30.9	-30.3	- 5	+10	10.7	F2
5	+26.2	+26.1	+ 2	- 3	10.9	A:								5	+50.6	-22.7	- 4	- 9	10.1	A5
6	+26.9	+38.4	- 4	- 2	9.9	A:								6	+61.7	+31.1	+ 9	9	11.1	...
7	+32.6	-45.1	+ 5	0	10.5	K0														
8	+58.1	-15.9	- 3	+ 5	10.9	A0														
V Cam 522 M 8.5-16.0							X Aur 164 M 8.0-13.6							S Lyn 298 M 8.5-14.6						
	05 ^h 49.4 ^m		+74° 30'		106° +24'		06 ^h 04.4 ^m		+50° 15'		131° +16'			06 ^h 35.9 ^m		+58° 01'		125° +23'		
			0 - 13						0 - 15							- 2 - 12				
V	+ 7.6	- 0.3	- 3	+18	10.2	M7e	V	- 8.5	-23.7	- 3	-14	10.1	M3e	V	-19.5	+14.1	- 5	-12	10.7	M7e
1	-64.5	+ 4.4	+ 9	-33	9.8	A5	1	-51.2	+45.6	+ 6	+ 4	9.4	K5	1	-61.6	-29.2	-18	+ 9	10.1	F0
2	-35.3	+28.6	+ 6	+35	10.9	F2	2	-30.5	+37.1	+16	-11	10.5	K0:	2	-50.5	+53.8	-31	+21	11.7	F8
3	-32.8	-35.1	0	+12	11.1	A5	3	-15.9	-36.5	-23	-15	10.2	F8	3	-33.0	-42.0	+ 5	+ 6	10.8	K0
4	- 3.3	+ 8.5	-14	-14	10.3	G5	4	+ 1.3	- 4.1	- 8	0	10.4	K0	4	-27.6	+18.9	+44	-36	9.7	A0
5	+ 4.8	-13.8	+ 4	-13	11.3	G0	5	+ 7.7	-15.9	-23	-15	10.3	G5	5	-25.4	+38.4	- 6	+11	9.9	K5
6	+26.6	+27.4	0	0	11.6	...	6	+44.8	- 2.4	+16	+22	10.3	...	6	+35.3	-12.2	- 1	-11	11.3	K0
7	+47.5	-17.2	- 4	-25	9.3	A5	7	+43.8	-52.6	- 1	-17	10.3	G5	7	+44.6	-49.3	-14	- 4	10.2	F2
8	+57.0	+ 2.2	- 1	+13	10.0	A2								8	+57.2	+21.5	- 7	+ 5	11.0	F5
U Ori 372 M 5.3-12.6							V Aur 354 M 8.5-13.0							X Gem 263 M 7.6-13.6						
	05 ^h 49.9 ^m		+20° 10'		156° - 1'		06 ^h 16.5 ^m		+47° 45'		134° +17'			06 ^h 40.7 ^m		+30° 23'		153° +14'		
			0 - 6						- 1 - 8							- 1 - 8				
V	+ 8.5	- 1.4	-12	- 4	9.6	M6e	V	+ 4.0	- 2.3	+ 2	+ 2	10.2	C55e	V	-13.7	- 4.7	+ 1	-11	9.7	M5e
1	-51.3	+35.9	- 2	- 3	11.5	...	1	-48.2	+25.4	+ 3	- 1	11.5	...	1	-46.0	-21.3	+ 7	0	9.5	A5
2	-49.1	-24.0	- 1	- 1	10.6	A5:	2	-48.5	-33.9	+ 5	- 5	11.1	...	2	-35.1	+24.6	+10	- 4	9.5	K0
3	- 6.9	-37.5	+ 3	+ 4	10.3	A5	3	-23.4	+33.0	- 1	- 7	11.1	...	3	-33.8	+34.6	-26	+ 8	11.3	F0
4	+ 2.8	+25.4	+ 4	0	10.5	...	4	-17.9	-25.2	- 5	0	10.9	...	4	-30.6	-27.6	+ 9	- 4	11.3	A2
5	+22.2	+17.5	+ 1	- 2	10.8	...	5	+21.1	+ 4.4	- 4	-17	11.0	...	5	+ 9.9	+20.6	- 6	- 2	11.8	G:
6	+22.9	+ 2.2	- 3	+ 5	10.4	A0	6	+26.4	+36.1	- 6	+12	10.6	F0	6	+24.9	-15.7	+ 2	+ 3	11.7	A0
7	+29.8	- 2.2	+ 1	- 1	9.7	A0	7	+38.7	-17.8	- 1	+ 3	10.4	F2	7	+43.2	-51.6	-18	+ 2	10.8	F8
8	+29.9	-17.3	- 3	- 1	10.6	A0	8	+51.8	-21.3	- 2	+ 2	9.9	A0	8	+67.6	+36.6	+21	- 2	12.4	...

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
Y Mon 231 M 8.6-14.9							V CM1 366 M 7.4-14.9							Z Pup 510 M 7.2-14.6						
	06 ^h 51.3 ^m		+11° 22'		171° + 8°			07 ^h 01.5 ^m		-09° 02'		174° + 9°			07 ^h 28.3 ^m		-20° 27'		204° + 1°	
			- 2 - 7							- 2 - 5							- 3 - 2			
V	+12.6	-14.9	0	-10	10.6	M4e	V	- 2.8	- 2.3	-15	+21	10.8	M6e	V	+11.4	+ 7.2	+ 3 - 4		9.7	M9e
1	-49.2	+10.4	-11	0	9.9	K0	1	-53.7	-49.5	-48	+68	10.1	F2	1	-63.3	+34.6	+ 4 - 3		10.4	F:
2	-29.6	-32.1	- 2	0	9.2	A5	2	-25.9	+39.9	- 4	+20	11.3	A0	2	-58.5	-45.9	+ 1 0		10.5	A:
3	-15.8	+33.4	0	+11	11.5	K0	3	-15.9	+30.2	- 5	+ 4	9.2	A0	3	-28.3	+10.0	- 6 + 3		10.1	A:
4	-13.9	+29.8	+13	-11	11.6	K0	4	-10.5	-35.7	+57	-91	10.4	dM0	4	-12.5	- 6.1	+ 1 0		10.3	A:
5	+ 7.3	-49.9	0	+ 6	10.8	...	5	+19.5	+26.9	+ 5 - 5		9.6	A0	5	+11.5	- 9.0	+ 6 - 1		10.1	A:
6	+26.4	+26.0	+ 4 - 2		10.9	A5	6	+21.5	-36.4	-13	+27	10.5	A0	6	-33.2	+11.4	- 7 +18		10.3	...
7	+29.9	+ 2.5	- 6 + 1		10.6	A5	7	+29.9	+30.9	+ 4 -18		11.0	A0	7	+40.4	+36.8	+10 -16		10.3	K:
8	+44.9	-20.1	- 2 - 6		10.9	F8	8	-33.1	- 6.2	+ 3 - 4		9.8	A0	8	+74.2	-31.8	- 9 0		9.9	A:
X Mon 156 SRb 6.9-10.0							R CM1 338 M 7.4-11.6							T CM1 319 M 9.5-14.6						
	06 ^h 52.4 ^m		-08° 56'		189° - 2°			07 ^h 03.2 ^m		+10° 11'		174° + 9°			07 ^h 28.3 ^m		+11° 57'		175° +16°	
			- 2 - 4							- 2 - 6							- 3 - 7			
V	+ 6.3	+ 6.5	- 1	-19	9.6	M3e	V	- 3.3	+ 8.7	-10	+ 5	10.0	Ce	V	+ 2.4	+13.7	-13 + 2		10.6	M5e
1	-60.1	+24.4	- 1 + 2		8.9	M0	1	-31.5	-37.5	+ 1 - 1		10.0	A0	1	-74.5	-36.4	+ 3 - 5		11.0	...
2	-36.8	+ 4.8	0 - 6		10.2	K0	2	-11.8	+37.1	- 1 + 1		10.6	K0	2	-53.4	+12.4	-13 + 5		10.1	F5
3	-13.2	+14.7	- 1 + 3		9.9	B8	3	+20.0	+29.1	+ 1 - 1		9.5	K0	3	-22.4	+40.7	+ 6 - 1		10.5	A2
4	- 5.4	+43.5	+ 2 + 1		11.3	A0	4	+23.3	-28.7	- 1 + 1		9.9	A5	4	-20.8	-32.5	+ 4 - 1		9.7	A2
5	+11.7	-48.6	+ 9 - 1		9.5	K0	RR Mon 393 M 8.4-15.2							5	+ 3.7	-32.3	+ 1 + 4		11.2	G0
6	+18.4	-42.2	- 7 - 4		9.3	A0		07 ^h 12.4 ^m		-01° 16'		193° + 8°		6	+42.8	+44.0	- 1 -10		9.4	A5
7	+27.6	+36.5	0 0		9.4	B8				- 2 - 4				7	-59.1	+42.8	+ 8 - 6		10.9	A0
8	-57.8	-33.2	- 2 + 8		9.1	A0				0 - 5		11.4 S7.2e:		8	-65.5	-38.5	- 8 + 1		10.6	A5
	R Lyn 379 M 7.2-14.0									+ 8 -10		11.3 ..		ST Gem 246 M 9.2-13						
	06 ^h 53.1 ^m		+55° 28'		128° +25°					+ 8 - 6		11.5 ...			07 ^h 32.7 ^m		+34° 43'		153° +26°	
			- 2 -13							- 5 + 6		11.4 ...					- 4 -11			
V	-12.6	-20.7	-21	+ 3	10.1	S6.8e:	V	- 0.5	+ 6.0	- 2 + 4		11.4	A0	V	+ 2.1	- 7.2	-23 -14		9.9	M8e
1	-63.4	+35.5	-15	+11	9.5	F2				- 3 - 8				1	-47.6	+ 7.5	+23 -17		10.3	K:
2	-28.3	-16.8	+ 6 - 6		11.0	...				- 5 - 4		9.6 M5e		2	-42.3	-29.1	-33 -38		10.4	K0
3	-23.5	-48.5	+ 8 - 5		10.5	...				+ 7 - 1		10.0 A5		3	-28.6	- 7.1	+ 9 +98		11.5	K:
4	+26.9	-11.7	0 + 5		10.0	K0				- 6 + 3		9.4 A5		4	-13.4	-32.2	+ 1 -43		10.2	K0
5	+40.2	-30.8	- 8 0		9.2	K0				0 - 3		10.4 A0		5	+10.8	+27.2	- 5 +17		10.3	..
6	+46.2	+38.6	+ 8 - 5		10.1	K0				- 5 + 3		10.6 A0		6	+31.3	-41.4	- 9 -43		10.6	G5
R Gem 370 M 6.0-14.0										- 7 - 1		10.9 ...		7	+41.8	-19.7	- 1 -11		11.7	...
	07 ^h 01.3 ^m		+22° 52'		162° +15°					+ 6 - 2		10.2 G5		8	-48.0	+36.5	+15 -38		10.3	K0
			- 3 -10											U CM1 410 M 8.1-13.6						
V	-13.7	- 1.6	0	+ 7	10.2	S6.9e				- 3 - 7					07 ^h 35.9 ^m		-08° 37'		179° +16°	
1	-69.9	+10.2	+ 6 + 6		10.4	G				- 7 - 28		9.9 K0					- 4 - 8			
2	-52.4	+37.2	- 3 -13		10.5	K0				- 2 +14		9.8 A0		V	- 8.2	+17.9	0 + 4		10.4	M4e
3	-24.3	-24.7	+ 3 + 6		10.7	F8				- 4 +14		10.8 ...		1	-59.6	+34.5	- 7 + 1		10.6	K2
4	- 6.6	-46.3	1 0		10.2	A0				- 7 +13		9.7 K0		2	-58.0	-21.2	0 + 8		9.5	A2
5	+ 4.9	-41.4	+ 7 + 3		10.1	A5				+ 7 -28		10.2 K0		3	-31.0	+20.3	+ 7 - 9		9.0	M0
6	-32.6	-21.7	0 + 5		10.8	K2				0 +15		10.0 K0		4	+47.1	-39.2	- 3 - 2		9.7	G5
7	+47.3	+13.6	- 6 + 4		10.2	A2								5	-50.3	-20.3	+ 4 - 5		10.4	K0
8	+68.4	- 9.7	- 1 -12		10.7	F8								6	-51.2	-25.9	0 + 9		10.5	G0

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
S Gem 294 M 8.2-14.7							V Cnc 272 M 7.5-13.9							X UMa 219 M 8.1-14.8						
07 ^h 37.0 ^m -23° 41' 164° 23'							08 ^h 15.0 ^m +17° 36' 174° 29'							08 ^h 33.6 ^m +50° 29' 136° 39'						
- 5 -10							- 9 -12							- 6 -12						
V +1.0 -2.9 -1 +2 5.9 M4e M5e							V -5.8 -7.9 -8 +16 9.8 S2.9e:							V -11.5 +6.3 +1 -5 10.5 M4e						
1	-55.5	-45.3	-3	-2	10.5	...	1	-77.6	-21.1	-21	+22	11.1	...	1	-76.0	-27.8	-33	+14	10.5	F8
2	-51.8	-48.9	0	+2	11.2	...	2	-38.2	-19.6	+35	-17	10.6	F8	2	-59.8	+20.7	+14	+10	10.4	K5
3	-40.8	-28.1	-6	-11	10.8	G5	3	-34.9	+27.0	-14	-5	10.4	G5	3	-41.6	+45.8	-2	-6	11.6	...
4	-14.9	+34.3	+6	+11	11.3	...	4	+3.0	+35.4	+13	-10	9.3	G0	4	-26.8	-34.2	+21	-18	11.4	G:
5	+12.4	-8.5	-4	+2	10.1	K0	5	+15.2	+34.0	+8	+3	10.5	F0	5	+30.9	-19.2	-4	-1	10.0	K5
6	+39.4	+13.1	+1	+20	10.7	K0	6	+37.0	-45.8	+2	-12	10.8	F8	6	+38.9	+21.9	-23	+5	10.7	K0
7	+54.4	+26.2	-10	-33	10.8	F2	7	+46.3	-47.5	-16	+7	11.0	F0	7	+61.9	-24.5	+16	+5	11.2	G:
8	+56.8	-40.6	+5	+11	10.4	K5	8	+49.2	+37.6	-7	+12	9.6	F8	8	+72.6	17.3	+11	-9	11.4	...
W Dra 121 M 7.5-13.6							T Lyn 419 M 9.0-13.3							S Hya 257 M 7.4-13.3						
(Y) 07 ^h 42.7 ^m -41° 57' 224° -8'							08 ^h 16.4 ^m +33° 50' 156° +34'							08 ^h 48.4 ^m +03° 27' 193° +30'						
- 4 +2							- 6 -10							- 9 -8						
V 0.0 +1.6 +20 0 10.2 M3e							N0e							V +3.6 -1.1 +2 +21 10.6 M4e						
1	-57.3	+15.8	+12	-6	11.2	G5:	V	+10.4	-7.2	+9	0	10.1	C63e	1	-66.9	-9.0	-10	-17	9.0	F2
2	-55.0	-39.7	+16	+22	10.9	A0:	1	-65.6	+24.9	-10	-13	11.8	...	2	-44.9	-22.5	-16	-2	10.2	K5
3	-34.0	-41.8	-53	+13	10.8	F:	2	-53.2	-43.6	-4	+2	11.1	K0	3	-37.4	-22.8	-1	+8	10.7	K:
4	-30.9	+49.0	+24	-29	10.3	...	3	-24.5	-32.9	-5	+1	10.9	F2	4	-26.4	-6.7	+1	+8	8.9	M0
5	+33.0	+45.7	+33	-34	9.9	A3	4	-3.8	+41.9	+19	+9	11.7	F8	5	-19.2	+56.5	+27	+3	9.4	K0
6	+34.5	-37.7	+16	-10	11.3	G	5	+26.7	+5.5	+11	+3	11.7	K0:	6	+18.3	-25.0	-3	+14	11.4	...
7	+51.5	+24.7	-69	+69	9.9	G3	6	+36.4	-24.0	+9	-3	10.3	K2	7	+38.4	+18.4	+22	+8	8.2	K2
8	+58.3	-15.9	+20	-24	10.5	G5	7	+36.7	+28.0	-3	+9	10.6	K0	8	+42.8	+20.0	-43	-11	10.8	G5
T Gem 288 M 3.0-15.0							8	+47.2	+0.1	-14	-3	9.8	F8	9	+45.1	-1.8	+23	-29	11.1	...
07 ^h 43.3 ^m +23° 59' 165° +24'							RT Hya 253 SRa 7.1-10.2							T Hya 288 M 7.2-13.2						
- 6 -13							08 ^h 24.8 ^m -05° 59' 198° +20'							08 ^h 50.8 ^m -08° 46' 205° -24'						
S4.5.4e							- 8 -7							- 8 -5						
V +7.7 -6.4 +2 +2 11.1 S9.5e							M6e							M3e						
1	-48.4	-43.2	+2	+16	11.0	G:	V	+20.7	+0.6	+26	-48	11.0	M7	V	+10.0	+7.2	0	-8	10.1	M4e
2	-35.2	-44.8	-6	0	9.7	F8	1	-72.5	-36.8	+16	-9	11.1	G:	1	-48.2	+23.9	+4	-2	9.3	K2
3	-20.5	-31.0	-5	-9	10.8	G5	2	-59.3	+47.1	-13	+6	11.0	G0	2	-35.8	+1.6	-9	-4	10.6	K:
4	-19.3	+45.3	+10	-7	11.2	...	3	-47.0	-54.8	-3	+2	9.1	F2	3	-35.1	-31.1	+3	-2	10.0	K0
5	-25.3	-50.6	+5	-1	10.6	F8	4	+2.7	+40.4	+9	-2	10.9	G:	4	-10.1	-34.5	+3	+8	11.3	...
6	+27.5	-21.9	-2	-6	11.3	...	5	+28.9	-13.5	-4	-4	11.0	G:	5	+15.3	+15.8	-1	+11	10.0	...
7	+29.7	+43.4	-4	-1	10.0	G5	6	+39.2	-41.6	-9	+11	11.5	G:	6	+20.2	-36.6	-6	+7	9.6	K0
8	+40.9	+13.1	+1	+8	11.5	...	7	+44.2	+5.2	+17	-18	10.2	K0	7	+36.3	-30.8	+3	+5	9.9	...
R Cnc 362 M 6.2-11.8							8	+63.8	+53.9	-13	-14	10.4	G5	8	+59.4	+22.7	-4	-13	9.4	K0
08 ^h 11.7 ^m +12° 02' 179° +25'							U Cnc 305 M 3.0-15.5							S Pyx 207 M 8.0-14.0						
- 7 -9							08 ^h 30.1 ^m +19° 14' 174° +33'							09 ^h 00.7 ^m -24° 41' 220° +15'						
M5e							-11 -15							- 5 -2						
V +13.8 -6.4 +9 +1 10.4 M2e							9.8 M2e							V -16.3 -21.4 -10 +1 11.1 M3e						
1	-69.4	+14.6	+3	+9	10.7	...	1	-53.5	-22.6	-12	+8	9.4	G5	1	-35.4	-35.2	-14	-4	12.0	...
2	-59.9	+49.6	-15	-12	9.9	K0	2	-35.8	+5.1	-9	-5	10.5	F5	2	-25.5	-33.4	+5	+9	11.9	...
3	-59.8	-32.5	-9	-7	10.0	...	3	-33.5	-39.6	+11	-3	10.0	K0	3	-17.2	-41.2	+10	-5	11.5	...
4	-43.3	-16.4	+7	-3	11.2	...	4	-13.0	+43.2	-10	-1	10.0	G0	4	-15.9	+18.4	0	0	12.3	...
5	-39.6	+46.8	+5	+1	11.0	...	5	+13.3	+47.1	+25	+8	10.3	G:	5	+14.6	+35.6	-1	-3	10.2	...
6	-1.9	-37.7	+8	-12	10.3	F8	6	+34.7	-38.2	-7	+7	11.3	...	6	+20.6	-24.3	-19	+10	9.4	...
7	+28.0	+51.4	+5	-19	10.6	...	7	+42.2	+12.2	-26	-3	9.2	G:	7	+25.7	+23.6	+15	+7	10.6	...
8	+45.5	-41.0	-9	-3	10.0	...	8	+45.6	-7.2	+8	-13	9.8	G5	8	+33.2	-14.0	+5	-14	12.1	...
9	+48.8	-42.5	-4	-4	10.7	...														
10	+48.9	+0.7	-1	+7	10.4	...														
11	+51.7	-14.7	+6	+5	10.5	...														
12	+51.0	+21.7	+2	+14	10.7	A:														

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
W Cnc 393 M 7.4-14.4							Y Dra 326 M 7.8-15.0							R Leo 313 M 5.4-10.5						
	09 ^h 04.0 ^m		+25° 39'		170° +42°			09 ^h 31.7 ^m		+78° 18'		101° +38°			09 ^h 42.2 ^m		+11° 54'		192° +45°	
			- 8 -10							-11 -10							-12 -10			
V	+ 7.1	+18.0	- 9	- 1	10.8	M7e	V	- 7.4	-12.7	-12	-15	10.6	M5e	V	+ 5.7	- 4.7	+19	-25	10.2	M7e M9e
1	-52.6	+18.4	-11	- 8	11.9	...	1	-47.5	-32.5	+14	+ 1	11.2	G:	1	-61.8	+ 8.5	+31	- 1	10.1	K0
2	-41.4	-50.4	+ 4	- 3	9.2	M0	2	-45.7	+12.3	-16	+ 5	10.6	G:	2	-38.9	-25.0	+29	-28	10.7	G:
3	-36.7	-51.9	+ 7	+10	11.2	...	3	-40.5	+24.1	+ 9	+ 5	10.8	G:	3	- 3.9	-14.0	-60	+30	9.8	G0
4	+ 1.6	+44.5	+16	- 6	11.4	...	4	-31.9	-24.1	- 7	-10	11.1	G:	4	+32.2	+ 3.0	+ 7	-26	11.2	K0
5	+24.2	+33.8	+ 4	+ 7	10.8	...	5	+ 6.8	+29.8	- 4	-12	10.0	K0	5	+32.6	+53.7	-37	+27	9.5	F8
6	+31.3	+50.0	+ 1	+ 9	11.8	...	6	+44.7	-21.8	+ 5	+23	11.2	G:	6	+39.6	-26.3	+31	- 1	9.7	G0
7	+32.3	-45.8	-12	- 8	11.6	...	7	+54.1	-14.3	-12	-14	9.5	A0							
8	+41.1	+ 1.5	-10	- 2	11.0	...	8	+60.0	+26.4	+11	+ 2	9.8	G:							
RW Car 318 M 8.5-15.0							RS Leo 209 M 10.7-16.0							S LMi 234 M 7.9-14.3						
(Y)	09 ^h 18.2 ^m		-65° 20'		253° -13°			09 ^h 37.9 ^m		+20° 19'		180° +48°			09 ^h 47.8 ^m		+35° 24'		157° +53°	
			- 5 + 2							-12 -12							-13 -13			
V	+42.7	-12.0	-13	+ 4	11.3	M4e	V	+ 7.8	-12.9	0	+23	11.4	M5e	V	+13.2	+10.6	+21	+18	10.9	M4e
1	-66.0	-52.2	+10	+ 2	11.7	...	1	-61.5	- 3.8	+ 2	- 1	11.4	...	1	-72.4	-27.6	0	- 3	11.9	...
2	-64.7	+48.4	+ 5	- 3	11.2	...	2	-55.9	+15.2	+10	- 8	10.3	K0	2	-64.9	+18.0	+11	+ 2	10.1	K5
3	-34.8	+24.2	- 4	- 3	12.0	...	3	-48.8	+ 1.5	0	+ 1	10.6	F0:	3	-60.0	-16.3	+12	+ 1	11.8	...
4	-22.6	-22.4	-11	+ 5	12.2	...	4	-26.8	+ 5.6	-14	+ 7	9.5	A5	4	-24.6	+58.3	-23	- 1	11.6	K5
5	+27.2	-11.0	+ 9	0	13.2	...	5	+21.3	-51.2	-10	+ 8	10.0	G5	5	+24.3	-33.4	+11	+ 6	10.2	G5
6	+29.2	+16.9	-15	+12	11.4	...	6	+29.0	+26.9	0	- 2	11.3	...	6	+45.7	-45.4	-23	- 5	9.8	A2
7	+62.5	+56.8	+13	- 5	10.9	...	7	+36.4	+49.2	0	+ 2	10.9	...	7	+75.0	+24.8	-12	-30	10.6	G5
8	+69.2	-60.8	- 7	- 7	11.0	...	8	+49.9	-48.1	+13	- 9	9.9	F3	8	+77.0	+21.5	+24	+28	10.1	K9
							9	+50.7	-27.3	- 2	+ 1	11.3	F8							
X Hya 302 M 8.0-13.6							R LMi 372 M 6.3-13.2							V Leo 273 M 8.4-14.6						
	09 ^h 30.7 ^m		-14° 15'		216° +28°			09 ^h 39.6 ^m		+34° 58'		158° +51°			09 ^h 54.5 ^m		+21° 45'		180° +52°	
			- 8 - 4							-12 -12							-13 -11			
V	- 8.9	+ 7.4	-50	+ 2	10.1	M7e	V	+ 3.3	+ 4.6	+19	+14	10.2	M8e	V	+ 2.7	+ 7.0	+20	-10	10.1	M5e
1	-65.1	+10.0	-12	+ 3	10.2	K0	1	-59.3	-14.3	-13	-11	11.2	...	1	-72.8	-45.7	+23	+ 8	7.9	F0
2	-48.8	-53.2	- 6	+ 7	9.1	A2	2	-43.1	-32.6	-10	- 9	12.5	...	2	-56.9	+54.1	+ 5	-13	11.6	K0
3	-46.5	-18.0	- 1	+13	11.6	K:	3	-37.9	-27.3	+ 4	+10	12.2	...	3	-22.8	-33.1	-26	+11	9.5	F8
4	-14.8	+39.1	+19	-22	10.6	G:	4	-17.3	+30.8	+19	+10	11.6	...	4	- 7.8	+34.6	- 2	- 6	10.6	G5
5	+26.8	+31.5	- 4	+26	9.9	K0	5	+12.8	+14.1	-12	- 7	10.9	G:	5	+19.1	-16.7	+ 1	-21	11.8	...
6	+37.9	-20.7	+ 8	- 5	11.3	F0	6	+23.6	+17.4	+ 3	+ 6	12.0	...	6	+23.5	+41.2	+ 2	- 1	8.8	A5
7	+44.9	+36.7	- 2	- 6	9.8	K:	7	+55.5	-16.5	+ 2	- 5	9.0	G5	7	+56.5	-38.1	+ 2	+ 3	9.4	A2
8	+65.6	-25.4	- 1	-15	11.1	A5	8	+65.7	-36.8	+ 6	+ 6	11.8	...	8	+61.2	+ 3.7	- 6	+19	11.4	...
X Hya 302 M 8.0-13.6							RR Hya 342 M 8.6-14.5							S Car 150 M 4.5-9.9						
(Y)	09 ^h 30.7 ^m		-14° 15'		216° +28°			09 ^h 40.4 ^m		-23° 34'		225° +23°			10 ^h 06.2 ^m		-61° 04'		252° - 4°	
			- 8 - 4							- 8 - 3							- 5 + 1			
V	- 5.7	+ 5.9	-35	- 3	10.2	M7e	V	+ 7.8	+ 2.9	0	0	9.6	M4e	V	- 0.1	+ 2.3	-90	-58	9.4	M4e
1	-67.5	+ 9.5	+ 4	- 8	10.2	K0	1	-34.5	+20.9	0	+ 1	11.5	A-F	1	-45.3	-42.9	0	0	10.8	A:
2	-50.0	-63.5	- 4	+ 7	9.1	A2	2	-33.2	-15.6	+ 2	0	10.2	...	2	-39.2	+42.6	0	0	9.9	A0
3	-47.2	-21.7	+ 7	- 3	11.6	K:	3	-24.2	+24.6	- 3	- 3	11.2	...	3	+40.4	+50.9	0	0	9.5	A
4	-44.8	+60.0	- 6	+ 4	10.2	K2	4	- 5.7	- 3.7	+ 2	+ 2	12.3	...	4	+44.1	-50.6	0	0	10.0	A0
5	+33.8	+32.1	- 3	+15	9.9	K0	5	+13.3	-38.5	+18	-15	11.8	...							
6	+45.7	-25.7	+ 5	- 2	11.3	F0	6	+18.1	+25.7	-11	- 3	11.3	...							
7	+53.8	+37.5	+ 5	-12	9.8	K:	7	+31.9	-21.4	-21	+13	11.1	...							
8	+76.3	-31.2	- 9	- 1	11.1	A5	8	+34.5	+ 7.9	+14	+ 5	10.5	K0							
W Vel 394 M 8.4-14.0																				
(Y)	10 ^h 11.5 ^m		-53° 59'		249° + 2°															
			- 7 0																	
V	- 1.3	+ 0.6	- 6	+ 7	9.7	M7e														
1	-61.6	+51.1	- 2	- 6	11.0	...														
2	-34.0	-47.7	+ 2	- 6	11.4	F8														
3	+45.2	-43.6	- 2	- 6	11.2	A														
4	+50.4	+40.2	+ 2	+ 6	9.6	A														

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No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
S Sex 263 M 8.2-13.5							W Leo 385 M 8.9-14.8							W Cen 201 M 7.7-13.6						
	$10^h 29^m$		+00° 11'		216° +48°			$10^h 48^m$		+14° 15'		202° -61°		(Y)	$11^h 50^m$		-58° 42'		264° + 3°	
			-16 -10							-13 -9							-8 -2			
V	-3.4	+10.8	+2	-1	10.1	M3e	V	-7.7	-16.6	+30	+21	10.4	M7e	V	+2.7	+7.6	-28	+5	9.5	M3e M4e
1	-54.5	+10.3	-17	+17	11.7	...	1	-70.5	+5.9	+3	+47	9.5	A0	1	-70.4	+44.4	-2	+2	10.7	A1
2	-43.1	-65.5	+14	-6	9.9	F8	2	-62.4	-17.4	+14	+20	10.6	G0	2	-41.9	-19.4	+5	-1	9.2	M1e
3	-19.2	+34.9	-23	+12	11.6	...	3	-55.7	+44.8	-5	-39	9.2	K0	3	-32.7	+60.5	-7	-2	11.1	A0
4	-0.9	+36.8	+26	-24	11.4	...	4	-46.3	+22.6	+4	+9	10.0	G:	4	-31.1	-51.5	+5	+1	10.2	A
5	+10.1	-4.9	-22	+16	9.5	G5	5	-44.8	-51.8	-41	-59	11.2	...	5	+32.1	+27.3	-2	+2	9.5	G3
6	+23.4	+29.1	+12	-2	11.5	G5	6	-20.2	-29.5	+25	+22	10.7	K0	6	+36.4	-34.4	-17	-4	10.6	...
7	+36.5	-43.1	+8	-10	11.4	G5	7	+30.5	+45.4	-6	-14	11.6	...	7	+37.4	+29.4	-12	-1	10.5	A
8	+47.8	+2.5	+2	-3	10.6	K0	8	+40.8	-20.2	+6	+7	11.8	G:	8	+70.4	-56.3	+7	+4	10.8	A
							9	+49.1	-43.6	+17	+14	12.2	...							
							10	+53.4	-25.8	-22	-3	10.8	G:							
							11	+57.8	+51.0	-9	-7	11.6	...							
							12	+68.5	+18.4	+13	-24	10.6	K0.							
RZ Car 273 M 9.0-15.0							S Leo 190 M 9.4-14.5							R Com 362 M 7.3-14.6						
(Y)	$10^h 32^m$		-70° 12'		260° -11'			$11^h 05^m$		+06° 00'		220° +59°			$11^h 59^m$		+19° 20'		221° +77°	
			-8 +1							-13 -8							-21 -12			
V	-5.6	-0.1	+3	-1	9.6	M4e	V	-7.7	+2.4	-1	+2	10.8	M3e	V	+17.5	+13.8	+8	-17	10.4	M5e
1	-63.4	+39.3	0	+3	10.6	A2:	1	-51.6	+3.4	-10	+12	12.0	...	1	-52.2	-29.7	+10	-6	9.0	K5
2	-33.8	-47.6	0	-2	10.3	...	2	-43.7	+25.3	+42	-1	11.0	K0:	2	-46.4	+27.4	-28	-5	9.7	G5
3	+41.7	-50.6	0	+3	10.8	A	3	+1.6	+10.4	-26	-23	11.5	...	3	-33.0	+2.8	+5	+3	11.4	M:
4	+55.5	+58.9	0	-3	9.8	f:	4	-27.3	-18.2	-6	+12	12.4	...	4	-31.8	-20.3	-5	-6	11.1	K0
							5	+14.4	-60.5	-50	+41	9.8	F8	5	-1.8	+49.0	+17	+2	10.6	G5
							6	+35.7	+28.6	-5	+19	10.8	F0	6	-32.8	-38.9	+51	+24	10.0	F8
							7	+41.8	+14.9	-11	-7	11.2	K:	7	+63.7	+30.7	+6	0	11.1	G
							8	+73.3	-3.9	+56	-53	10.0	K0	8	-68.7	-21.0	-57	-24	9.4	G5
R UMa 302 M 6.7-13.4							RS Cen 164 M 7.8-13.9							SU Vir 210 M 8.4-14.5						
	$10^h 37^m$		+69° 18'		105° +45°		(Y)	$11^h 16^m$		-61° 20'		260° -1°			$12^h 00^m$		+12° 55'		236° +72°	
			-13 -8							-2 0							-14 -8			
V	-11.2	-12.6	-15	0	11.0	M3e M6e	V	-22.0	-26.5	+1	-4	13.8	M4e	V	-11.9	+14.1	-1	+15	10.0	M3e
1	-56.6	-17.0	+8	-6	10.7	F8	1	-74.5	-60.9	+16	-6	13.8	...	1	-39.6	-28.2	+39	-28	12.0	G0
2	-41.8	-29.8	-9	+4	9.8	K0	2	-74.5	+61.1	-16	+6	13.6	...	2	-29.2	+9.8	-8	+6	12.1	...
3	-34.8	-23.3	+1	+9	12.2	...	3	+72.5	-58.8	-18	+7	12.9	...	3	-26.6	-39.8	+7	-9	11.0	G5
4	-8.8	+22.0	+1	-7	11.5	...	4	+76.5	+56.6	+16	-6	14.1	...	4	-19.6	+29.2	+41	-14	11.3	G5
5	+25.2	+41.2	+29	+23	11.4	...								5	-14.1	-20.6	-79	-12	11.6	K2
6	+33.3	+22.4	-30	-15	11.0	G5:								6	+21.3	+29.2	-14	+7	11.8	G0:
7	+34.5	-11.2	-11	+1	10.5	K								7	+42.7	+25.8	-16	-1	8.9	A2
8	+49.0	-4.3	+12	-9	11.9	...								8	+65.1	-5.4	+30	-7	11.8	F8
V Hya 533 M 6.0-12.5							X Cen 315 M 7.0-13.9							R Crv 317 M 6.7-14.4						
	$10^h 46^m$		-20° 43'		238° +34°		(Y)	$11^h 44^m$		-41° 12'		259° +20°			$12^h 14^m$		-18° 42'		262° +43°	
			-11 -5							-13 -5							-12 -7			
V	-19.8	-7.5	-13	-1	10.7	N6e C63e	V	-59.0	-5.7	+9	+11	10.2	M5e M6e	V	+12.6	-11.2	+6	+3	10.8	M5e M7e
1	-72.4	-31.3	+31	-5	9.4	...	1	-61.8	+43.5	-30	+12	11.2	G:	1	-61.6	+16.9	-36	+7	11.9	...
2	-34.1	+34.5	-30	+7	11.5	...	2	-58.3	-11.1	+4	+10	10.7	F5:	2	-57.5	-43.6	+17	-12	11.1	...
3	-30.6	-7.3	+2	+1	11.1	...	3	-42.2	-59.5	-9	+6	10.6	f:	3	-52.1	+51.5	+10	+13	9.5	K:
4	-6.3	+30.0	-2	-3	11.4	...	4	-25.3	+41.1	+35	-28	11.3	G:	4	-24.7	-13.5	-12	+3	9.9	G:
5	+12.3	-41.6	-19	-2	10.6	...	5	+7.1	-65.8	+15	-5	10.9	F5:	5	-21.9	-43.0	-11	+15	11.4	...
6	+23.5	+17.7	+21	+1	12.4	...	6	+16.8	+57.0	+7	+17	10.2	G:	6	-20.6	+46.5	-32	-26	11.7	...
7	+38.4	-21.3	-14	+6	10.0	...	7	+81.7	+3.1	-11	-1	10.7	gk:	7	+5.9	-46.2	-36	+7	9.7	K0
8	+69.1	+19.4	+11	-5	9.4	...	8	+82.0	-10.5	-10	-11	11.4	...	8	+9.6	-9.6	-7	+5	10.9	...
														9	+41.0	+11.9	+30	-1	11.6	...
														10	+41.0	-19.3	+9	-15	10.2	...
														11	+68.8	-1.8	+9	-18	9.6	K:
														12	+72.1	-42.2	+5	-14	11.6	...

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
SS Vir 355 M 6.0-9.6							R Vir 146 M 6.2-12.1							RU Vir 437 M 9.0-14.2						
	$12^h 20^m$		+01° 19'		259° +63°			$12^h 33^m$		+07° 32'		265° +69°			$12^h 42^m$		+04° 42'		271° +66°	
			-18	-11						-14	-8						-14	-8		
V	-2.5	+5.5	+9	+37		Ne 9.6 C63e	V	-1.4	+14.7	-22	+13		10.2 M4e M8e	V	-1.1	+3.9	+16	-22		10.1 R3ep
1	-77.5	-4.4	+48	-98		8.6 F8	1	-69.8	+19.7	+12	-16		11.3 G0:	1	-56.7	+29.3	+20	+6		10.6 K2
2	-42.7	-1.8	-10	+43		9.4 F8	2	-67.2	-23.4	-5	+7		11.0 G5:	2	-28.6	-47.0	-37	+1		10.5 F8
3	-6.7	-24.3	-38	+55		11.3 ...	3	-25.4	+45.4	-41	+20		10.2 K0	3	-13.1	+6.1	+17	-7		10.6 K2
4	+18.4	-38.4	0	0		9.0 K2	4	-16.0	+32.9	+27	-12		11.7 ...	4	+9.2	+33.9	+39	-9		11.6 K2
5	+24.5	+17.5	-27	-23		11.8 ...	5	-10.9	-40.8	+7	+1		11.3 ...	5	+16.4	+7.3	-76	+11		10.3 K0
6	+32.7	+9.8	+25	+17		11.9 ...	6	+7.8	-51.8	-1	0		11.0 G	6	+33.6	-28.6	-23	+15		11.2 F8
7	+51.3	+41.6	+1	+6		10.4 G0	7	+29.9	+16.0	+16	-4		11.4 ...	7	+39.2	-1.0	+60	-16		9.6 G0
							8	+37.6	+3.1	-15	+3		12.0 ...							
							9	+54.5	-43.6	-1	-8		11.8 ...							
							10	+59.5	+42.5	+1	+9		10.6 K0							
T CVn 290 M 8.6-12.6							RS UMa 260 M 8.3-14.8							U Vir 207 M 7.5-13.5						
	$12^h 25^m$		+32° 03'		128° +85°			$12^h 34^m$		+59° 02'		91° +59°			$12^h 43^m$		+06° 06'		277° +68°	
			-15	-7						-14	-3						-14	-8		
V	-3.2	+15.3	+39	-7		10.5 M6e	V	-6.6	+17.7	-12	-8		9.7 M4e M6e	V	+4.0	-25.3	+4	+9		10.0 M5e
1	-71.5	-53.9	+28	+4		10.6 K0	1	-63.0	+30.8	+16	-12		11.7 ...	1	-42.3	-29.9	+18	-11		10.9 K0
2	-66.1	+45.0	-28	-4		9.7 K0	2	-55.8	-38.5	+7	+6		11.2 K:	2	-33.7	+27.7	-33	+8		9.7 K2
3	+23.2	-22.5	-33	+4		11.2 G:	3	-44.1	+15.7	-17	+3		11.3 G0	3	-26.8	+31.4	+9	-8		10.8 K:
4	+32.5	+26.4	+10	+10		11.7 ...	4	-33.6	-33.7	+2	+7		10.3 K0	4	-2.9	-28.2	+6	+12		10.5 A5
5	+34.0	-19.4	+5	-8		10.0 F8	5	-27.3	-26.8	-8	-4		10.8 G5	5	+3.7	+45.5	+10	-5		11.0 G:
6	+47.9	+24.4	-18	-6		11.3 F8	6	+0.1	+33.0	+3	+7		10.6 G:	6	+9.9	-43.4	-69	+8		10.3 G:
							7	+0.2	-39.4	-12	-15		9.6 F2	7	+37.8	-28.3	+44	-9		11.6 K:
							8	+23.3	-18.5	+1	+31		10.8 G:	8	+54.4	+25.2	+14	+5		10.9 K:
							9	+27.6	+46.4	+10	-5		11.8 G:							
							10	+47.0	+16.9	-13	+6		11.0 G:							
							11	+62.7	-24.5	+10	-25		10.7 G:							
							12	+63.9	+38.6	+1	0		11.7 ...							
Y Vir 219 M 8.3-15.0							S UMa 226 M 7.4-12.3							RV Vir 268 M 10.2-15.0						
	$12^h 28^m$		-03° 52'		265° +58°			$12^h 39^m$		+61° 38'		90° +56°			$13^h 02^m$		-12° 38'		278° +49°	
			-18	-11						-15	-2						-13	-8		
V	-5.5	+28.0	-6	-4		10.6 M3e M5e	V	-1.9	+11.0	+5	+6		10.2 S1.5.3e SS.9e	V	+1.3	-8.3	-11	+19		12.2 M5e
1	-40.8	-29.0	-6	+24		11.4 G:	1	-74.5	+19.9	-7	-33		10.2 G:	1	-66.9	-20.5	+61	-21		9.0 K0
2	-30.6	+44.8	+5	-16		10.0 G0	2	-49.0	+45.0	+52	-9		10.3 G0	2	-63.5	-39.2	-38	-4		11.4 ...
3	-21.3	-39.5	+1	-8		11.3 G:	3	-41.8	-25.0	-17	+17		8.8 F8	3	-21.6	-45.0	+4	-2		12.7 ...
4	+17.8	-27.6	-2	+23		10.3 G5	4	-33.7	-12.8	-10	+4		11.7 ...	4	-13.4	+21.5	-27	+1		12.4 ...
5	+36.7	-27.4	-3	-8		9.7 K0	5	-15.2	+37.8	-19	+21		10.6 F:	5	-6.6	-5.3	0	+27		11.2 ...
6	+38.2	-31.3	+5	-16		11.1 K5	6	+10.8	-59.2	-27	0		9.7 K0	6	+1.3	+31.9	+7	-6		12.6 ...
							7	+19.5	+25.5	-19	+1		11.1 G:	7	+4.4	-8.0	-28	-17		10.5 ...
							8	+22.8	-57.0	-15	-24		10.0 K0	8	+8.2	-25.4	-11	+29		11.9 ...
							9	+31.0	-5.2	+33	+9		11.7 F8	9	+11.1	-18.2	-62	+21		12.1 ...
							10	+41.1	-8.4	+35	-6		11.9 ...	10	+11.2	+48.5	+16	+8		11.4 ...
							11	+41.4	+16.3	+8	+34		10.1 G:	11	+67.8	-15.7	+9	-34		11.1 K2
							12	+47.6	+21.1	-15	-13		11.4 ...	12	+68.0	-15.7	+14	-33		10.8 ...
T UMa 257 M 6.6-13.4							V CVn 192 SPa 6.8-8.2							V CVn 192 SPa 6.8-8.2						
	$12^h 31^m$		+60° 02'		92° +58°			$13^h 15^m$		+46° 03'		71° +71°			$13^h 15^m$		+46° 03'		71° +71°	
			-16	-3						-15	-3						-15	-3		
V	+10.6	+3.1	-4	-12		9.9 M3e M6e	V	-9.4	+20.9	-28	-40		9.8 M4e M6e	V	-9.4	+20.9	-28	-40		9.8 M4e M6e
1	-65.8	-46.8	-15	+8		10.5 G0	1	-59.9	+31.5	0	0		8.1 K2	1	-59.9	+31.5	0	0		8.1 K2
2	-46.5	-8.6	+20	+5		11.3 G0:	2	+18.8	-51.6	0	0		8.4 K0	2	+18.8	-51.6	0	0		8.4 K0
3	-42.6	+24.9	-22	-3		12.1 ...	3	+41.1	+20.1	0	0		10.0 K2	3	+41.1	+20.1	0	0		10.0 K2
4	-38.2	+46.8	+18	-10		9.2 K5														
5	-30.8	-45.2	-12	-6		10.8 ...														
6	+50.9	-37.8	+7	-7		10.4 ...														
7	+55.0	+27.3	-4	+12		11.0 F:														
8	+56.4	+39.4	+8	+1		9.8 G5														

*Reference star No. 1 is BD+46° 1861. It's $\mu_\alpha = +0^s 0159$, $\mu_\delta = -0^s 080$ (2nd Greenwich Catalogue, p. 152, 1935). To make it an average background star, it's motion was deducted before the solution was made.

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
R Hya 386 M 4.0-10.0							T Cen 91 SRa 5.5-9.0							R CVn 328 M 7.3-12.9						
(Y)	13 ^h 24.3 ^m		-22° 46'		283° +38°			13 ^h 36.0 ^m		-33° 06'		283° +27°			13 ^h 44.7 ^m		+40° 02'		46° +72°	
			-12 - 9							-12 -10							-13 - 3			
V	+10.9	-25.0	-19	+12	9.5	M7e	V	- 8.8	+17.1	-14	+21	9.7	M3e	V	-15.0	+ 5.8	- 1	+13	10.9	M8e
1	-66.7	+53.1	+31	- 4	10.8	...	1	-44.0	-44.5	+12	- 2	10.3	G:	1	-45.5	-11.3	-19	- 7	10.1	K2
2	-67.0	-69.1	-85	+15	10.0	G3	2	-38.3	+46.5	-12	+12	10.9	G:	2	-44.8	+21.9	+ 7	+23	9.8	K2
3	-28.8	+42.2	+17	+ 2	10.8	g5:	3	-38.0	-29.3	+ 2	+ 9	10.6	K	3	-39.1	- 6.5	-30	+18	10.6	...
4	-28.3	-32.8	+37	-12	10.9	G0:	4	-30.4	+ 6.9	- 2	-19	9.0	K2	4	-38.8	+ 6.7	+41	-34	11.4	...
5	+15.5	+45.0	- 4	+11	11.0	...	5	+ 9.7	+45.2	+ 4	+20	10.8	G	5	+19.4	-18.7	+33	-15	9.1	K2
6	+52.0	-26.1	+47	-16	10.7	g:	6	+34.8	+ 1.4	+ 8	+ 6	10.6	G	6	+42.1	-18.3	- 1	- 7	11.1	K:
7	+53.5	-58.4	- 1	+13	9.7	K2	7	+48.2	+17.8	+ 2	-20	10.7	K	7	+44.5	- 0.6	+16	+11	10.7	K0
8	+69.7	+46.2	-48	- 8	10.6	F5:	8	+58.1	-44.0	-14	- 6	10.2	G	8	+62.2	+26.8	-48	+12	10.0	K0
S Vir 378 M 6.3-13.2							T Cen 91 SRa 5.5-9.0							RX Cen 328 M 8.7-15.0						
	13 ^h 27.8 ^m		-06° 41'		290° +53°		(Y)	13 ^h 36.0 ^m		-33° 06'		283° +27°		(Y)	13 ^h 45.6 ^m		-36° 27'		284° +24°	
			-16 -11							-12 -10							-11 - 9			
V	+15.3	- 6.9	0	-16	10.1	M6 M7e	V	- 3.0	+ 4.4	- 9	+15	9.3	M3e	V	-37.3	-21.7	- 1	-17	10.3	M5e
1	-40.2	-41.8	+10	-12	10.6	F8	1	-87.3	+ 9.6	+17	- 5	10.7	F2	1	-70.8	-12.2	- 2	- 5	11.4	G0
2	-15.4	+ 0.6	+91	+55	9.9	...	2	-75.6	- 2.7	-38	+ 2	10.9	F8	2	-61.5	+37.9	- 6	-13	11.0	A5:
3	-13.7	+34.7	- 3	-13	8.4	K0	3	-42.6	-63.1	+29	-11	10.3	F5	3	-44.4	-52.1	+ 2	0	10.8	F5
4	- 9.9	+ 1.7	- 4	-10	10.9	K:	4	-12.8	+56.4	- 8	+14	11.0	A0	4	-40.4	+24.3	+ 6	+ 8	12.1	g
5	- 1.7	+13.4	-10	- 2	9.6	K5	5	+23.9	- 9.2	+10	+ 5	11.1	g:	5	+24.8	-34.6	0	- 7	11.6	g5:
6	- 0.9	+36.3	-83	-18	10.9	...	6	+59.8	+ 4.5	+ 5	-30	10.7	g	6	+45.8	+36.5	+ 6	- 4	10.6	g5K
7	+30.6	-54.0	-10	+12	10.5	F:	7	+64.7	+68.6	-14	+20	10.6	G0:	7	+69.9	+55.7	- 7	+ 9	10.2	f8
8	+51.2	+ 9.1	+10	-12	9.1	G5	8	+70.0	-64.0	- 1	+ 4	10.2	G0	8	+76.6	-55.5	0	+ 2	11.1	f:
RV Cen 446 M 7.0-10.8							RT Cen 256 M 8.1-13.6							Z Boo 281 M 8.2-15.0						
(Y)	13 ^h 31.1 ^m		-55° 58'		277° + 5°		(Y)	13 ^h 42.5 ^m		-36° 22'		284° +24°			14 ^h 01.7 ^m		+13° 58'		328° +65°	
			- 7 - 5							-13 -10							-12 - 6			
V	- 2.4	- 0.4	+ 3	+15	13.4	N	V	+ 3.4	+ 3.9	+10	- 5	9.8	...	V	- 8.7	-12.0	- 4	+ 7	10.6	M5e
1	-73.4	+ 6.2	+ 6	- 2	11.6	...	1	-64.3	+58.7	- 6	+ 1	10.7	...	1	-54.5	+36.0	+21	+ 6	10.4	K0
2	-70.8	-13.5	-40	+ 2	10.5	g	2	-50.5	-64.2	-11	+16	10.7	...	2	-51.0	-14.7	- 2	+25	11.7	...
3	-30.1	+45.2	+18	+17	12.5	A2:	3	-36.2	+32.3	+ 9	+10	11.0	f	3	-31.1	+26.4	-46	+24	9.7	F0
4	-38.5	-52.5	+12	-20	11.2	f	4	-35.6	-10.2	+ 8	-27	10.6	g	4	-28.7	-18.4	- 3	+ 7	11.2	K:
5	+40.7	+24.4	+ 6	+21	12.1	...	5	+23.7	+ 5.8	- 2	+ 6	10.3	F5	5	-20.5	+50.6	+29	-47	10.3	K0
6	+41.3	+57.7	-30	-40	11.3	...	6	+35.3	-21.4	+14	- 9	11.0	g:	6	-18.1	-31.7	+ 1	-16	10.1	G:
7	+59.4	-57.3	+ 6	- 1	10.6	...	7	+59.9	-61.9	-11	+20	10.2	g	7	+28.5	-44.8	- 5	+19	11.8	...
8	+61.4	-10.2	+18	+19	10.7	...	8	+67.8	+60.9	- 1	-18	10.2	...	8	+54.3	+30.2	- 4	+16	11.7	...
T UMi 314 M 8.5-15.0							W Hya 382 SRa 7.7-11.6							Z Vir 307 M 9.9-15.0						
	13 ^h 32.6 ^m		+73° 57'		86° +44°			13 ^h 43.4 ^m		- 52°		287° +32°			14 ^h 05.0 ^m		-12° 50'		300° +44°	
			- 9 + 2							- 9 - 8							-16 -13			
V	+ 0.6	- 5.4	- 2	- 3	10.7	M4e	V	+ 3.6	-11.0	-40	-50	9.3	M8e	V	+ 3.3	- 2.0	+ 6	+ 3	10.4	M5e
1	-60.3	+40.0	-29	+26	11.2	K:	1	-58.6	+10.9	+46	+ 6	11.0	...	1	-57.2	+ 4.8	+ 4	0	10.1	K5
2	+59.9	+55.1	+31	-27	11.3	G:	2	-58.5	-32.4	-50	-24	10.2	...	2	-44.1	+23.2	+ 5	+16	10.1	K5
3	-50.7	- 7.2	+13	+ 2	11.9	K:	3	-47.6	+53.4	- 8	- 1	11.0	...	3	-22.4	-53.1	+17	- 4	11.1	G5
4	-48.2	-12.7	-15	- 2	12.1	...	4	-26.8	-33.8	+12	+18	10.4	...	4	-17.8	+ 5.3	+31	+ 8	11.1	K:
5	- 2.0	-33.8	- 6	+ 1	11.5	...	5	+29.3	+28.0	-20	- 8	10.5	...	5	-11.3	- 2.2	+14	0	9.8	K5
6	+27.6	-24.4	-24	-18	11.6	G	6	+35.3	- 9.8	+ 9	+ 5	10.6	...	6	- 4.7	- 9.1	-70	-20	9.0	G0
7	+38.1	-37.8	+15	-16	11.7	...	7	+63.3	+30.3	-17	+ 3	11.5	...	7	+ 7.1	+22.7	+24	-49	10.4	G5
8	+44.9	+24.0	+21	-16	11.9	...	8	+63.6	-46.7	+29	0	10.9	...	8	+12.9	+29.7	-25	+ 5	10.9	G0
9	+49.6	-41.1	+16	- 3	11.7	...								9	+24.1	+25.8	-38	+20	10.1	F8:
10	+51.7	+37.9	-22	+16	12.1	...								10	+33.6	-39.2	+38	- 5	11.0	...
														11	+36.8	- 3.5	- 8	+14	9.5	F8
														12	+43.0	- 4.3	+10	+14	11.9	...

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
RU Hya 334 M 7.2-14.3							R Cam 270 M 7.9-14.4							RR Boo 195 M 8.0-12.8						
(Y)	14 ^h 05.8 ^m		-28'	25'	292'	+30'	(Y)	14 ^h 25.1 ^m		+84'	17'	87'	+33'		14 ^h 43.2 ^m		+39'	44'	330'	+62'
			- 8	- 7						-10	+ 6						-11	- 1		
V	+ 3.5	+ 0.5	+13	-18	10.5	M6e	V	+10.4	-14.1	+ 2	- 7	10.3	S2.9e:	V	-17.4	+ 2.1	- 3	0	9.7	M3e
1	-67.9	-41.5	-47	-35	11.0	F:	1	-80.5	-48.5	-12	+ 9	11.3	...	1	-71.0	+56.9	+ 5	-12	9.7	G0
2	-63.3	+50.3	-20	+10	10.4	F:	2	-66.9	+44.5	- 5	- 7	11.3	...	2	-68.6	-27.0	+ 7	- 5	10.2	K2
3	-40.3	+25.9	+ 2	+18	11.9	...	3	-18.0	+36.6	+10	-10	11.4	...	3	-42.6	+14.5	(-51	+76)	10.6	G5
4	-28.3	- 3.0	+25	+ 8	12.8	...	4	- 4.5	+ 6.4	+ 7	+ 7	8.4	K2	4	-41.8	-25.8	-13	+14	10.4	K0
5	+24.0	+ 3.5	-24	-11	11.0	...	5	+32.2	+27.9	-13	+ 9	9.8	A0	5	-29.3	+25.6	+ 2	+ 4	9.4	M0:
6	+27.9	-21.0	+ 6	+ 9	12.0	...	6	+35.8	-20.4	+15	- 1	10.9	K:	6	-28.7	- 9.3	-16	+ 7	9.5	K0
7	+68.6	-53.8	+15	-18	11.5	A0	7	+43.5	-33.9	- 2	-12	9.2	F8	7	-13.8	-23.1	+14	+ 8	12.3	...
8	+79.5	+39.7	+ 2	-17	11.8	...	8	+58.4	-12.6	0	+ 4	11.2	...	8	+12.1	-24.9	- 9	+ 5	12.2	...
R Cen 547 M 5.4-11.8							V Boo 258 SRa 7.0-11.3							U Boo 200 SRb 9.8-13.0						
(Y)	14 ^h 09.4 ^m		-59'	27'	281'	+ 1'	(Y)	14 ^h 25.7 ^m		+39'	18'	34'	+65'		14 ^h 49.7 ^m		+18'	06'	348'	+58'
			-13	-12						-13	- 2						-11	- 5		
V	- 0.4	+ 3.1	+ 3	+ 2	9.4	M5e	V	+ 9.7	-13.2	+42	- 6	10.1	M6e	V	- 3.0	+ 4.5	+ 5	-24	10.7	M4e
1	-75.7	-46.9	- 4	+ 5	10.3	A:	1	-60.6	-11.5	- 4	+34	10.8	G0:	1	-46.2	-18.5	+20	+50	10.2	G5
2	-71.1	+47.9	+ 5	- 5	9.3	K	2	-48.4	-43.4	-43	-17	9.9	K0	2	-31.2	-19.1	+40	+76	10.0	F2
3	-64.9	+60.1	- 4	+ 5	9.1	G2	3	-21.9	+10.0	+131	-48	9.2	G5	3	-21.8	- 0.5	-70	-167	11.8	...
4	-81.9	-61.2	+ 4	- 5	9.5	G:	4	-22.2	+40.0	-84	+32	11.6	G:	4	- 9.4	+55.9	+10	+11	11.4	G:
U UMi 326 M 7.4-12.7							R Boo 223 M 6.7-12.8							RT Lib 252 M 8.2-14.6						
(Y)	14 ^h 15.2 ^m		+67'	15'	76'	+49'	(Y)	14 ^h 32.8 ^m		+27'	10'	4'	+65'		15 ^h 00.8 ^m		-18'	21'	309'	+33'
			-12	+ 4						-11	- 4						- 8	- 9		
V	-12.4	+ 5.5	+ 1	+11	10.6	M6e	V	-21.9	- 2.0	-22	-26	10.2	M5e	V	-13.9	+ 1.2	+ 4	+ 1	10.9	M4pe
1	-57.8	+31.5	+26	-26	11.2	G0	1	-48.7	-15.5	0	- 3	10.5	F3	1	-54.0	- 8.2	+ 8	-31	10.9	K:
2	-51.8	+35.2	- 2	-10	10.9	K0	2	-36.3	+39.3	+ 3	-16	11.4	F3	2	-36.6	-11.8	+ 4	+ 1	11.3	K:
3	-51.7	+36.3	-23	+29	11.4	F3	3	-12.4	+55.4	-10	- 6	10.5	C0	3	-33.1	-32.7	- 8	-29	11.0	K:
4	-25.5	+ 4.6	- 1	+ 3	11.1	K	4	- 0.1	-56.5	-13	- 7	11.5	...	4	-27.3	-19.8	- 3	- 3	9.6	K0
5	-19.0	+14.1	0	+ 4	10.9	F8	5	+ 8.5	+25.9	+ 4	-25	11.1	K0	5	-30.7	- 3.6	+ 7	- 7	11.6	G0
6	+35.2	- 5.6	- 5	-35	11.8	...	6	+16.7	-55.2	+13	-10	11.2	...	6	+36.6	-13.0	0	- 5	11.0	M
7	+37.5	+22.4	+ 2	+ 4	8.6	K2	7	-72.2	+ 6.6	-17	+16	10.6	K:	7	+40.1	-11.6	- 4	+ 8	10.2	G5
8	+38.4	+ 1.5	-25	-25	9.9	F5								8	+43.6	+51.1	- 3	+ 4	11.4	K2
9	+45.5	-46.1	+41	- 8	10.4	F8	V Lib 255 M 9.0-15.0							RT Lib 252 M 8.2-14.6						
10	+49.2	-21.3	-13	+14	11.6	K:	(Y)	14 ^h 34.8 ^m		-17'	14'	305'	+37'	(Y)	15 ^h 00.8 ^m		-18'	21'	309'	+33'
S Boo 271 M 8.0-13.8										-12	-12						- 6	- 6		
(Y)	14 ^h 19.5 ^m		+54'	16'	62'	+58'	V	- 0.3	- 9.0	- 5	-14	10.1	M5e	V	- 0.7	- 0.9	+ 1	- 6	11.1	M4pe
			-13	+ 2																
V	- 5.2	- 2.5	-25	-18	9.8	M5e	1	-46.8	-22.0	-23	- 8	9.3	F8:	1	-66.9	-57.1	+ 4	- 2	11.8	G
1	-43.5	- 4.4	+ 2	+ 7	10.0	K0	2	-39.4	-48.7	+11	+ 1	10.5	...	2	-37.6	- 2.7	+ 1	- 6	12.7	K0
2	-40.4	-38.6	+36	+10	11.1	G0	3	-37.9	+ 5.1	-33	+ 5	10.4	K0	3	-19.0	+45.2	- 6	- 2	12.0	G
3	-31.7	+40.1	-18	-29	11.1	G5	4	-15.8	+26.8	+18	+ 3	8.6	K2	4	-13.6	-37.3	+ 1	+ 6	12.2	K:
4	-31.0	+13.4	+10	- 3	8.9	A	5	- 4.3	+51.2	+26	- 1	10.6	K0:	5	-19.2	- 6.3	- 5	+ 6	11.6	G0
5	-30.3	+13.5	+14	+ 1	8.9	G0	6	+ 7.0	-31.2	-14	- 4	9.0	F8:	6	+25.6	+59.4	+ 4	+ 8	11.5	K2
6	-12.9	+10.5	-44	+ 7	10.6	G5	7	+59.1	+56.6	-11	- 7	9.5	G:	7	-33.9	+53.8	+ 1	0	11.4	K2
7	+10.3	-45.5	-68	+31	10.4	K0	8	-78.1	-37.8	+25	+10	8.6	A:	8	-58.5	-63.4	0	-14	11.9	G5
8	+15.3	-43.8	+27	-25	10.2	G5														
9	+25.8	+46.6	+34	+21	10.6	G0														
10	+24.8	-19.6	-14	- 9	10.5	K0														
11	+37.9	+47.5	+ 4	- 4	10.5	G0														
12	+75.6	-19.6	-11	-15	8.4	K0														

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
Y Lib 275 M 7.6-14.7							RU Lib 317 M 7.4-14.2							X CrB 241 M 8.5-14.2						
		$15^h 06.4^m$	-05° 38'		322° +41'				$15^h 27.7^m$	-14° 59'		319° +31'				$15^h 45.2^m$	+36° 33'		25° +50°	
			-10 -10							-7 -8							-9 0			
V	+21.6	+2.9	0	-4	10.3	M5e	V	+4.6	-13.5	-4	+5	10.6	M6e	V	+2.2	-17.9	-5	-4	10.4	M7e
1	-62.4	+30.5	-16	+7	11.7	...	1	-52.9	+27.0	+6	-5	10.6	K	1	-46.0	+1.9	-20	-8	9.5	K0
2	-47.9	-25.8	-12	+7	10.5	G5	2	-37.2	+41.5	-3	+9	9.4	K0	2	-29.5	-8.6	+9	+12	10.9	G
3	-42.4	-35.2	+27	-2	10.3	G5	3	-33.4	-19.4	-14	-3	10.4	F2	3	-14.7	-51.9	+11	-4	11.4	...
4	-24.5	-38.1	+1	-12	9.9	K0	4	-5.4	-46.2	+10	-1	11.1	K	4	+4.6	+47.0	+10	+8	10.6	...
5	+22.7	+32.9	-5	-4	8.7	K0	5	+22.5	+56.6	-14	-14	9.0	K0	5	+14.3	-39.3	-20	-8	10.2	K2
6	+41.0	+29.8	+19	-16	11.3	...	6	+24.8	-44.0	+14	+13	10.9	K0	6	+71.3	+50.9	+10	0	10.1	...
7	+46.1	-18.2	-16	+7	11.6	...	7	+33.7	+23.2	+11	...	10.4	F2							
8	+67.4	+24.1	+2	+13	10.1	F8	8	+48.0	-38.9	-11	-9	9.8	F2							
S Lib 193 M 8.0-13.0							R Nor 490 M 6.5-13.9							V CrB 358 M 6.9-12.2						
		$15^h 15.7^m$	-20° 02'		312° +39°				$15^h 28.8^m$	-49° 10'		295° +3°				$15^h 46.0^m$	+39° 55'		30° +50°	
			-10 -12				(Y)			-6 -10							-8 -1			
V	+2.1	-16.7	+5	-8	10.3	M2e	V	+0.5	-2.2	+5	+2	10.0	M3e	V	-14.2	-14.3	+12	-19	9.6	C62
1	-49.8	+29.5	-27	+14	11.2	...	1	-50.6	+51.6	+15	+5	11.4	A	1	-52.8	-24.7	+18	-42	11.0	F5
2	-47.7	+15.6	-6	+5	11.0	...	2	-47.5	-41.7	-3	+11	10.5	G	2	-35.4	+5.0	-16	+15	11.7	K
3	-36.1	-38.7	+36	+19	10.4	G0	3	-25.8	-49.7	-4	-10	10.9	A5	3	-20.4	+3.5	-12	-6	8.5	A0
4	-10.7	-27.9	-19	-26	9.8	G0	4	-24.8	+50.0	-8	-5	11.1	F8	4	-8.2	-45.2	+9	+31	10.1	...
5	-6.1	-36.4	+17	-12	10.2	K	5	+13.5	-37.7	+3	0	10.3	K2	5	-4.0	+30.5	+1	+2	11.4	K0
6	+38.3	+40.7	+46	-42	10.1	G0	6	+41.7	-50.9	+13	+16	10.8	...	6	+8.6	+24.1	-5	+7	11.2	F2
7	+55.1	-30.6	-33	+19	10.0	F0	7	+45.6	-59.6	+4	-1	10.6	B8	7	+34.5	+38.2	+22	-19	9.4	K0
8	+57.0	+47.8	-13	+22	10.3	G0	8	+47.9	+36.2	-20	-15	10.4	F5	8	+77.7	-31.4	-27	+11	10.9	...
RS Lib 217 M 7.0-13.0							S UM1 327 M 8.0-12.9							R Ser 357 M 5.7-14.4						
		$15^h 18.5^m$	-22° 33'		311° +27°				$15^h 33.5^m$	-78° 58'		81° +36°				$15^h 46.1^m$	-15° 26'		354° +45°	
			-8 -11							-7 +8							-7 -4			
V	+12.4	+1.4	+37	0	10.9	M8e	V	-17.9	-17.5	-38	+1	9.9	M9e	V	-11.7	+13.3	+9	-41	10.7	M8e
1	-65.0	-9.9	+28	+7	8.0	A0	1	-62.9	-38.0	-5	-10	11.4	...	1	-41.4	-20.8	-35	-16	11.3	G
2	-55.3	-2.2	-72	-47	10.4	G0	2	-47.3	+26.5	-16	-14	11.0	...	2	-38.1	+3.9	+3	-3	11.6	...
3	-50.4	-31.8	+35	+32	9.8	K	3	-40.8	+31.0	+17	+16	11.3	...	3	-31.2	-5.9	+15	+8	11.3	K
4	-48.3	+17.3	+10	+8	10.6	G0	4	-38.7	-49.4	+4	+9	10.3	G5	4	-17.5	-34.1	+9	-13	10.7	K0
5	+36.4	+3.0	+9	+18	8.9	K0	5	+18.9	+33.5	+1	+4	11.1	G	5	-17.0	+68.9	+17	+12	11.0	F2
6	+55.6	+18.5	+9	-17	11.5	G	6	+35.1	-50.7	+2	+2	10.6	...	6	-4.0	-32.6	-9	+12	10.9	F
7	+62.1	+25.9	-29	-8	10.3	G	7	+53.8	+42.3	-4	-2	10.0	K0	7	-28.4	-31.8	-3	-11	12.1	...
8	+64.9	-20.8	+10	+7	11.5	G	8	+81.9	+4.8	+1	-8	10.6	F0	8	+34.4	-16.8	+12	0	10.1	G0
RS Lib 217 M 7.0-13.0							U Lib 226 M 9.0-15.0							R Lup 236 M 9.4-14.0						
(Y)		$15^h 18.5^m$	-22° 33'		311° +27°				$15^h 36.2^m$	-20° 52'		316° +25°		(Y)		$15^h 47.0^m$	-36° 00'		307° +12°	
			-9 -11							-7 -10							-4 -6			
V	+13.7	+1.6	+45	-3	8.9	M6e	V	-8.8	-2.4	+19	+12	10.2	M3e	V	+0.8	0.0	+12	+8	11.2	M5e
1	-71.6	-10.9	-29	+24	8.0	A0	1	-54.4	-20.7	-11	-10	10.2	K	1	-73.2	-2.3	-8	-7	11.5	...
2	-60.9	-2.4	-72	-40	10.4	G0	2	-44.3	-3.9	+51	+23	11.1	G	2	-38.9	+48.8	-3	+10	9.8	K0
3	-55.6	-35.0	+32	+15	9.8	K	3	-36.5	+31.3	-8	+31	11.0	...	3	-31.6	-47.2	+14	-4	11.6	...
4	-53.2	+19.1	-11	+1	10.6	G0	4	-21.8	-18.8	-45	-52	11.0	...	4	-21.6	+8.9	-4	+2	11.8	...
5	+40.1	+3.3	+6	+15	8.9	K0	5	-2.3	-24.5	-8	-12	9.7	K0	5	+13.6	-28.7	+7	+11	10.9	...
6	+61.2	+20.4	+9	-10	11.5	G	6	+42.8	+8.0	-42	-91	8.8	K	6	+37.0	+27.9	-24	+12	11.0	...
7	+68.4	+28.5	-26	-6	10.3	G	7	+57.2	-3.9	-9	+31	10.9	...	7	+56.1	-10.5	-14	+1	12.2	...
8	+71.5	-23.0	+11	+1	11.5	G	8	+59.3	+32.5	+50	+60	10.8	K	8	+58.7	+3.7	+31	-23	12.1	...

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
R Lib 242 M 9.8-15.0						Z CrB 251 M 8.8-15.5						R Her 318 M 8.2-15.0								
15 ^h 47.9 ^m -15° 56' 322° +27'						15 ^h 52.1 ^m +29° 32' 14° +48'						16 ^h 01.7 ^m +18° 38' 0° +43'								
- 6 - 8						- 8 - 1						- 7 - 4								
V + 3.9 - 3.4 +29 +14 11.4 M5e						V -24.2 -16.2 -11 +40 10.3 M4e						V - 8.2 - 3.8 - 1 + 4 10.6 M6e								
1	-54.5	-42.1	+ 2	+ 5	11.8	K:	1	-57.6	+18.2	- 7	-25	11.7	...	1	-63.5	+43.7	- 1	+11	11.4	F8
2	-53.6	+32.8	- 1	+17	11.4	K:	2	-41.7	-15.5	+36	-47	11.7	...	2	-40.4	-21.2	-11	+ 9	10.1	G0
3	-36.5	-26.2	+ 8	+ 2	11.4	...	3	-39.1	-24.4	0	+13	11.6	...	3	-38.2	+12.1	-20	+20	10.8	K0
4	-32.6	+36.2	-10	-24	11.1	F8	4	-36.8	-23.6	- 1	+1'	11.0	K:	4	-13.5	-27.5	+ 8	+ 6	10.5	G0
5	+28.9	+38.4	-10	-15	11.8	...	5	-27.6	+13.9	-19	+38	11.1	K0:	5	- 9.3	-40.4	- 4	-45	10.9	F8
6	+41.2	-44.6	-11	-13	11.0	K:	6	-14.4	+36.0	- 9	+ 4	11.5	...	6	- 6.6	-31.7	+20	+ 2	10.4	F0
7	+53.4	- 9.1	+ 1	+ 6	11.3	G:	7	+ 8.6	-15.1	-12	- 6	10.6	G0	7	- 0.5	+46.6	+ 8	- 5	11.0	...
8	+53.7	+14.7	+20	+23	11.3	G:	8	+28.5	-45.0	- 7	+21	11.4	...	8	+14.2	-33.6	- 6	+38	9.0	K0
						9 +33.2 +35.2 +20 - 2 11.3 ...						9 +20.5 +44.3 +10 -27 11.3 ...								
						10 +39.6 +30.7 +15 -14 11.3 ...						10 +22.0 +28.3 + 2 0 11.3 ...								
						11 +42.3 + 3.0 0 0 11.2 K:						11 +47.6 - 2.2 - 8 + 1 10.0 G5								
						12 +65.0 -13.4 -16 + 1 10.1 ...						12 +67.4 -18.3 + 2 -10 11.6 ...								
R Lib 242 M 9.8-15.0						RZ Sco 159 M 8.2-12.8						U Ser 238 M 7.8-14.0								
(Y) 15 ^h 47.9 ^m -15° 56' 322° +27'						15 ^h 58.6 ^m -23° 50' 318° +19'						16 ^h 02.5 ^m +10° 12' 350° +39'								
- 6 - 9						- 4 - 8						- 7 - 6								
V + 4.3 - 3.8 +20 +11 10.5 M5e						V + 5.4 -16.7 - 2 -18 10.4 M4e						V + 5.4 -16.8 - 4 +43 10.6 M3e								
1	-60.0	-46.4	+ 1	+ 9	11.8	K:	1	-55.7	-26.3	-10	- 2	10.5	F2	1	-63.7	+20.4	- 4	+13	9.1	A0
2	-59.0	+36.1	- 3	+17	11.4	K:	2	-52.8	+25.3	- 9	+ 3	11.8	g	2	-45.1	-17.5	0	+14	10.5	K:
3	-40.1	-28.9	+12	+ 2	11.4	...	3	-28.9	-47.2	0	+ 3	10.2	G5	3	-40.1	+38.0	+ 4	-27	9.9	F8
4	-35.9	+39.8	- 9	-28	11.1	F8	4	-10.6	+26.5	+19	- 3	11.8	G	4	+ 0.3	-54.2	+ 4	-40	9.7	F8
5	+31.8	+42.4	-17	-14	11.8	...	5	+27.6	+31.3	+ 1	+ 5	10.8	gk:	5	-34.7	-37.9	- 4	+26	10.4	K:
6	+45.4	-49.1	-18	-13	11.0	K:	6	+37.4	-32.3	+ 9	- 4	10.9	G5	6	+53.9	-22.0	-42	- 6	9.7	G5
7	+58.8	-10.0	+ 6	+ 2	11.3	G:	7	+40.8	-16.1	+ 1	+ 3	10.2	A1	7	-60.0	-29.2	-42	-20	10.6	F8
8	+59.1	+16.2	+29	+25	11.3	G:	8	+42.1	+38.9	-11	- 5	10.9	g5							
RR Lib 277 M 7.8-15.0						RZ Sco 159 M 8.2-12.8						X Sco 200 M 10.2-14.6								
15 ^h 50.7 ^m -18° 01' 321° +25'						(Y) 15 ^h 58.6 ^m -23° 50' 318° +19'						15 ^h 02.7 ^m -21° 16' 320° +21'								
- 5 - 7						- 4 - 8						- 5 -10								
V +16.7 -15.2 +16 + 5 10.8 M4e						V + 7.3 -18.4 -11 -11 9.7 M4e						V + 1.2 + 1.2 + 7 + 1 11.0 M2e								
1	-54.1	+24.1	- 3	- 4	12.9	...	1	-60.1	-29.0	-10	+ 8	10.5	F2	1	-61.2	+42.3	-15	-18	9.8	K5
2	-50.4	-50.5	+ 8	- 4	10.1	K0	2	-56.9	+27.9	-10	- 3	11.8	g	2	-60.2	-39.1	+ 3	+12	11.4	...
3	-27.5	-25.1	- 5	+ 7	11.5	G0	3	-30.5	-52.0	- 2	- 1	10.2	G5	3	-19.3	+39.4	-15	+10	11.3	...
4	-23.7	+54.0	0	...	12.0	...	4	-10.5	+29.2	+22	- 4	11.8	G	4	- 6.5	-16.3	- 3	- 4	10.6	...
5	+20.0	+23.5	+27	+31	12.4	....	5	+21.6	+34.5	+ 1	+ 8	10.8	gk:	5	+ 1.7	+22.0	+ 6	+13	11.5	...
6	+41.9	-29.9	- 2	- 2	10.9	K0	6	+42.5	-35.7	+10	-14	10.9	G5	6	+34.9	-42.2	-17	+ 3	11.7	...
7	+47.1	+45.2	-22	-28	11.2	K:	7	+46.2	-17.8	+ 2	+ 7	10.2	A1	7	+47.2	+ 1.3	- 7	- 5	10.8	...
8	+46.7	-41.3	- 1	- 1	12.0	...	8	+47.7	+42.9	-13	- 1	10.9	g5	8	+63.4	- 7.4	+17	-11	10.3	...
RR Lib 277 M 7.8-15.0						Z Sco 352 M 8.7-13.4						RU Her 484 M 6.9-14.3								
(Y) 15 ^h 50.7 ^m -18° 01' 321° +25'						16 ^h 00.1 ^m -21° 28' 320° +21'						16 ^h 06.1 ^m +25° 20' 9° +44'								
- 6 - 9						- 5 - 9						- 7 - 3								
V - 1.8 - 3.4 +15 - 1 9.8 M4e						V - 7.2 - 6.9 + 1 - 1 10.1 M7e						V -13.1 - 6.1 -16 - 9 10.6 M7e								
1	-75.6	-42.4	+ 1	-24	10.1	K0	1	-71.8	+ 6.6	-12	- 7	11.3	...	1	-66.7	-29.9	0	0	9.0	F0
2	-50.4	-14.3	-13	- 7	11.5	G0	2	-67.3	-20.2	0	- 1	10.7	...	2	+32.7	-24.4	0	0	8.4	M0
3	-46.5	+72.8	- 6	+19	12.0	F8	3	-27.9	- 9.5	+ 6	+ 3	10.3	K5	3	+34.0	+54.3	0	0	9.0	F0
4	-18.0	+ 5.3	+18	+12	8.7	K2	4	- 7.0	+21.8	+ 6	+ 5	11.4	...							
5	+26.0	-19.5	+ 8	+ 2	10.9	K0	5	+11.3	+38.5	+ 5	+ 2	11.0	...							
6	+31.5	+63.4	-12	-31	11.2	K:	6	+30.5	-14.6	- 2	- 5	10.9	F0:							
7	+47.2	- 0.1	- 7	+25	10.6	K0	7	+63.2	-34.6	- 4	+ 3	11.6	...							
8	+85.8	-65.2	+11	+ 3	10.1	G5	8	+69.0	+12.0	+ 1	0	11.1	K:							

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
S Sco 177 M 9.9-15.5							W CrB 238 M 7.8-14.3							Y Sco 352 M 10.9-15.0						
	$16^h 11.7^m$		-22° 39'		321° +18°			$16^h 11.8^m$		+18° 03'		27° +45°			$16^h 23.8^m$		-19° 08'		326° +18°	
			- 3 - 6							- 7 + 1							- 2 - 5			
V	+ 7.8	+ 3.6	- 2	+ 1	11.6	M3e	V	- 0.6	0.0	- 4	+ 1	9.7	M2e M4e	V	+11.7	+ 6.6	+11	+11	12.6	...
1	-47.1	-33.4	+ 5	-18	11.2	...	1	-65.1	+23.7	-25	- 4	10.8	K2	1	-55.4	+26.6	- 3	+ 3	11.6	...
2	-43.2	+ 5.1	+39	-29	11.6	...	2	-45.5	- 3.1	+12	- 7	11.5	K2	2	-53.4	- 7.7	-71	-29	10.8	...
3	-29.8	-44.0	+24	- 3	12.0	...	3	-42.9	-22.3	-26	+14	11.5	K0	3	-44.3	-59.5	+45	+28	12.5	...
4	-19.9	+15.3	-69	+50	11.1	...	4	-27.9	-27.1	+17	+ 5	11.4	G5	4	-21.5	+14.7	+28	- 3	11.0	...
5	+26.9	+43.6	+13	- 8	12.2	...	5	-27.1	+57.0	+16	-21	9.6	K0	5	+15.6	+46.1	-17	+18	11.8	...
6	+27.5	- 6.4	-12	- 7	11.7	...	6	-23.1	-18.2	+ 6	+13	10.0	F8	6	+29.3	-46.4	+33	+11	12.9	...
7	+41.6	+47.7	+17	-13	11.4	...	7	+20.2	+ 8.5	+ 9	+13	10.2	F8	7	+56.6	+19.3	- 9	-18	13.3	...
8	+44.0	-27.9	-17	+22	11.6	...	8	+22.2	-31.5	-34	-55	10.9	K	8	+72.9	- 5.2	- 7	-10	12.9	...
S Sco 177 M 9.9-15.5							9	+35.8	-12.6	+22	+ 8	11.0	G0	T Oph 367 M 8.8-14.2						
(Y)	$16^h 11.7^m$		-22° 39'		321° +18°		10	+47.9	+25.8	- 6	+ 1	10.8	K		$16^h 28.9^m$		-15° 55'		329° +19°	
			- 3 - 6				11	+50.8	+20.8	+ 7	+11	10.9	G0				- 3 - 7			
V	+ 8.5	+ 3.7	+ 1	+ 8	10.5	M3e	12	+54.5	-20.8	+ 3	+21	11.2	G0	V	-16.3	-13.0	+ 7	+ 8	9.4	M(6)e
1	-51.6	-38.2	0	-16	11.2	...	V Oph 298 M 7.3-11.0													
2	-47.7	+ 7.7	+40	-34	11.6	...		$16^h 21.2^m$		-12° 12'		330° +23°								
3	-32.4	-49.5	+29	+ 2	12.0	...				- 5 -10										
4	-22.1	+16.0	-69	+48	11.1	...	V	- 1.4	-25.3	+23	+14	9.6	C63e N3e	1	-60.2	-13.5	+13	-10	11.6	...
5	+29.2	+48.3	+13	- 7	12.2	...	1	-75.2	+50.1	-21	+18	11.3	...	2	-48.7	+24.4	-52	+32	11.7	...
6	+30.4	- 6.9	-13	+ 2	11.7	...	2	-35.7	-41.2	+13	0	10.7	G	3	-40.3	+35.9	+20	-27	10.4	K0
7	+45.4	+53.0	+16	- 8	11.4	...	3	-32.9	+14.2	- 2	0	9.5	K0	4	-14.9	-37.5	+19	+ 5	11.4	...
8	+48.8	-30.3	-16	+12	11.6	...	4	-29.6	-47.6	+10	-17	11.2	K	5	+13.6	-28.0	+15	+ 5	10.8	G
R Sco 223 M 9.8-15.5							5	+12.8	+20.5	+ 6	+15	10.2	G0	6	+40.0	-30.4	-47	0	11.0	K
	$16^h 11.7^m$		-22° 42'		321° +18°		6	+28.4	+48.2	+17	-33	9.8	F8	7	+47.8	+30.3	-11	-18	10.2	K0
			- 3 - 6				7	+63.5	-32.5	+21	+ 9	11.0	...	8	+62.7	+18.8	+43	+14	11.9	...
V	+ 6.8	- 5.3	+10	+ 7	11.3	M3e	8	+68.9	-11.8	-44	+ 8	10.8	K0	SS Her 107 M 8.5-13.2						
1	-47.1	-33.4	+ 5	-18	11.2	...	V Oph 298 M 7.3-11.0								$16^h 28.1^m$		+07° 04'		350° +32°	
2	-43.2	+ 5.1	+39	-29	11.6	...				- 5 - 9							- 4 - 5			
3	-29.8	-44.0	+24	- 3	12.0	...								V	+12.2	- 8.3	+ 4	+ 3	10.4	M3e
4	-19.9	+15.3	-69	+50	11.1	...														
5	+26.9	+43.6	+13	- 8	12.2	...	V	+ 4.8	- 3.7	+13	+10	11.6	C63e N3e	1	-66.0	+ 0.6	+ 4	- 8	11.2	...
6	+27.5	- 6.4	-12	- 7	11.7	...	1	-71.5	+61.8	+14	+ 2	11.3	...	2	-56.2	- 5.0	-14	+13	12.0	...
7	+41.6	+47.7	+17	-13	11.4	...	2	-70.3	-68.2	- 7	- 5	11.7	...	3	-23.1	+31.6	0	+ 2	10.3	K0
8	+44.0	-27.9	-17	+22	11.6	...	3	-29.4	+40.2	0	- 2	9.5	K0	4	-18.3	-42.3	+10	- 7	11.3	...
R Sco 223 M 9.8-15.5							4	-26.5	-27.9	- 7	+ 4	11.2	K	5	+30.6	+38.1	- 2	+ 1	10.5	K0
	$16^h 11.7^m$		-22° 42'		321° +18°		5	+17.8	-50.5	- 1	-12	11.1	...	6	+39.0	-15.4	- 4	- 3	10.9	...
			- 3 - 6				6	+21.1	+46.6	+16	- 4	10.2	G0	7	+41.6	-29.5	+ 9	- 4	11.3	...
V	+ 7.6	- 6.2	+ 8	+ 4	10.2	M3e	7	+76.3	-12.3	+15	+12	11.0	...	8	+52.4	+22.4	- 2	+ 6	10.6	A
1	-51.6	-37.6	+ 3	-15	11.2	...	8	+82.5	+10.4	-30	+ 3	10.8	K0	S Oph 234 M 9.0-14.7						
2	-47.7	+ 8.1	+42	-37	11.6	...	U Her 406 M 7.0-13.4								$16^h 28.5^m$		-16° 57'		328° +19°	
3	-32.6	-49.2	+23	0	12.0	...				- 5 - 3							- 3 - 6			
4	-22.0	+16.2	-68	+52	11.1	G								V	+ 5.2	+ 2.5	- 5	0	10.6	M5e
5	+29.3	+48.0	+11	- 7	12.2	...	V	+17.4	- 4.5	-11	- 9	10.2	M7e M8e							
6	+30.3	- 7.2	-13	- 4	11.7	...	1	-56.4	+50.2	- 6	+ 6	9.0	K2	1	-54.5	-23.1	-22	+ 1	10.0	K5
7	+45.5	+52.5	+15	- 7	11.4	K	2	-47.5	+24.2	+ 9	+ 4	11.0	F8	2	-41.3	+40.0	+ 6	+15	11.6	...
8	+48.7	-30.8	-13	+18	11.6	...	3	-43.5	-12.0	- 6	- 9	10.5	F8	3	-32.4	+29.1	+ 7	-10	11.5	...
R Sco 223 M 9.8-15.5							4	-12.4	- 4.0	+ 2	+13	10.8	F5	4	-30.8	-25.1	+ 9	- 7	12.0	...
	$16^h 11.7^m$		-22° 42'		321° +18°		5	+ 9.4	+ 5.0	+10	-16	9.4	K5	5	+10.7	27.9	+ 6	+ 7	12.1	...
			- 4 - 7				6	+36.3	-29.9	- 3	0	10.3	K0	6	+42.3	+15.4	+12	+19	10.5	...
V	+ 7.6	- 6.2	+ 8	+ 4	10.2	M3e	7	+42.1	- 2.9	-12	-11	10.9	K	7	+44.6	+ 3.8	-25	-25	11.0	...
1	-51.6	-37.6	+ 3	-15	11.2	...	8	+72.0	-30.6	+ 5	+13	11.0	K	8	+61.4	-32.2	+ 7	- 1	11.6	...
2	-47.7	+ 8.1	+42	-37	11.6	...	S Oph 234 M 9.0-14.7								$16^h 28.5^m$		-16° 57'		328° +19°	
3	-32.6	-49.2	+23	0	12.0	...											- 3 - 6			
4	-22.0	+16.2	-68	+52	11.1	G								V	+ 5.2	+ 2.5	- 5	0	10.6	M5e
5	+29.3	+48.0	+11	- 7	12.2	...														
6	+30.3	- 7.2	-13	- 4	11.7	...								1	-54.5	-23.1	-22	+ 1	10.0	K5
7	+45.5	+52.5	+15	- 7	11.4	K								2	-41.3	+40.0	+ 6	+15	11.6	...
8	+48.7	-30.8	-13	+18	11.6	...								3	-32.4	+29.1	+ 7	-10	11.5	...
R Sco 223 M 9.8-15.5														4	-30.8	-25.1	+ 9	- 7	12.0	...
	$16^h 11.7^m$		-22° 42'		321° +18°									5	+10.7	27.9	+ 6	+ 7	12.1	...
			- 4 - 7											6	+42.3	+15.4	+12	+19	10.5	...
V	+ 7.6	- 6.2	+ 8	+ 4	10.2	M3e								7	+44.6	+ 3.8	-25	-25	11.0	...
1	-51.6	-37.6	+ 3	-15	11.2	...								8	+61.4	-32.2	+ 7	- 1	11.6	...
2	-47.7	+ 8.1	+42	-37	11.6	...	U Her 406 M 7.0-13.4													
3	-32.6	-49.2	+23	0	12.0	...														
4	-22.0	+16.2	-68	+52	11.1	G														
5	+29.3	+48.0	+11	- 7	12.2	...														
6	+30.3	- 7.2	-13	- 4	11.7	...														
7	+45.5	+52.5	+15	- 7	11.4	K														
8	+48.7	-30.8	-13	+18	11.6	...														

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
R UMi 324 SRa 8.8-11.0						RR Oph 293 M 8.1-14.9						SS Oph 180 M 7.8-14.5								
$16^h 31.3^m$ $+72^\circ 30'$ $72^\circ +36'$						(Y) $16^h 43.2^m$ $-19^\circ 17'$ $328^\circ +14'$						$16^h 52.6^m$ $-02^\circ 36'$ $344^\circ +22'$								
- 5 + 9						- 3 - 7						- 3 - 8								
V	+16.6	-10.7	+15	+ 9	9.7	M7e	V	+ 1.5	- 0.4	- 2	- 2	10.0	M3e	V	+11.5	+ 6.0	+ 4	+ 5	9.0	M2e
1	-64.1	+16.8	-13	+31	9.8	G5	1	-60.7	+50.6	- 3	- 7	13.1	...	1	-46.1	+12.7	+ 2	- 6	10.5	K0
2	-56.9	-25.4	+22	-11	9.4	A2	2	-55.5	-60.8	+ 9	- 2	11.5	...	2	-33.3	+63.3	- 4	+ 7	9.0	F0
3	-47.8	+51.4	- 6	-34	10.8	G0	3	-42.0	+20.7	+ 7	- 8	11.8	...	3	-19.5	-37.9	+21	- 7	8.5	A0
4	-27.3	-25.7	- 3	+14	10.3	K0	4	-34.0	-21.0	-13	+17	10.4	G:	4	- 4.1	-19.6	-19	+ 7	9.3	K0
5	+39.5	+19.5	+14	- 2	9.6	K2	5	+11.6	+39.1	-15	- 8	10.9	...	5	+47.0	+15.7	+ 2	0	9.5	K2
6	+45.3	+27.2	+ 4	+ 5	9.1	A2	6	+12.4	-48.5	0	-24	12.2	...	6	+56.0	-34.2	- 2	0	8.7	F0
7	+46.9	-28.5	-16	0	9.7	G0:	7	+73.7	-35.8	+ 3	+ 9	10.7	G							
8	+64.4	-35.3	- 1	- 3	10.6	A0	8	+94.6	+55.7	+11	+23	11.7	...							
W Her 280 M 7.7-14.4						S Her 307 M 7.0-13.8						RV Her 205 M 9.0-15.5								
$16^h 31.7^m$ $+37^\circ 33'$ $27^\circ +41'$						$16^h 47.4^m$ $+15^\circ 07'$ $1^\circ +33^\circ$						$16^h 56.7^m$ $+31^\circ 22'$ $20^\circ +36^\circ$								
- 5 + 1						- 3 - 4						- 4 0								
V	+14.4	- 9.8	- 2	+22	10.9	M3e	V	- 0.9	- 0.5	+18	+18	10.4	M7e	V	+22.5	- 8.5	- 1	0	10.4	M2e
1	-67.9	-11.2	-14	-22	11.5	G0	1	-54.2	+ 3.2	- 5	+ 1	11.0	K:	1	-62.3	-25.8	-31	+85	10.1	K0
2	-41.0	+38.0	- 6	+10	9.9	K2	2	-44.3	-17.5	- 1	+11	8.8	K2	2	-52.9	-44.7	+20	-50	10.3	G0
3	-14.6	+50.6	+ 4	+ 1	11.0	K0	3	- 9.9	+60.8	+ 6	-12	10.6	...	3	-35.7	+18.7	+12	-21	10.3	...
4	-11.6	-38.5	+16	+11	11.5	A2	4	+ 5.4	- 4.7	- 3	+15	10.5	...	4	- 8.4	+35.7	- 1	-14	9.7	K5
5	+24.5	+ 8.5	+ 7	+ 4	9.5	K5	5	+ 8.8	-31.0	- 5	-56	9.9	K0	5	+15.5	-30.8	-19	+ 2	9.9	G:
6	+26.9	-12.6	+ 5	+ 7	11.3	G5	6	+27.2	-33.3	+ 5	+ 8	10.6	G0	6	+31.2	+17.0	- 9	+12	11.2	...
7	+35.1	+15.3	- 5	-15	10.7	G5	7	+32.6	+31.9	- 1	+11	11.7	...	7	+55.1	+35.6	- 1	+22	9.6	K2
8	+48.6	-50.2	- 7	+ 4	11.4	G0	8	+34.4	- 9.4	+ 3	+22	10.8	G:	8	+57.5	- 5.9	+29	-36	8.8	F0
R Dra 246 M 6.9-13.0						RS Sco 320 M 6.2-13.0						RT Sco 448 M 7.0-14.6								
$16^h 32.4^m$ $+66^\circ 58'$ $65^\circ +38^\circ$						(Y) $16^h 48.4^m$ $-44^\circ 56'$ $309^\circ - 2^\circ$						(Y) $16^h 56.8^m$ $-36^\circ 47'$ $316^\circ + 2^\circ$								
- 7 +11						- 2 - 9						- 3 -11								
V	- 7.4	+ 0.1	- 9	+ 6	9.9	M7e	V	+18.3	-21.0	+21	-19	9.5	M8e	V	+ 2.3	+ 1.1	- 3	+ 9	9.1	M6e
1	-35.2	+ 8.1	+18	+15	9.2	F8	1	-66.0	-59.9	0	+11	11.4	...	1	-78.1	+40.2	- 6	+ 1	10.6	G:
2	-30.2	- 5.9	+ 1	-33	9.4	K0	2	-65.6	+61.2	- 2	- 6	10.9	...	2	-72.5	-60.0	-15	-10	10.4	G2
3	-23.8	+22.2	-19	-18	10.1	G5	3	-24.4	+12.6	- 3	- 2	10.4	G5:	3	-19.8	+41.8	- 1	+ 2	10.4	A1
4	+22.8	-55.0	- 1	+33	10.2	F8	4	-19.6	-10.2	+ 5	- 3	10.9	A0	4	-11.8	-12.3	+ 8	+ 8	10.8	A2
5	+27.0	+14.8	+12	- 9	10.3	F0	5	+14.5	+17.2	- 1	+10	10.2	A0	5	+17.9	- 5.5	- 8	+ 7	10.9	...
6	+59.4	+15.8	-12	-24	9.8	F8	6	+33.3	-24.4	- 5	0	10.7	...	6	+39.4	-62.3	- 1	- 4	10.6	...
							7	+62.8	-42.8	0	- 2	11.0	...	7	+56.5	+ 8.6	0	+ 7	9.7	A
							8	+64.9	+6.2	+ 5	- 2	10.8	...	8	+68.4	+49.6	- 6	-10	10.1	G
RR Oph 293 M 8.1-14.9						RR Sco 280 M 5.0-12.4						SY Her 117 M 8.4-14.0								
$16^h 43.2^m$ $-19^\circ 17'$ $328^\circ +14'$						(Y) $16^h 57.3^m$ $-30^\circ 25'$ $320^\circ + 7'$						$16^h 57.3^m$ $-22^\circ 37'$ $10^\circ +32^\circ$								
- 4 -10						- 3 - 9						- 4 - 3								
V	-20.1	+18.4	+ 8	0	10.0	M3e	V	+ 2.3	+ 1.3	-14	- 6	9.3	M8e	V	+ 5.3	- 4.9	+24	- 8	10.1	M1e
1	-58.3	+34.8	+ 4	+ 2	10.0	A5	1	-78.1	+31.4	+ 2	+ 5	10.5	A1	1	-48.1	+ 7.1	- 3	+ 2	9.8	G0
2	-52.5	- 0.3	-14	-10	10.4	G:	2	-69.0	-58.7	-11	- 7	10.1	G8:	2	-45.2	-20.9	- 5	- 4	9.9	K2
3	-40.6	-30.8	+ 2	- 3	10.5	G:	3	-39.2	-11.0	+ 5	+ 4	10.2	A0	3	-31.3	-16.3	- 7	+ 3	10.3	A5
4	-31.6	+10.9	+ 7	- 8	10.8	G:	4	-17.6	+51.5	+ 3	- 2	9.5	M0	4	+ 4.0	+40.1	- 6	- 9	9.6	G:
5	+ 8.4	+21.2	-10	-11	10.2	K:	5	+23.9	+44.1	- 2	- 3	10.8	G0	5	+20.7	-23.1	-28	-18	9.4	G5
6	+45.3	-13.8	- 1	+ 2	10.7	G0	6	+35.5	-23.3	+ 4	+ 1	12.5	...	6	+44.1	+38.9	+ 9	+ 7	11.3	K0
7	+61.5	+13.4	- 2	+17	10.5	A2	7	+71.6	+28.8	- 4	- 1	9.9	A3	7	+55.8	-25.8	+25	+19	10.4	K5:
8	+67.8	-35.6	+13	- 9	10.0	G5:	8	+72.9	-62.8	+ 2	+ 3	11.0	K:							

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
R Oph 302 M 7.0-13.6							Z Oph 348 M 7.6-13.2							RT Oph 425 M 8.6-15.5						
		$17^{\text{h}} 02.0^{\text{m}}$		$-15^{\circ} 58'$		$334^{\circ} +13'$			$17^{\text{h}} 14.5^{\text{m}}$		$+01^{\circ} 37'$		$351^{\circ} +20'$			$17^{\text{h}} 51.9^{\text{m}}$		$+11^{\circ} 11'$		$4^{\circ} +16'$
				- 2 - 6							- 2 - 6							0 - 4		
						M4e														
V	-17.2	+ 5.3	-21	- 4	10.4	M6e	V	- 8.5	+ 0.5	- 5	+10	10.6	M2e	V	+ 2.6	+10.6	- 8	- 3	10.5	M7e
1	-65.3	+29.6	+10	+ 8	10.2	A0	1	-69.6	-47.2	+20	+ 6	10.2	...	1	-43.0	-27.5	- 6	+ 2	10.4	G:
2	-54.9	+46.4	- 3	+16	11.6	A	2	-60.7	+ 3.3	-13	-14	11.4	...	2	-41.7	+21.5	+ 3	- 1	10.9	G0:
3	-52.9	-55.5	+17	+ 9	9.2	A0	3	-59.0	+39.2	-10	+ 7	11.6	...	3	-10.5	- 5.5	+ 4	+ 2	11.8	...
4	-33.9	-11.0	-24	-33	11.1	K0	4	- 9.2	+25.6	+ 3	+ 1	11.7	...	4	- 1.5	+28.3	- 1	- 2	9.5	A0
5	+45.6	-55.4	+ 5	+10	11.5	...	5	+ 8.8	+27.1	+ 9	+ 4	10.1	K0	5	+15.5	+47.9	- 5	+ 3	11.5	K0
6	+50.0	+50.3	- 7	-24	9.8	F0	6	+58.8	+ 2.6	+21	+ 2	10.9	...	6	+17.1	-46.1	+ 1	+ 3	10.7	K0
7	+53.4	-35.2	+ 2	+15	11.8	...	7	+62.0	-25.9	-18	- 2	9.3	K:	7	+23.0	+17.2	+ 3	0	9.8	A:
8	+58.0	+30.8	0	+ 1	10.1	A0	8	+68.9	-24.7	-12	- 4	11.6	...	8	+41.0	-35.8	+ 1	- 6	11.6	...
R Oph 302 M 7.0-13.6							RS Her 219 M 7.4-12.9							T Dra 422 M 7.2-13.5						
(Y)		$17^{\text{h}} 02.0^{\text{m}}$		$-15^{\circ} 58'$		$334^{\circ} +13'$			$17^{\text{h}} 17.5^{\text{m}}$		$+23^{\circ} 01'$		$13^{\circ} +28'$			$17^{\text{h}} 54.9^{\text{m}}$		$+58^{\circ} 14'$		$54^{\circ} +29'$
				- 2 - 7							- 2 - 2							0 + 6		
						M4e														N0e
V	+ 1.3	- 2.0	-30	-17	9.1	M6e	V	+ 1.0	- 7.9	-23	- 3	10.6	M5e	V	+ 4.0	+ 4.2	- 4	+28	12.2	C8e
1	-51.4	+25.8	+ 4	- 7	10.2	A0	1	-71.4	-36.8	+11	- 5	9.9	K:	1	-64.0	+18.5	- 1	+ 1	10.5	K0
2	-39.7	+44.1	- 7	+ 1	11.8	A:	2	-60.0	+29.1	-19	+18	10.9	F8	2	-55.8	+40.6	0	+15	11.2	...
3	-39.0	-68.3	+ 2	- 1	9.2	A0	3	-31.1	+36.0	+16	-12	10.3	G5	3	-39.6	- 9.9	- 3	-11	10.8	G0
4	-28.7	-58.7	+ 1	+ 6	9.5	K2	4	-25.8	-42.4	- 8	0	11.6	...	4	-10.8	-47.8	+ 5	- 5	10.9	K0
5	+ 5.5	-16.7	+ 1	+10	11.5	A:	5	+29.9	-32.7	0	- 8	9.6	K0	5	+18.1	-48.6	+ 4	+12	11.2	G0
6	+10.3	+59.0	+ 5	+ 6	10.0	K2	6	+38.0	-15.6	- 4	+13	9.1	A0	6	+45.8	+47.9	+ 5	- 4	9.5	K0
7	+58.5	-10.0	- 3	-15	10.7	K:	7	+59.8	+27.5	- 4	- 5	9.8	K:	7	+51.2	-47.4	- 6	+ 4	10.5	K0
8	+84.6	+24.7	- 2	0	10.1	A0	8	+60.6	+34.9	+ 7	- 1	10.1	K:	8	+55.2	+46.6	- 3	-12	10.6	F5
RT Her 298 M 8.5-15.5							RU Oph 202 M 8.6-14.2							RY Her 221 M 8.3-14.1						
		$17^{\text{h}} 06.8^{\text{m}}$		$+27^{\circ} 11'$		$16^{\circ} +32'$			$17^{\text{h}} 28.1^{\text{m}}$		$+09^{\circ} 30'$		$0^{\circ} +20'$			$17^{\text{h}} 55.4^{\text{m}}$		$+19^{\circ} 29'$		$13^{\circ} +19'$
				- 2 - 1							- 2 - 5							0 - 3		
						M4e														M4e
V	+ 9.4	- 4.1	+ 4	- 9	11.5	M4e	V	+11.2	- 7.4	-21	+ 1	10.0	M3e	V	+ 1.5	+ 8.6	+ 7	+ 7	10.0	M6e
1	-70.9	+48.1	- 4	+ 1	11.2	K0:	1	-50.0	+32.3	- 6	+23	11.4	K0	1	-54.1	-38.4	-14	+15	10.2	K0
2	-49.1	-13.9	0	-10	11.9	...	2	-44.3	-13.4	0	- 3	11.1	G0	2	-39.6	-11.2	0	+ 5	9.9	F8
3	-34.1	-35.0	- 4	+ 6	11.8	K:	3	-21.2	-36.3	-12	-21	11.2	F8	3	-31.4	+10.3	+24	-25	9.9	G0
4	- 4.3	+17.4	+ 8	+ 3	10.9	K0	4	-19.9	+36.5	+ 6	0	10.2	K0	4	-25.5	+36.7	-10	+ 5	11.2	...
5	+32.2	+12.7	-14	+ 7	11.3	G:	5	+20.6	+20.7	- 1	0	10.5	K5	5	+16.6	-34.1	+21	-30	10.7	K0
6	+32.3	-26.1	- 9	- 2	11.1	K0	6	+21.4	-38.7	+10	+ 6	9.7	K5	6	+31.0	-38.7	- 7	+10	10.4	(G):
7	+42.9	-42.3	+13	+ 6	11.9	...	7	+44.3	+29.9	-11	-23	10.1	F2	7	+40.9	+32.3	-21	+13	8.6	G5
8	+51.0	+39.1	+ 9	-11	11.1	G5	8	+49.2	-31.0	+ 2	+17	8.6	F2	8	+62.1	+43.1	+ 7	+ 7	9.3	F2
RW Sco 389 M 8.8-15.0							U Ara 225 M 7.7-14.1							V Dra 278 M 9.5-14.7						
(Y)		$17^{\text{h}} 08.3^{\text{m}}$		$-33^{\circ} 19'$		$320^{\circ} + 2'$	(Y)		$17^{\text{h}} 45.7^{\text{m}}$		$-51^{\circ} 39'$		$308^{\circ} -14'$			$17^{\text{h}} 56.3^{\text{m}}$		$+54^{\circ} 53'$		$50^{\circ} +29'$
				- 2 - 8							- 1 -14							0 + 6		
						M5e														M4e
V	+ 6.0	- 2.0	+11	+21	11.4	M5e	V	+ 0.7	- 2.9	- 7	+ 4	8.3	M5e	V	- 9.4	-19.9	0	- 4	10.6	M4e
1	-72.0	-41.4	-11	+13	11.1	...	1	-87.6	-70.5	+11	- 8	9.9	B9	1	-52.9	-43.2	-10	-31	10.5	G5
2	-64.2	+52.3	+ 1	-39	11.1	...	2	-72.8	+52.5	-10	0	10.6	G2	2	-51.4	-22.7	+ 3	- 4	10.7	G0
3	-23.3	+22.6	+ 5	- 4	12.1	A	3	- 6.9	+42.5	- 2	+ 9	9.5	G8	3	-27.4	+41.2	+18	+ 2	10.0	K:
4	-10.8	-26.3	+ 5	+30	11.8	A	4	+36.4	+28.7	- 6	+42	9.5	G8	4	-11.5	+41.6	-11	+33	10.1	G5
5	+12.7	-28.3	+ 5	-137	10.5	M	5	+65.4	-72.5	-11	+ 9	11.0	G2	5	+29.8	+38.0	-24	-19	10.9	G5
6	+15.0	+47.3	+ 4	+ 9	11.7	...	6	+65.5	+19.3	+17	-51	8.7	K0	6	+36.2	-52.6	+21	+24	10.8	K:
7	+66.3	-60.9	0	+95	11.6	A:							7	+37.1	-14.4	-14	+11	11.5	...	
8	+76.3	+32.6	-10	+34	11.3	G5:							8	+40.3	+12.0	+17	-16	10.0	K2	

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
R Pav 230 M 7.5-13.8						W Lyr 196 M 7.5-13.0						T Ser 340 M 9.1-15.5								
(Y) 18 ^h 03.3 ^m -63° 38' 298° -21'						18 ^h 11.5 ^m +36° 38' 31° +21'						18 ^h 23.9 ^m +06° 14' 4° +6'								
0 -12						+ 1 + 2						+ 1 - 3								
V -32.2 +15.0 -21 +30 11.1 M4e						V + 9.2 + 2.6 + 7 + 7 9.8						V - 2.2 + 1.1 - 2 + 6 10.8 M7e								
1	-66.3	+ 7.5	- 3	+ 2	10.8	G5	1	-42.1	-38.2	+16	- 1	10.3	A5	1	-36.6	+41.4	- 2	- 1	11.0	F:
2	-62.2	-60.0	- 6	-18	10.9	F5	2	-40.2	+55.7	+ 2	-23	9.1	K0	2	-37.0	+ 8.7	+ 2	0	10.4	A5
3	-42.2	+69.0	0	+12	11.9	g	3	-37.4	+ 7.3	- 1	- 9	9.4	F8	3	-3.8	-55.6	0	+ 1	10.4	F0
4	-12.7	-20.6	+ 9	+ 3	10.8	A5	4	-20.6	-33.9	-18	+33	10.7	K0	4	+ 9.2	+27.2	0	+ 2	10.9	A2
5	+22.7	+49.4	- 5	+ 5	10.9	gk	5	+ 9.9	-35.5	-11	-52	10.1	G5	5	+47.6	+12.3	0	- 1	10.8	A5
6	+45.2	-30.3	- 8	+ 1	11.3	k	6	+37.0	+55.3	- 6	+14	9.9	K0	6	+51.6	-34.0	0	- 1	11.2	...
7	+55.2	+42.2	+ 7	-19	11.0	g:	7	+42.4	-41.0	+13	+20	9.0	K0							
8	+60.3	-57.1	+ 5	+13	12.0	z:	8	+51.0	+30.3	+ 5	+18	10.6	A0							
T Her 165 M 7.1-13.6						RY Oph 150 M 7.6-13.8						SV Dra 257 M 9.1-15.0								
18 ^h 05.3 ^m +31° 00' 25° +21'						18 ^h 11.6 ^m +03° 40' 0° + 5°						18 ^h 31.1 ^m +49° 18' 45° +22'								
0 0						+ 1 - 5						+ 2 + 4								
V + 8.4 + 6.5 - 2 +11 10.2 M4e						V + 0.5 -13.1 - 8 +13 10.4 M5e						V +10.1 + 7.7 + 8 + 4 10.4 M7e								
1	-58.8	+27.2	- 2	- 9	11.2	F5	1	-37.1	+40.0	+ 2	+ 9	10.0	A:	1	-45.2	-22.4	+19	-28	10.6	G5
2	-44.5	+10.2	+ 4	+ 6	10.4	F2	2	-36.3	-44.6	- 2	- 9	10.7	A0	2	-37.8	+ 3.6	- 8	- 8	10.4	K5
3	-35.2	-56.5	- 1	+ 3	9.8	K5	3	+35.3	-29.3	+ 2	+ 9	11.4	...	3	-16.6	+45.6	- 1	+13	10.7	A5
4	+24.6	+79.3	- 4	-12	10.7	F0	4	+38.1	+33.9	- 2	- 9	10.2	F5	4	- 3.9	-43.0	-10	+22	10.5	G5
5	+49.2	-38.1	+ 1	- 3	11.0	K0							5	+ 4.7	+27.3	0	- 3	9.9	K0	
6	+64.7	+17.9	+ 3	+15	11.3	K:							6	+ 6.3	-15.5	+ 4	+ 9	10.2	K0	
													7	+21.5	+ 8.4	+ 8	- 2	11.9	...	
													8	+71.5	- 4.0	-13	- 4	9.9	K0	
W Dra 262 M 9.0-15.0						RV Sgr 318 M 7.2-14.8						RZ Her 329 M 9.0-15.5								
18 ^h 05.5 ^m +65° 57' 63° +28°						(Y) 18 ^h 21.4 ^m -33° 23' 328° -11'						18 ^h 32.7 ^m +25° 58' 23° +13'								
0 + 7						+ 1 - 8						+ 1 - 1								
V +10.1 -20.9 - 5 -18 10.2 M4e						V - 7.5 + 4.8 +11 0 9.8 M5e						V -11.0 + 6.3 - 6 -12 9.9 M5e								
1	-58.7	+49.7	-10	+10	10.6	F2	1	-53.0	-42.5	- 6	0	10.1	K:	1	-59.3	-17.9	-14	-12	10.4	K0
2	-48.2	+24.4	+ 2	0	10.5	F2	2	-52.4	+21.3	- 3	-12	11.3	K:	2	-35.0	+18.7	+ 4	- 6	10.1	G5
3	-38.9	-16.8	+ 9	- 5	10.4	F0	3	-43.6	+45.7	+ 6	+ 1	10.1	A0	3	-15.1	-38.7	+ 4	+29	10.7	K0
4	- 8.1	-16.3	- 1	- 5	10.7	...	4	-27.7	-36.6	+ 2	+11	11.0	A0	4	- 6.3	+30.2	+ 6	-10	10.7	F0
5	+ 8.2	-35.2	-20	- 2	10.2	K0	5	+24.7	-10.1	+ 4	+ 7	11.9	...	5	+ 7.7	+37.1	-19	+19	10.6	G:
6	+33.2	-43.6	+13	+12	10.7	F2	6	+30.5	+14.6	- 5	+ 6	11.4	A0	6	+21.6	-11.1	+ 1	- 3	10.0	K0
7	+34.5	+14.4	+ 3	+14	10.9	K2	7	+60.5	-35.3	- 1	-18	11.2	...	7	+42.5	+16.8	+ 9	- 2	11.4	...
8	+78.0	+23.3	+ 4	-24	10.9	...	8	+61.0	+42.9	+ 2	+ 5	11.0	K:	8	+43.9	-35.1	+ 9	- 8	11.6	...
TV Her 303 M 9.0-14.6						SV Her 239 M 9.1-15.0						X Oph 334 M 5.9- 9.2								
18 ^h 11.0 ^m +31° 47' 26° +20°						18 ^h 22.3 ^m +24° 56' 21° +15°						18 ^h 33.6 ^m +08° 45' 7° + 5°								
+ 1 0						+ 1 - 1						+ 1 - 4								
V +10.0 - 9.7 -11 - 8 9.8 M4e						V + 7.6 - 0.1 0 - 6 10.5 M5e						V -12.9 - 4.9 + 6 +23 9.1 M7e								
1	-49.2	+35.9	-14	-13	11.4	...	1	-58.7	-40.1	+14	- 6	10.6	G0	1	-60.9	+33.8	+ 4	+ 5	10.4	M2
2	-41.2	- 3.1	- 6	+ 2	10.6	...	2	-58.0	+29.9	- 4	- 8	10.6	F8	2	-44.3	-34.7	- 4	- 3	10.0	K2
3	-33.5	-38.0	- 4	+ 1	10.4	F5	3	-27.0	-36.3	-11	+17	9.4	K0	3	-11.0	-23.9	9	+ 4	10.2	A5
4	- 3.1	+ 7.1	+24	+10	10.5	F8	4	- 1.6	+40.5	+ 2	- 3	10.6	G0	4	+36.9	-15.1	+ 4	-12	9.7	K0
5	+11.1	+13.2	- 7	-13	10.8	A	5	+25.5	+49.7	- 5	- 7	10.0	K:	5	-38.2	+19.7	- 3	+ 9	10.4	A0
6	+30.6	-18.9	+ 5	- 8	11.0	A5:	6	+27.3	-28.4	+ 9	- 4	10.5	G0	6	+41.1	+20.2	- 1	- 1	10.0	A0
7	+37.9	+49.6	- 3	+16	10.8	...	7	+37.1	-36.2	-11	- 7	11.1	...							
8	+47.2	-45.8	+ 6	+ 5	9.4	F8	8	+55.4	+20.9	+ 7	+18	10.2	A5							

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
RS Dra 280 SRa 9.0-12.0							RT Lyr 251 M 9.1-15.2							RW Sgr 190 M 9.0-11.5						
	$18^{\text{h}}40.2^{\text{m}}$	$+74^{\circ}14'$			72	$+27^{\circ}$		$18^{\text{h}}57.8^{\text{m}}$	$+37^{\circ}23'$			36	$+13^{\circ}$		$19^{\text{h}}08.1^{\text{m}}$	$-19^{\circ}02'$			346	-15°
		$+2 +9$						$+2 +1$							$+2 -8$					
V	$+8.2$	-18.1	-3	-10	9.8	M5e	V	$+3.1$	-2.5	$+12$	$+11$	10.8	M5e	V	-23.6	-9.3	-8	$+6$	10.2	M4
1	-47.0	-37.6	$+2$	$+35$	10.5	K0	1	-80.0	-1.0	-2	-2	9.9	...	1	-44.2	-8.1	$+1$	-7	8.8	A0
2	-43.0	$+40.5$	-12	$+6$	8.8	K2	2	-59.3	-25.3	-7	$+1$	10.0	F0	2	-30.5	$+22.4$	$+3$	$+1$	10.5	K:
3	-15.5	$+8.4$	$+11$	-42	10.5	F8	3	-33.3	$+28.6$	$+1$	-27	11.5	...	3	-21.5	-22.1	-4	$+6$	10.6	A0
4	-10.8	-18.6	-1	$+1$	9.3	K0	4	-2.1	$+8.8$	$+7$	$+28$	10.5	...	4	$+10.6$	-29.3	$+3$	$+1$	8.5	K0
5	$(+4.4 -55.6)$	$(+56 +142)$			10.3	K2	5	$+28.7$	-6.9	$+6$	$+12$	11.0	...	5	$+32.1$	$+15.5$	$+28$	-4	10.7	G0
6	$+19.6$	$+33.1$	$+1$	$+36$	8.3	A2	6	$+38.5$	-41.7	$+3$	-12	10.3	...	6	$+53.5$	$+21.6$	-31	$+3$	9.9	K0
7	$+43.1$	-17.3	$+2$	-27	9.3	F0	7	$+48.4$	$+19.1$	-3	$+1$	10.2	...							
8	$+53.6$	-8.5	-3	-8	11.0	K2	8	$+59.0$	$+16.4$	-6	-2	9.8	...							
RY Lyr 326 M 9.0-15.6							R Aql 300 M 5.7-12.0							RW Sgr 190 M 9.0-11.5						
	$18^{\text{h}}41.3^{\text{m}}$	$+34^{\circ}34'$			31	$+15^{\circ}$		$19^{\text{h}}01.6^{\text{m}}$	$+08^{\circ}05'$			10	-1°		$(Y) 19^{\text{h}}08.1^{\text{m}}$	$-19^{\circ}02'$			346	-15°
		$+2 +1$						$+2 -4$							$+3 -9$					
V	$+13.5$	$+15.0$	0	-3	10.0	M6e	V	$+2.8$	$+9.1$	-2	-53	10.6	M8e	V	$+3.4$	$+1.5$	-19	+5	11.7	M4
1	-51.4	-38.2	$+2$	$+11$	10.7	...	1	-43.8	-49.2	-6	0	10.1	G5	1	-64.4	$+62.1$	-5	+1	11.1	K:
2	-45.9	$+37.4$	$+1$	$+5$	9.9	F0	2	-36.6	$+49.8$	-7	$+13$	10.9	A0	2	-63.0	-52.9	$+14$	$+5$	11.0	fg
3	-25.0	-7.5	-10	-19	10.3	...	3	-34.3	$+55.4$	$+11$	-13	10.2	G5	3	-39.0	-36.4	$+2$	$+1$	10.7	K2
4	-19.0	$+3.8$	$+6$	$+3$	10.9	...	4	-3.0	-24.7	$+2$	0	9.5	K0	4	-37.5	$+25.9$	-11	-7	12.8	...
5	$+33.0$	$+48.5$	-7	16	11.2	...	5	$+19.2$	-23.8	-9	-8	11.1	A0	5	$+14.2$	-27.3	-7	$+16$	10.9	K0
6	$+31.5$	-40.2	$+2$	1	9.9	K0	6	$+20.0$	-27.0	-3	-1	10.6	A:	6	$+61.5$	$+55.4$	-10	$+5$	10.9	G:
7	$+35.6$	-16.6	$+5$	$+8$	10.7	...	7	$+38.9$	$+29.2$	-4	0	8.3	A0	7	$+63.2$	-53.0	-10	-22	11.2	G0
8	$+42.2$	$+12.8$	0	$+8$	10.4	G:	8	$+40.5$	-9.7	$+16$	$+9$	8.8	K0	8	$+64.9$	$+28.2$	$+26$	-9	10.7	G0
ST Sgr 395 M 7.6-15.2							V Lyr 374 M 8.8-15.0							RX Sgr 334 M 9.3-14.1						
	$(Y) 18^{\text{h}}55.9^{\text{m}}$	$-12^{\circ}54'$			250	-9°		$19^{\text{h}}05.2^{\text{m}}$	$+29^{\circ}30'$			29	$+8^{\circ}$		$19^{\text{h}}08.7^{\text{m}}$	$-18^{\circ}59'$			346	-15°
		$+2 -8$						$+2 -1$							$+2 -8$					
V	$+0.5$	-2.5	-3	+2	9.9	Se	V	$+11.4$	-1.5	-5	0	11.3	M7e	V	$+2.5$	-0.8	-15	+24	10.5	M5e
1	-60.7	-62.6	-14	-13	9.6	G5	1	-51.1	$+10.4$	-10	-15	11.5	...	1	-44.2	-8.1	$+1$	-7	8.8	AG
2	-48.7	$+35.3$	-5	$+16$	11.5	A0	2	-42.2	-22.8	$+5$	-3	11.1	...	2	-30.5	$+22.4$	$+3$	$+1$	10.5	K:
3	-16.4	-46.3	$+10$	$+8$	9.4	G5	3	-16.6	$+41.8$	$+7$	$+10$	11.5	...	3	-21.5	-22.1	-4	$+6$	10.6	A0
4	-6.7	$+65.7$	$+8$	-12	10.9	G:	4	-12.6	-41.8	-2	$+8$	10.9	...	4	$+10.6$	-29.3	$+3$	$+1$	8.5	K0
5	$+8.5$	$+65.0$	-5	-1	11.2	A	5	$+11.6$	$+38.9$	$+8$	$+12$	11.0	K5	5	$+32.1$	$+15.5$	$+28$	-4	10.7	G0
6	$+32.8$	-26.5	$+4$	$+7$	9.9	B6	6	$+21.8$	-36.0	-2	-8	11.1	...	6	$+53.5$	$+21.6$	-31	$+3$	9.9	K0
7	$+41.4$	-51.6	0	-2	10.1	B8	7	$+39.4$	$+27.0$	-5	-7	11.6	...							
8	$+49.8$	$+22.9$	$+2$	-5	11.0	A	8	$+49.7$	-17.6	0	$+4$	10.7	A0							
Z Lyr 288 M 9.2-15.0							TY Lyr 332 M 10.3-13.5							RX Sgr 334 M 9.3-14.1						
	$18^{\text{h}}56.0^{\text{m}}$	$+34^{\circ}49'$			33	$+12^{\circ}$		$19^{\text{h}}05.8^{\text{m}}$	$+27^{\circ}55'$			28	$+8^{\circ}$		$(Y) 19^{\text{h}}08.7^{\text{m}}$	$-18^{\circ}59'$			346	-15°
		$+2 +1$						$+2 -1$							$+3 -9$					
V	-1.4	$+1.6$	$+3$	-6	10.5	M5e	V	$+5.2$	-5.2	$+2$	$+4$	10.2	M8e	V	$+32.2$	$+10.6$	-5	$+15$	11.7	M5e
1	-33.3	$+12.4$	$+5$	$+10$	10.7	...	1	-72.0	$+42.7$	-3	-3	10.1	A2	1	-64.4	$+62.1$	-5	$+1$	11.7	K:
2	-31.4	-29.7	-6	-1	10.7	F0	2	-62.9	-31.5	0	-2	9.8	A0	2	-63.0	-52.9	$+14$	$+5$	11.0	fg
3	-22.0	$+38.1$	$+4$	$+1$	10.9	K:	3	-44.9	-33.3	0	-2	10.8	A2	3	-39.0	-38.4	$+2$	$+1$	10.7	K2
4	-15.8	-24.3	-2	-10	10.5	...	4	-12.7	$+27.0$	$+4$	$+7$	10.5	A5	4	-37.5	$+25.9$	-11	-7	12.8	...
5	$+18.6$	-26.4	-5	$+3$	10.9	...	5	$+27.2$	$+40.0$	$+4$	-4	9.9	A5	5	$+14.2$	-27.3	-7	$+16$	10.9	K0
6	$+21.0$	$+13.6$	-27	-19	9.6	K0	6	$+50.0$	$+0.5$	-4	0	10.0	F8	6	$+61.5$	$+55.4$	-10	$+15$	10.5	G:
7	$+23.7$	-11.8	$+13$	$+8$	9.7	K0	7	$+54.4$	-26.2	-2	$+6$	10.3	A0	7	$+63.2$	-53.0	-10	-22	11.2	G0
8	$+39.2$	$+28.1$	$+15$	$+9$	10.8	G5	8	$+60.8$	-19.3	$+2$	-2	10.6	A0	8	$+64.9$	$+28.2$	$+26$	-9	10.7	G0

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
S Lyr	438	M			10.4-15.5		T Sgr	392	M			7.7-12.9		Z Sgr	451	M			8.4-16.0	
	19 ^h 09.1 ^m		+25° 50'		26° + 6'			19 ^h 10.5 ^m		-17° 09'		348° -14°			19 ^h 13.8 ^m		-21° 07'		345° -17°	
			+ 2 - 1							+ 3 - 8						+ 2 - 7				
V	+ 3.6	- 8.0	+ 3	- 7	11.0	S	V	- 2.8	-15.6	- 1	- 5	10.4	S6e	V	+11.8	- 0.7	- 2	+20	11.0	M4e M5e
1	-62.2	+13.0	-59	-12	11.0	...	1	-56.6	-36.0	+ 6	+ 3	8.8	A0	1	-60.8	-38.7	+ 9	-11	10.2	A2
2	-59.7	- 3.1	+31	+ 7	11.6	...	2	-36.0	-21.2	- 1	-17	10.1	K:	2	-49.6	+42.1	0	+16	11.3	...
3	-28.2	+39.3	+35	+15	11.0	...	3	-33.4	+32.1	- 8	+16	11.2	...	3	-44.2	-46.0	- 4	-28	10.8	K
4	-18.3	-52.6	- 7	-11	10.9	A0	4	-14.5	+45.0	+ 3	- 2	8.4	K2	4	-20.4	+45.9	- 5	+23	11.0	A2
5	+25.8	-48.4	- 9	+ 4	11.6	A0	5	+32.1	+46.3	+ 5	-14	10.4	...	5	+30.3	+14.0	- 5	+23	11.6	...
6	+34.5	+15.2	+11	-10	10.8	...	6	+32.3	-42.3	-10	+ 6	9.6	K0	6	+31.6	-35.7	+ 2	+17	11.6	F8:
7	+49.7	+39.0	+12	+ 6	10.4	K5	7	+32.6	-20.8	+ 4	0	10.3	...	7	+50.4	+25.1	+10	-61	9.7	K0
8	+58.3	- 2.5	-14	0	10.7	A:	8	+43.5	- 3.1	+ 1	+ 8	10.4	K:	8	+62.7	- 6.7	- 7	+22	10.7	K5
RS Lyr	305	M			9.2-15.6		R Sgr	269	M			6.7-12.8		U Lyr	457	M			8.3-13.5	
	19 ^h 09.3 ^m		+33° 15'		33° + 9°			19 ^h 10.8 ^m		-19° 29'		346° -16°			19 ^h 16.7 ^m		+37° 41'		37° -10°	
			+ 2 0							+ 3 - 9						+ 2 - 1				
V	+ 4.2	+ 2.2	- 3	- 2	11.3	M5e	V	+10.9	+ 1.2	+ 9	- 2	10.5	M5e	V	-14.7	+ 4.8	- 1	+ 3	10.4	N0e C4g?
1	-62.3	+36.8	- 4	+ 3	10.2	A5	1	-41.0	+21.1	0	-19	10.6	g5	1	-57.5	+36.5	0	- 6	11.5	F2
2	-53.8	-25.8	+ 5	+ 3	9.8	A0	2	-37.8	-20.6	0	+ 9	9.7	F5	2	-53.9	-39.1	-10	-12	11.3	K5
3	-31.1	-26.1	0	+ 3	10.9	A:	3	-37.4	- 8.4	0	+10	10.5	g5	3	-16.0	+41.8	- 1	- 3	10.7	K0
4	-18.3	+26.2	- 1	-10	10.1	K2	4	+22.0	+43.8	+ 6	+13	9.6	K0	4	-14.8	-12.3	+11	+22	10.4	F0
5	+13.3	-26.4	- 1	- 4	11.0	...	5	+39.9	+19.1	- 6	+ 6	8.7	K2	5	-24.6	-52.1	+13	- 2	11.2	A5
6	+44.9	-22.6	- 3	- 3	11.2	...	6	+54.3	-54.9	0	-19	8.9	K0	6	+28.5	+25.8	0	- 9	11.0	A2
7	+49.0	+14.5	+ 3	- 3	10.2	K0							7	-37.9	-33.9	-14	- 8	10.6	K0	
8	+58.3	+23.4	+ 1	+10	10.3	K0							8	-51.2	-33.4	+ 1	+18	11.7	...	
U Dra	317	M			9.1-14.6		R Sgr	269	M			6.7-12.8		RT Aql	327	M			7.8-14.5	
	19 ^h 09.9 ^m		-67° 07'		65° +22°		(Y)	19 ^h 10.8 ^m		-19° 29'		346° -16°			19 ^h 33.3 ^m		+11° 30'		16° - 6°	
			+ 4 - 9							+ 2 - 9						+ 4 - 4				
V	+ 8.7	+ 4.0	-12	-14	10.5	M6e M8e	V	+11.9	+ 1.4	+ 7	- 1	10.2	M6e	V	- 6.2	+15.0	-12	- 1	9.7	M6e M8e
1	-50.0	+ 3.3	+15	+50	10.6	K0	1	-45.2	+23.2	- 1	-16	10.6	g5	1	-50.2	+27.0	-11	-16	10.4	K2
2	-48.0	+19.3	-10	-23	10.9	F5	2	-41.6	-22.6	- 1	+ 6	9.7	F5	2	-48.5	-30.7	+12	+ 8	10.3	A0
3	-24.8	+27.6	- 5	-31	9.6	F5	3	-41.2	- 9.3	+ 3	+10	10.5	g5	3	-35.5	-31.3	-18	- 9	9.0	A5
4	-25.8	-52.8	0	+ 4	10.0	F8	4	+24.2	+48.3	+11	+11	9.6	K0	4	-23.7	-24.2	+17	+17	10.1	K2
5	+23.7	+46.5	+ 4	+13	9.7	K0	5	+44.0	+21.0	-10	+ 6	8.7	K2	5	+19.9	-25.4	-50	-79	9.5	G5
6	+26.0	-15.9	- 2	-15	10.3	G5	6	+59.8	-60.4	- 1	-16	8.9	K0	6	+34.4	-41.4	+21	+54	9.6	F5
7	+45.2	-44.9	+ 2	+11	10.0	K0							7	+51.6	+38.6	+16	+12	9.9	A2	
8	+53.7	+16.9	- 3	- 8	12.0	...							8	-52.0	+24.8	+13	+13	10.6	A0	
W Aql	490	M			7.9-14.2		S Sgr	231	M			9.5-16.0		R Cyg	426	M			6.5-14.2	
	19 ^h 10.0 ^m		-07° 13'		357° -10°			19 ^h 13.6 ^m		-19° 12'		346° -16°			19 ^h 34.1 ^m		+49° 59'		50° +13°	
			+ 2 - 5							+ 3 -11						+ 4 + 3				
V	- 8.8	- 8.5	+17	+ 5	10.2	S4.9.e	V	+11.0	- 3.3	0	-15	11.1	M4e	V	+ 4.2	- 8.1	- 3	+ 6	10.5	S3.9e S5.8e
1	-46.7	+52.4	+ 1	+ 6	2.8	K:	1	-54.2	+ 1.3	+18	-35	11.2	...	1	-59.3	+17.2	+ 5	+12	11.5	G:
2	-41.6	-34.4	- 4	- 4	9.9	A0	2	-49.0	-23.8	- 3	-29	10.4	K2	2	-57.2	-46.2	- 6	-16	9.7	K0
3	-14.4	-28.1	+ 3	- 2	10.6	A:	3	-32.3	- 9.9	-20	+50	10.2	K	3	-28.9	-35.0	+ 2	- 4	10.3	A0
4	-16.6	-25.5	+ 1	+ 6	10.9	K:	4	-29.4	+29.0	+ 5	+13	10.6	F8	4	-14.1	+30.8	- 2	+ 8	11.0	...
5	+31.8	+16.8	- 4	+12	9.8	A0	5	+31.0	- 5.9	+16	+16	11.1	G:	5	+14.9	+29.3	- 5	-12	10.3	K0
6	+54.3	+18.8	+ 3	-18	10.8	K0	6	+41.5	+20.4	- 1	+18	10.8	K0	6	+42.6	-27.6	- 3	+ 5	9.6	K0
							7	+45.4	+38.3	-22	+ 4	10.0	G0	7	+47.4	+39.0	+ 2	- 7	10.0	K0
							8	+47.0	-48.3	+ 8	-37	10.5	K5	8	+54.6	- 7.5	+ 7	+14	9.1	K0

No.	X	Y	μ_{α}	μ_{δ}	m	Sp
BG Cyg		292	M		9.1-12.4	
	$19^{\text{h}} 34.9^{\text{m}}$	$+28^{\circ} 17'$			$31^{\circ} + 2^{\circ}$	
		$+ 3 - 1$				
V	$+ 3.5 - 1.7$	$+ 4 - 1$			10.2	M7e
1	-47.0	+27.5	0	+ 5	10.7	F0
2	-29.5	-22.5	0	- 5	10.8	K
3	+35.1	-31.9	0	+ 5	9.9	K
4	+41.4	+26.9	0	- 5	10.5	...

RV Aql		219	M		8.1-14.8	
	$19^{\text{h}} 36.0^{\text{m}}$	$+09^{\circ} 42'$			$15^{\circ} - 8^{\circ}$	
		$+ 4 - 4$				
V	$- 3.1 - 11.7$	$0 - 1$			10.4	M3e
1	-52.4	+45.6	- 7	+ 4	10.3	K5
2	-34.3	-35.4	- 4	0	10.4	A0
3	- 7.9	+41.1	+22	+ 5	10.1	G5:
4	- 6.6	-44.6	-11	- 9	10.1	A0
5	+13.9	-20.1	+ 7	+12	11.3	F2
6	+17.1	+ 7.5	-14	- 1	9.0	K0
7	+26.4	+33.9	- 1	- 7	8.9	A0:
8	+44.0	-28.0	+ 8	- 4	9.7	K0

RT Cyg		190	M		6.4-12.7	
	$19^{\text{h}} 40.8^{\text{m}}$	$+48^{\circ} 32'$			$49^{\circ} +11^{\circ}$	
		$+ 5 + 3$				
V	$- 5.6 + 2.5$	$- 5 +20$			10.2	M2e M4e
1	-66.9	+ 8.2	- 4	-11	10.6	A5
2	-33.4	-39.9	0	+ 9	9.3	F8
3	-10.6	+30.6	+ 2	+ 2	9.9	K0
4	- 7.1	+11.7	+ 2	0	9.3	A2
5	+ 0.9	+ 6.7	+ 5	- 2	10.3	A0
6	+33.9	-12.6	+ 6	-27	10.8	G0
7	+39.5	-14.1	- 6	+19	10.9	G0
8	+43.7	+ 9.4	- 5	+11	9.5	K0

TU Cyg		219	M		8.7-14.9	
	$19^{\text{h}} 43.4^{\text{m}}$	$+48^{\circ} 50'$			$50^{\circ} +11^{\circ}$	
		$+ 3 + 2$				
V	$+10.0 + 2.7$	$- 7 - 6$			10.8	M3e M4e
1	-56.9	-42.9	+ 3	- 6	10.6	K:
2	-47.8	-11.8	- 5	- 3	11.5	...
3	-22.7	+21.8	+ 1	+10	9.9	A0:
4	-18.6	+34.8	+ 1	- 1	11.4	...
5	+ 6.5	+13.2	- 8	- 3	10.4	A0
6	+ 8.6	-14.3	- 2	+ 2	10.0	K0
7	+64.8	+33.6	+ 6	- 6	10.8	...
8	+75.9	-34.3	+ 4	+ 7	10.0	K0:

No.	X	Y	μ_{α}	μ_{δ}	m	Sp
X Aql		348	M		8.3-15.2	
	$19^{\text{h}} 46.5^{\text{m}}$	$+04^{\circ} 13'$			$12^{\circ} -13^{\circ}$	
		$+ 5 - 6$				
V	$+ 1.1 - 3.7$	$- 4 - 3$			10.7	M6e
1	-61.7	+10.1	- 3	0	10.1	G0
2	-26.2	-33.9	+ 3	0	10.3	K
3	-18.2	+35.2	- 1	0	10.4	K5
4	+30.2	+42.7	+ 3	0	10.7	K
5	+31.8	-42.9	- 8	- 4	10.4	K
6	+44.1	-11.2	+ 5	+ 3	10.1	K0

X Cyg		407	M		3.3-14.2	
	$19^{\text{h}} 46.7^{\text{m}}$	$+42^{\circ} 40'$			$36^{\circ} + 2^{\circ}$	
		$+ 3 0$				
V	$-11.6 -17.0$	$-24 -35$			10.6	M6 M10 S7.1e: S10.1e:
1	-59.5	-15.3	+ 1	- 4	10.0	A5
2	-49.1	+22.7	- 8	- 7	10.1	A2
3	-26.8	+21.6	+ 5	+ 5	9.3	A0
4	- 3.6	-45.2	+ 1	+ 6	11.3	A2
5	+ 6.3	+36.2	+ 4	+ 7	10.7	A2
6	+22.4	-23.8	- 6	- 7	10.7	G:
7	+48.3	+45.4	- 1	- 5	11.3	A2
8	+61.0	-41.6	+ 4	+ 6	10.5	A5

RR Sgr		334	M		5.6-14.0	
	$19^{\text{h}} 49.7^{\text{m}}$	$-29^{\circ} 27'$			$339^{\circ} -27^{\circ}$	
		$+ 5 -11$				
V	$+ 4.3 -13.3$	$-20 0$			11.1	M5e
1	-53.7	-17.6	+10	+ 4	11.3	...
2	-29.8	-49.4	-10	+ 1	9.5	K0:
3	-21.5	+23.8	- 1	+ 8	10.0	K:
4	-16.3	+ 6.4	+ 1	-13	10.9	G:
5	+11.8	-32.0	- 6	+ 7	11.1	...
6	+16.1	+42.8	-11	- 2	11.3	...
7	+40.2	+39.1	- 1	+ 7	11.4	...
8	+53.2	-13.1	+18	-13	10.7	G:

RR Aql		394	M		7.6-14.5	
	$19^{\text{h}} 52.4^{\text{m}}$	$-02^{\circ} 09'$			$7^{\circ} -17^{\circ}$	
		$+ 5 - 7$				
V	$- 8.7 - 3.4$	$-21 -38$			9.9	M6e M7e
1	-55.6	+54.3	+ 8	- 4	9.8	K0
2	-35.8	-47.7	+ 2	- 1	10.3	G:
3	-22.8	-22.3	- 6	+ 2	8.7	A5
4	- 4.9	+31.5	- 4	- 4	10.3	...
5	- 1.9	-26.7	0	+ 7	9.3	K5
6	+28.1	+12.6	- 2	+ 7	10.4	...
7	+33.3	+17.1	- 3	+ 1	10.5	...
8	+59.6	-18.8	+ 5	- 8	10.2	K0

No.	X	Y	μ_{α}	μ_{δ}	m	Sp
RS Aql		410	M		8.7-15.4	
	$19^{\text{h}} 53.7^{\text{m}}$	$-08^{\circ} 09'$			$1^{\circ} -20^{\circ}$	
		$+ 4 - 7$				
V	$+ 9.9 - 5.3$	$+ 2 + 3$			10.9	M7e
1	-62.0	-12.8	- 5	- 6	10.9	...
2	-32.1	+46.4	-10	-22	11.5	...
3	-10.9	+28.5	+ 9	+ 3	11.1	...
4	- 6.8	-45.4	+10	+25	11.7	...
5	+12.7	+45.3	- 5	- 4	10.3	A:
6	+13.2	-34.3	-11	+ 8	11.3	...
7	+36.9	-30.4	-13	-27	11.0	G:
8	+49.0	+ 5.7	+ 7	+23	11.3	A:

Z Cyg		264	M		7.6-14.7	
	$19^{\text{h}} 58.6^{\text{m}}$	$+49^{\circ} 10'$			$52^{\circ} +10^{\circ}$	
		$+ 5 + 3$				
V	$+11.6 +15.5$	$+16 - 5$			10.2	M5e
1	-58.1	+49.8	-11	- 6	11.2	K:
2	-48.0	-46.8	+ 4	+ 4	10.5	K0
3	-44.8	+25.5	+ 4	+ 5	10.5	...
4	-31.5	-16.7	+ 3	- 3	9.8	G5
5	+11.0	-12.6	+ 7	- 3	10.2	K0
6	+53.0	+10.0	+ 7	+ 1	10.0	K0
7	+53.6	+30.3	+ 1	0	11.6	A2
8	+64.8	-39.5	-15	+ 1	10.3	...

SY Aql		356	M		8.3-15.4	
	$20^{\text{h}} 02.4^{\text{m}}$	$+12^{\circ} 40'$			$21^{\circ} -12^{\circ}$	
		$+ 6 - 5$				
V	$-11.0 +23.4$	$-31 - 4$			10.8	M5e
1	-51.9	-23.0	-21	+ 8	9.8	K0
2	-44.8	+26.3	-46	+ 9	9.7	K0
3	-38.4	+44.3	+65	-15	9.8	K0
4	-20.5	-30.2	+ 3	- 2	10.6	F5
5	+22.5	-17.3	+11	+ 2	10.6	G:
6	+23.6	+ 5.5	-15	- 1	10.3	K0
7	+53.8	-32.4	+ 8	- 9	9.9	G5
8	+55.7	+26.8	- 4	+ 8	11.2	...

S Cyg		323	M		9.3-16.0	
	$20^{\text{h}} 03.4^{\text{m}}$	$+57^{\circ} 42'$			$59^{\circ} +13^{\circ}$	
		$+ 4 + 3$				
V	$+ 4.4 + 6.7$	$+ 1 0$			10.8	S5.2e
1	-57.8	-24.7	0	- 5	11.4	A:
2	-42.4	+39.1	- 6	- 6	9.9	A0
3	-32.1	- 4.8	+ 7	+ 1	9.8	K0
4	-16.1	+15.7	- 1	+10	10.8	K0
5	+18.5	+24.3	+ 9	+ 3	10.0	K0
6	+41.2	-28.0	+ 3	+ 6	11.6	A0
7	+42.4	-51.2	-10	- 2	10.2	F0
8	+46.3	+29.5	- 2	- 6	9.7	K2

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
R Cap 345 M 9.4-14.7							R Del 285 M 7.6-13.7							WX Cyg 411 M 8.8-13.2						
	$20^h 05.7^m$		-14"	34'	35.7	-25"		$20^h 10.1^m$		+06"	47'	19"	-15"		$20^h 14.8^m$		+37"	08'	43"	0
			+ 5	- 8						+ 5	- 4						+ 4	0		
V	- 1.7	+ 4.4	+ 5	+ 5	10.3	Ne	V	+ 0.1	+10.0	-11	- 4	10.3	M5e	V	+ 5.7	- 1.2	0	- 8	11.4	C8e
1	-68.3	+49.3	- 8	-18	11.3	K2	1	-50.1	+46.4	+10	+ 6	11.3	g	1	-50.3	-11.5	- 2	- 1	11.2	...
2	-32.5	- 4.8	+ 4	- 7	11.4	K5:	2	-35.6	-34.2	+ 8	+ 1	10.8	G0	2	-44.8	+32.8	- 9	- 4	11.2	...
3	-30.8	+14.0	+ 6	+ 8	11.4	K5:	3	-24.2	+10.6	+ 6	+ 1	10.3	K2	3	-30.4	-31.5	- 1	- 3	11.5	...
4	-13.7	-46.4	- 2	+16	11.7	...	4	-22.9	-15.7	-24	- 8	10.9	G0	4	- 6.4	+27.8	+12	+ 8	11.5	K0
5	+ 8.7	-19.5	+ 6	-21	11.3	K0	5	+18.9	+31.3	- 7	- 8	11.5	G5	5	+ 4.2	+23.1	- 3	- 8	11.1	B2
6	+38.6	+ 6.1	- 7	- 1	11.9	...	6	+33.7	-19.8	-12	- 2	10.6	K:	6	+25.2	-24.0	- 2	+ 4	11.6	A2
7	+43.6	+25.8	+ 9	+10	10.6	F0	7	+34.4	-45.9	+29	+ 9	10.7	K2	7	+46.8	+22.6	+ 1	+ 3	10.8	G5:
8	+54.4	-24.5	- 7	+12	10.8	K0	8	+45.8	+27.3	-10	+ 1	11.8	G0:	8	+55.6	-39.3	+ 5	0	11.1	A0
S Aql 146 SRa 8.9-12.4							R Del 285 M 7.6-13.7							U Cyg 465 M 6.7-11.4						
	$20^h 07.0^m$		+15"	19'	24"	-11"	(?)	$20^h 10.1^m$		+06"	47'	19"	-15"		$20^h 16.5^m$		+47"	35'	52"	+ 6"
			+ 6	- 4						+ 5	- 4						+ 5	+ 1		
V	+ 6.9	+ 2.2	0	+21	9.4	M3e	V	+28.6	+11.2	- 4	- 6	10.9	M5e	V	- 2.1	+ 1.1	+ 7	+ 7	9.6	C7e
1	-36.8	+15.8	- 3	-12	10.3	..	1	-72.6	+36.2	+ 4	+ 3	11.8	G:	1	-64.7	+ 1.0	+17	+18	10.3	A2
2	-36.0	-24.3	- 2	-10	10.2	G5	2	-71.2	-52.2	+23	-26	11.5	G:	2	- 9.1	+27.7	-17	-18	10.6	K:
3	- 1.9	+10.5	+ 5	+22	10.6	...	3	-43.7	+35.9	- 8	+ 7	10.4	K0	3	+ 6.4	-49.9	+ 9	+10	10.0	F2
4	+ 7.5	- 2.1	+ 8	+23	9.4	G5	4	-40.0	-26.7	- 8	+ 8	11.8	G0	4	+ 8.6	+ 0.1	- 4	- 3	10.0	K0
5	+27.6	-25.9	- 6	-12	10.5	G0:	5	-26.7	+51.9	+ 1	+ 2	11.3	g	5	+ 9.2	+27.5	+ 1	+ 3	10.5	A2
6	+39.6	+27.0	- 2	-10	10.5	...	6	-10.9	-36.9	-11	+ 6	10.8	G0	6	+49.6	- 6.5	- 9	-10	10.4	F5
RU Aql 274 M 8.7-14.8							7	+ 1.8	+12.4	- 3	+ 6	10.3	K2							
	$20^h 08.1^m$		+12"	42'	22"	-13"	8	+ 3.2	-16.5	-30	- 6	10.9	G0							
			+ 5	- 3			9	+49.2	+35.2	- 4	- 9	11.5	G5							
V	- 3.2	+ 8.0	+ 3	+ 9	10.0	M5e	10	+65.5	-21.2	- 2	- 3	10.6	K:							
1	-57.6	+34.3	0	+ 3	10.0	...	11	+66.4	-49.9	+27	+14	10.7	K2							
2	-34.4	- 6.2	0	- 1	10.3	K:	12	+78.9	+30.8	+11	- 7	11.8	G0							
3	-29.8	+21.2	+ 2	- 3	10.0	K:	SX Cyg 412 M 8.2-15.2							U Mic 334 M 7.0-14.4						
4	-19.2	-28.3	- 2	+ 2	10.5	...		$20^h 11.6^m$		+30"	46'	38"	- 3"	(Y)	$20^h 22.6^m$		-40"	45'	328"	-37"
5	+12.7	-32.5	+ 3	+ 1	10.6	G5				+ 4	- 1					+ 6	-10			
6	+21.8	+46.0	+ 6	+ 6	9.8	A0	V	+14.4	- 5.0	-11	-16	10.0	M7e	V	- 0.1	+ 1.7	- 1	- 6	9.8	M5e
7	+51.3	-44.9	- 1	- 1	9.6	B8	1	-47.9	+19.5	- 8	- 4	10.3	F0	1	-65.8	+19.9	0	- 1	10.6	gk
8	+55.3	+10.5	- 8	- 5	10.9	A:	2	-39.6	+22.4	+ 4	0	10.2	K2:	2	-34.9	-32.5	+ 1	- 5	11.6	...
Z Aql 129 M 8.2-14.8							3	-37.5	-36.3	+ 7	+ 2	10.1	A2	3	-34.1	+41.6	- 9	+ 1	10.7	...
	$20^h 09.9^m$		-06"	27'	5"	-23"	4	-30.0	-22.9	- 4	+ 2	9.8	A5	4	-11.1	-31.7	- 7	+ 5	11.5	f
			+ 7	- 9			5	+25.4	+43.2	+ 1	+ 1	9.9	K2	5	+ 9.8	+56.0	- 6	-16	10.6	k
V	-20.4	+10.0	+ 3	+10	10.4	M3e	6	+28.1	-16.9	- 2	+ 1	10.4	A0	6	+17.9	-44.1	- 5	+ 2	11.3	...
1	-59.9	-36.1	+ 8	+21	11.1	F8	7	+42.2	+15.4	+ 3	+ 3	11.2	A0	7	+53.1	-29.8	- 4	- 2	12.8	...
2	-37.9	+ 3.3	+11	+31	10.5	K2:	8	+59.3	-24.4	- 1	- 6	9.6	A2	8	+65.2	+20.6	+15	-16	11.4	...
3	-31.2	-19.7	- 8	-24	10.8	G0	SZ Cep 327 M 9.3-14.6							RU Cap 347 M 9.2-15.2						
4	-37.3	+43.9	-11	-28	10.0	F8		$20^h 13.0^m$		+76"	53'	77"	-22"		$20^h 26.7^m$		-22"	02'	351"	-33"
5	-21.7	-33.4	- 6	- 1	10.9	...				+ 5	+ 6					+ 7	-10			
6	38.4	+28.8	- 2	- 2	11.0	G5	V	+ 1.5	-15.1	+ 9	-23	13.1	Se	V	-13.8	+12.8	+ 2	- 5	9.8	Me
7	+37.9	-17.6	+ 5	+ 5	10.8	...	1	-47.0	+39.4	+ 4	+11	12.0	...	1	-49.8	+50.1	+19	- 3	11.9	...
8	+58.2	+30.9	+ 2	- 2	10.4	K0	2	-28.9	-30.0	- 3	- 1	11.5	G:	2	-37.3	+ 3.5	- 7	- 3	11.7	G:
							3	-21.3	+31.9	- 4	- 4	12.6	...	3	-33.2	-27.2	- 9	+ 2	10.8	K:
							4	-13.7	-25.7	+ 4	- 6	12.5	...	4	-17.3	-46.5	- 3	+ 4	10.0	F5
							5	+ 8.3	-37.6	- 1	-10	11.7	...	5	+ 7.3	- 1.8	+29	-15	10.2	F8
							6	+27.8	+28.3	+ 8	+14	12.0	...	6	+26.7	+16.5	- 9	- 5	10.7	K:
							7	+34.8	-28.7	0	+16	11.6	K:	7	+45.6	+42.9	- 3	+11	10.5	G0
							8	+40.1	+22.4	- 8	-20	12.0	...	8	+56.0	-37.5	-18	+ 9	11.6	G

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
Z Del 304 M 8.3-15.3							V Cyg 421 M 7.7-13.9							V Aqr 244 SRb 7.4-10.2						
	$20^h 28.1^m$		$+17^{\circ} 07'$		$29^{\circ} -14'$			$20^h 38.1^m$		$+47^{\circ} 47'$		$54^{\circ} + 3'$			$20^h 41.8^m$		$+02^{\circ} 04'$		$17^{\circ} -26'$	
			$+ 5 - 3$							$+ 7 + 2$							$+ 6 - 5$			
						SS.2.5e							Npe							
V	$+ 8.9 - 3.3$		$- 5 - 6$		10.4	S7.2e:	V	$- 4.7 - 9.7$		$- 4 - 6$		9.8	C74e	V	$+ 9.3 + 3.1$		$- 6 +13$		11.0	M6e
1	$-55.9 +15.1$		$+ 2 + 2$		10.5	K0	1	$-42.0 -15.4$		$- 4 + 6$		9.6	B0	1	$-31.6 -54.5$		$+ 8 - 2$		11.1	K
2	$-28.8 +36.2$		$- 1 0$		10.7	...	2	$-16.4 -35.3$		$+ 2 0$		10.0	...	2	$-29.3 - 8.2$		$+ 1 + 2$		10.7	K
3	$-26.2 -25.0$		$0 + 1$		9.8	K0	3	$-15.3 + 6.1$		$+ 3 + 5$		9.5	A:	3	$-27.8 +25.4$		$- 9 0$		11.7	...
4	$-13.9 -48.6$		$- 1 0$		10.4	A2	4	$-14.7 +46.9$		$0 -11$		9.8	A:	4	$+25.1 -35.9$		$- 9 0$		9.3	K0
5	$+21.8 -42.4$		$- 1 - 2$		9.2	A2	5	$+38.3 +45.9$		$- 2 + 6$		9.7	A0:	5	$+29.6 +36.2$		$+ 6 +11$		11.4	K
6	$+33.2 - 2.2$		$+ 2 - 4$		9.9	K5	6	$+50.2 -48.2$		$+ 2 - 6$		9.0	F8	6	$+34.0 +37.0$		$+ 2 -11$		10.7	...
7	$+34.6 +39.3$		$- 9 - 6$		9.9	K2														
8	$+35.2 +27.6$		$+ 9 + 8$		10.5	K0:														
ST Cyg 336 M 9.4-14.5							S Del 277 M 8.3-12.3							V Del 534 M 8.1-15.5						
	$20^h 29.9^m$		$+54^{\circ} 37'$		$59^{\circ} + 8'$			$20^h 38.5^m$		$+16^{\circ} 44'$		$29^{\circ} -16'$			$20^h 43.2^m$		$+18^{\circ} 58'$		$32^{\circ} -16'$	
			$+ 5 + 2$							$+ 6 - 3$							$+ 5 - 2$			
																				M4e
V	$+ 7.3 - 0.6$		$+ 1 - 6$		10.4	M6e	V	$+22.6 + 9.6$		$+11 +11$		10.4	M6e	V	$+ 8.1 - 5.8$		$+ 8 + 4$		10.7	M5e
1	$-58.0 +38.8$		$- 3 - 6$		10.0	K0:	1	$-39.8 +11.7$		$-10 + 1$		9.7	K0	1	$-64.4 +28.9$		$-12 - 1$		11.0	F5
2	$-37.7 -30.3$		$- 2 - 1$		10.6	K0	2	$-27.8 +21.2$		$+14 +11$		10.0	K0	2	$-57.9 - 7.4$		$+14 + 6$		11.1	A0
3	$-17.2 +31.0$		$+ 2 + 2$		9.7	A2	3	$-26.8 -24.4$		$- 7 - 8$		10.3	...	3	$-19.5 -19.4$		$- 6 - 4$		9.8	F2
4	$-16.8 -25.7$		$+ 3 + 5$		9.9	A5	4	$-17.3 -38.0$		$+ 3 - 4$		9.6	A0	4	$- 1.3 +36.4$		$+ 4 - 1$		10.7	K:
5	$+24.3 +30.4$		$- 2 + 1$		10.4	K2	5	$+12.9 +36.1$		$+ 8 + 7$		9.6	...	5	$+10.9 +11.6$		$+ 8 + 3$		11.5	...
6	$+31.7 -34.2$		$+ 5 - 1$		10.5	K2	6	$+21.6 -44.5$		$+ 4 +12$		9.9	K5	6	$+37.6 -42.1$		$+ 1 0$		11.2	K0:
7	$+34.6 -35.0$		$- 6 - 3$		10.6	K0	7	$+32.3 +30.4$		$- 8 -13$		9.9	F2:	7	$+46.8 -33.4$		$-10 - 2$		10.6	F0
8	$+39.1 +25.0$		$+ 3 + 3$		9.9	A0	8	$+44.9 + 7.5$		$- 4 - 5$		10.8	K0	8	$+47.6 +25.1$		$0 0$		11.1	K0:
RU Vul 156 SRa 8.8-12.2							T Del 332 M 8.5-15.2							T Aqr 202 M 7.2-14.2						
	$20^h 37.5^m$		$+22^{\circ} 54'$		$34^{\circ} -12'$			$20^h 40.7^m$		$+16^{\circ} 02'$		$30^{\circ} -17'$			$20^h 44.7^m$		$-05^{\circ} 31'$		$10^{\circ} -30'$	
			$+ 6 - 2$							$+ 6 - 3$							$+ 7 - 7$			
																				M2e
V	$+10.8 - 0.4$		$0 + 8$		10.2	M3e	V	$+ 1.5 - 2.3$		$- 5 +11$		9.9	M6e	V	$+ 8.9 - 2.7$		$-22 - 2$		10.6	M5e
1	$-61.2 +49.1$		$+ 9 - 1$		10.0	A0	1	$-45.9 -13.0$		$- 3 - 1$		9.6	A:	1	$-62.2 +11.0$		$+ 8 +13$		10.8	K0
2	$-49.6 -15.2$		$-26 + 5$		11.9	G:	2	$-14.7 - 1.8$		$+16 + 6$		9.8	K0	2	$-33.2 -27.8$		$- 7 - 1$		11.4	...
3	$-15.5 +14.9$		$- 4 - 4$		11.0	A0	3	$- 5.4 -24.6$		$-12 - 6$		10.8	...	3	$-25.8 +30.2$		$0 - 1$		11.4	...
4	$-15.7 -49.6$		$+21 0$		10.8	F8	4	$+ 9.5 - 1.8$		$+ 3 + 4$		10.9	G5	4	$-14.6 +48.1$		$- 1 -11$		10.0	K0
5	$+12.2 -45.3$		$+ 3 - 1$		10.2	G:	5	$-22.7 +36.3$		$- 8 - 4$		9.0	A0	5	$+12.3 -33.3$		$- 8 - 6$		11.5	A0
6	$+20.7 +43.4$		$- 8 + 4$		11.4	K:	6	$+33.8 + 4.9$		$+ 5 + 1$		10.0	F:	6	$31.0 -22.0$		$-20 -15$		9.8	K5
7	$+49.7 -14.7$		$+ 2 - 4$		11.6	A:								7	$+39.6 -17.9$		$+35 +22$		10.6	F8
8	$+59.4 +16.8$		$+ 3 + 1$		11.1	K:								8	$+52.8 + 6.7$		$- 7 - 1$		11.8	...
Y Del 470 M 8.8-14.7							W Aqr 381 M 8.7-14.9							RZ Cyg 276 SRa 9.8-14.1						
	$20^h 36.9^m$		$+11^{\circ} 31'$		$25^{\circ} -19'$			$20^h 41.2^m$		$-04^{\circ} 27'$		$11^{\circ} -29'$			$20^h 48.5^m$		$+46^{\circ} 59'$		$55^{\circ} + 1'$	
			$+ 6 - 4$							$+ 6 - 6$							$+ 5 + 1$			
V	$+ 0.3 - 2.9$		$- 8 + 6$		11.5	M8e	V	$+ 0.3 + 5.0$		$- 3 -12$		11.3	M7e	V	$-13.0 + 5.2$		$+ 4 - 6$		11.4	M7
1	$-44.5 -51.2$		$-19 +11$		11.4	...	1	$-41.5 - 7.1$		$+ 5 - 3$		10.5	G0	1	$-57.3 -24.4$		$+ 7 + 8$		11.6	A:
2	$-33.2 +47.4$		$+14 +15$		10.7	A:	2	$-28.1 +38.8$		$- 1 + 5$		10.9	F0	2	$-47.4 +18.1$		$- 3 + 1$		11.5	...
3	$-22.6 - 8.4$		$+16 -18$		10.1	G0	3	$-14.8 + 4.1$		$+ 4 - 3$		11.3	K0	3	$-27.4 -27.9$		$+ 2 + 1$		11.2	...
4	$- 8.6 + 9.0$		$-11 - 8$		10.0	K5:	4	$- 1.7 -24.6$		$- 8 + 1$		9.8	F0	4	$-20.0 +45.2$		$- 5 - 9$		11.3	...
5	$+ 2.7 + 5.5$		$- 5 - 2$		10.0	K5:	5	$+ 8.5 -16.2$		$- 4 + 8$		10.2	F2	5	$-21.3 + 8.4$		$- 1 + 8$		11.0	...
6	$+32.2 -12.4$		$+ 7 + 4$		10.9	K0:	6	$+12.6 -25.1$		$+ 7 - 6$		11.9	...	6	$+23.5 -19.3$		$- 6 - 5$		11.5	...
7	$+36.9 -32.8$		$- 4 + 3$		10.7	K0:	7	$+21.8 + 8.7$		$-11 + 2$		10.2	K0	7	$+48.3 -37.1$		$- 2 - 3$		11.5	...
8	$+37.1 +42.8$		$+ 2 - 5$		11.6	...	8	$+43.2 +21.4$		$- 8 - 4$		11.0	F0	8	$+59.0 +39.0$		$+ 9 + 1$		11.0	...

PROPER MOTIONS OF LONG PERIOD VARIABLES

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
RX Vul 457 M 11-15						RR Cap 277 M 7.8-14.6						Z Cap 182 M 8.6-15.0								
20 ^h 48.6 ^m +23° 00' 36° -14'						20 ^h 56.4 ^m -27° 29' 347° -41'						21 ^h 05.1 ^m -16° 35' 1° -39'								
+ 6 - 2						+10 -12						+ 7 - 8								
V	- 1.4	+ 5.6	- 7	-11	10.9	M9e	V	-28.6	- 6.7	+11	+ 8	9.9	M5e	V	-11.3	-10.7	-10	- 1	10.2	M2e
1	-38.4	+46.2	- 3	- 2	11.6	...	1	-68.8	-18.4	+ 3	- 3	10.3	G5	1	-53.7	-42.3	-19	+10	11.5	...
2	-36.7	-38.8	+ 8	+ 1	11.3	...	2	-68.3	-46.3	+ 9	+ 3	11.4	G5	2	-52.9	+26.6	-22	+ 9	11.6	...
3	-20.4	- 8.2	- 3	+ 2	10.3	K0	3	-43.4	- 7.6	- 3	-12	10.8	F8	3	- 8.5	- 1.8	+29	-14	10.9	K
4	-18.3	+12.4	- 1	- 1	10.9	G5	4	-26.8	+ 0.6	+ 7	+16	10.0	F5	4	- 7.5	+10.9	+11	- 5	10.8	K
5	+21.0	- 9.6	+ 4	+ 1	10.8	G5	5	-21.1	+38.5	-12	-11	11.9	G	5	+ 4.4	+50.0	+14	+ 5	11.6	...
6	+24.1	+ 2.9	- 3	+ 6	10.8	K0	6	-10.7	+ 3.2	- 4	+ 8	11.3	G	6	+14.0	-48.8	-24	+13	9.3	F2
7	+35.1	+43.2	+ 8	- 4	11.4	...	7	+ 7.6	+39.8	+ 7	-42	11.7	F	7	+49.7	+11.9	- 3	-10	11.3	...
8	+33.6	-48.1	- 9	- 3	12.1	...	8	+ 7.7	+21.6	- 8	+ 3	10.6	K0	8	+54.5	- 6.5	+14	- 9	10.2	K0
S Ind 400 M 7.9-17.0						9 +29.4 -24.3 +20 +34 12.1 K						Z Cap 182 M 8.6-15.0								
(Y) 20 ^h 49.0 ^m -54° 43' 310° -41'						10 +59.8 +28.9 +10 +26 12.0 G0						(Y) 21 ^h 05.1 ^m -16° 35' 1° -39'								
+ 9 -12						11 +62.8 - 8.9 +59 +25 10.5 G0						+ 8 - 9								
V	+48.8	+20.7	- 6	- 8	9.9	M5e	12 +71.8 -27.1 -86 -46 10.0 G0						V - 7.7 + 4.9 - 8 + 1 10.6 M2e							
+ 9 -12						R Vul 137 M 7.4-13.4						1								
20 ^h 59.9 ^m +23° 26' 38° -16'						+ 7 - 3						1 -67.4 -45.0 - 3 +15 11.5 G								
1	-70.2	-48.0	+27	+ 8	12.2	...	V - 9.1 +14.3 - 8 + 8 10.2 M5e						2 -54.2 -30.2 - 1 -10 11.5 F8							
2	-65.9	+21.2	+ 8	+21	11.2	...	1 -54.2 +34.8 - 3 - 1 10.3 K						3 -53.6 +45.9 + 9 +14 11.6 G							
3	-37.6	+21.2	- 7	-35	10.6	fg	2 -42.8 -36.5 - 2 +20 10.2 K5						4 -30.9 +31.9 - 4 -18 11.3 G0							
4	-24.4	- 0.1	+ 3	+13	12.0	...	3 -35.0 - 7.2 + 8 -19 10.5 G						5 +20.4 -37.2 -23 - 1 9.3 F2							
5	-17.2	-61.1	-32	-26	10.6	F8	4 -21.1 +26.5 - 3 + 1 10.4 ...						6 +59.5 +29.7 - 8 + 3 11.3 K							
6	-13.6	+65.8	+ 3	+20	10.4	G5	5 +13.4 +28.9 - 4 - 3 10.4 A0						7 +61.3 - 4.4 +28 - 4 11.7 G							
7	+ 8.8	-41.8	+ 1	+21	10.8	g	6 +26.3 -26.6 - 8 + 3 10.6 G5						8 +64.8 + 9.4 + 3 + 1 10.2 K0							
8	+27.6	- 5.9	-13	+18	10.4	...	7 +45.8 -47.2 + 3 - 3 9.8 K0													
9	+30.3	+32.6	-40	+12	11.2	...	8 +67.6 +27.3 +10 + 3 9.9 K0													
10	+49.5	+54.6	+39	-32	10.5	g	TW Cyg 342 M 8.9-15.0						AM Peg 137 SRa 9.0-11.0							
11	+51.9	+28.7	- 3	+15	11.7	...	21 ^h 01.7 ^m +29° 00' 43° -13'						21 ^h 05.4 ^m +12° 03' 30° -24'							
12	+60.8	-67.3	+16	-34	11.1	gK	+ 7 - 2						+ 9 - 5							
X Del 281 M 8.2-14.6						V +11.8 + 2.3 - 1 - 4 10.7 M9ep						V - 1.4 + 9.7 + 3 - 2 9.0 M2e								
20 ^h 50.3 ^m +17° 16' 32° -18'						1 -71.6 -29.8 + 4 - 2 11.0 ...						1 -43.4 -45.1 - 2 - 8 10.8 F0								
+ 9 - 5						2 -44.9 -28.1 + 7 - 2 9.4 K						2 -39.8 +34.7 - 2 + 8 10.9 ...								
V	- 7.9	- 9.7	+ 8	+ 5	10.0	M4e	3 -34.1 -29.9 - 3 - 7 9.8 K0						3 -36.4 -24.1 0 + 8 10.7 ...							
1	-14.2	-45.0	+ 1	+ 8	10.7	G0	4 - 9.5 -25.6 - 8 +11 10.2 K0						4 -32.0 +21.5 + 5 - 8 9.7 F5							
2	-17.5	-17.0	- 3	0	9.9	K2	5 +19.8 -31.1 - 5 + 5 10.6 K						5 +10.9 +17.9 +12 - 9 10.7 ...							
3	-10.4	+28.6	+ 2	+ 2	9.1	F0	6 +36.2 +30.2 + 1 - 4 10.9 K0						6 +42.2 +40.2 -14 + 9 9.5 K0							
4	- 3.4	+49.1	+ 1	-11	9.4	A5	7 +42.6 -21.3 - 6 - 1 10.5 K0						7 +41.4 -35.6 -16 - 8 10.2 K							
5	+ 8.7	+55.1	+ 3	- 9	10.9	F0	8 +61.5 +24.6 +10 0 10.4 K0						8 +57.1 - 9.5 +18 + 8 10.4 K0							
6	+36.9	+29.3	- 3	+ 9	8.9	F8	X Cep 534 M 8.1-16.0						RS Aqr 215 M 9.5-14.4							
UX Cyg 561 M 9.0-14.8						21 ^h 03.7 ^m -82° 40' 84° +24'						21 ^h 05.7 ^m -04° 26' 15° -34'								
20 ^h 50.9 ^m +30° 02' 42° -10'						+ 8 + 7						+10 - 9								
+ 5 - 1						V -14.3 +14.4 +15 +19 10.2 M5e						V + 0.3 + 1.0 - 8 +11 11.0 Me								
V	+10.2	+ 3.5	- 9	+ 2	11.4	M4e M5e	1 -66.5 13.5 0 + 3 11.4 K0						1 -60.1 -10.1 +41 +21 10.0 F5							
1	-61.5	- 9.5	+15	- 4	11.8	...	2 -61.8 +41.4 -16 -11 9.9 K0						2 -58.3 - 7.5 +13 +28 10.8 F2							
2	-35.9	+29.3	-29	+ 7	11.0	...	3 -19.7 -26.1 + 3 - 4 10.1 K0						3 -21.9 +21.5 +12 0 9.2 F2							
3	-18.6	-47.2	+ 1	+ 9	10.7	F0	4 -12.1 + 3.4 +14 -12 9.1 K2						4 - 2.4 -12.2 -64 -52 10.6 G5							
4	- 8.5	+47.5	+12	-12	11.6	...	5 +11.7 +16.3 - 7 - 8 10.7 K5						5 +19.9 +13.4 +27 + 6 10.6 F8							
5	+ 9.1	-52.3	+ 1	- 9	10.9	K0	6 +44.8 -27.6 + 7 - 3 9.5 A0						6 +22.6 + 8.7 -20 - 9 10.4 F8							
6	+27.2	+12.5	+16	- 7	11.7	...	7 +50.7 -39.4 -10 + 4 9.6 K0						7 +36.5 +14.3 -16 0 9.9 K0							
7	+42.8	+37.8	0	+12	11.1	...	8 +52.9 +45.5 +10 + 7 11.2 G5						8 +63.8 -28.1 +10 + 6 10.9 G0							
8	+45.4	-18.0	-17	+ 4	11.5	...														

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
RS Aqr 215 M 9.5-14.4							RR Aqr 182 M 9.1-14.4							S Mic 209 M 7.8-14.3						
(Y)	21 ^h 05.7 ^m	-04° 26'			15° -34'		(Y)	21 ^h 09.8 ^m	-03° 19'			16° -34'		(Y)	21 ^h 20.8 ^m	-30° 17'			344° -47'	
		+ 7 - 7							+ 9 - 7							+11 -12				
V	-12.7	+18.9	- 1	+ 2	11.8	Me	V	+ 3.4	- 9.5	+12	- 6	10.6	M2e M3e	V	+ 6.0	- 8.7	-28	+ 3	9.5	M3e
1	-77.3	+ 9.8	+14	0	10.8	F2	1	-24.9	-56.4	+ 5	+22	11.6	...	1	-88.1	-16.4	-29	+25	11.6	f
2	-72.4	-16.0	+16	+11	12.4	F	2	-69.3	+41.8	+ 6	+ 3	11.5	K	2	-76.0	- 8.2	+38	-55	10.6	g
3	-63.4	-51.0	-19	-12	12.3	G	3	-20.5	+29.3	- 2	-18	11.4	M3	3	-55.7	+36.2	+15	-11	11.0	g
4	-24.4	+52.8	-11	+ 1	10.9	K	4	-13.8	-20.4	- 8	- 8	11.9	...	4	-35.8	-11.5	- 6	+16	9.7	K0
5	+46.3	+65.3	-28	+18	11.1	F5	5	+18.3	+52.8	+ 7	- 2	11.6	...	5	-24.2	+18.9	-16	+21	11.9	...
6	+49.7	-70.7	+19	+10	10.7	G5	6	+25.0	-69.8	+ 4	+13	10.4	K5	6	-21.8	+ 9.2	- 2	+ 3	12.6	...
7	+62.9	-25.3	-16	- 9	11.8	F5	7	+69.2	+36.0	-11	+17	10.1	K5	7	+25.3	+ 9.0	- 5	+43	10.3	F6
8	+78.5	+35.0	+25	-19	11.5	...	8	+76.0	-13.2	0	-28	11.7	...	8	+30.7	+38.9	+ 4	-69	12.1	...
T Cep 390 M 5.4-11.0							X Peg 201 M 8.8-14.8							S Cep 487 M 7.4-12.9						
	21 ^h 08.2 ^m	+68° 05'			72° -13'			21 ^h 16.3 ^m	+14° 02'			24° -25'			21 ^h 36.3 ^m	+78° 11'			81° -19'	
		+ 9 + 5							+ 9 - 5							+ 7 + 4				
V	- 1.3	-17.2	-42	-48	10.2	M5e M7e	V	+ 8.5	- 3.4	-12	- 2	10.5	M2e M4e	V	-14.2	- 9.2	+11	+ 4	10.0	C74e
1	-57.5	-36.8	- 6	- 5	10.3	F0	1	-53.3	- 8.1	+ 1	-48	11.3	F8	1	-64.3	+16.0	- 9	-34	10.3	G5
2	-51.9	+45.1	+13	+14	9.9	M0	2	-43.8	- 6.2	+25	+25	11.0	K0	2	-33.0	+42.6	- 3	+12	9.1	A0
3	-42.4	+10.4	0	- 2	9.2	K0	3	- 4.4	+34.4	-26	+23	11.3	G5	3	-33.7	- 8.3	+ 5	+18	10.2	G5
4	-26.3	-25.7	- 7	- 7	10.5	F0	4	+ 4.4	-21.3	+13	+ 3	10.1	K0	4	-32.8	-33.0	+ 6	- 4	9.8	K0
5	+28.2	+12.8	+ 6	-21	10.1	F8	5	+14.4	+13.6	-21	0	10.9	K0	5	+22.9	-39.4	-11	-11	10.8	K0
6	+30.4	-31.5	- 6	- 7	9.6	G5	6	+23.1	+38.6	-17	+10	11.4	G	6	+38.7	+11.4	+15	+19	11.2	A0
7	+50.2	+18.4	-19	+ 8	10.5	K0	7	+25.6	- 7.0	+21	+13	9.8	2	7	+52.6	+47.8	- 4	+ 3	11.0	A0
8	+69.1	-12.7	+19	+20	10.0	F8	8	+34.0	-44.0	+ 4	-45	10.9	G	8	+49.6	-37.1	0	-10	11.1	F2
R Equ 261 M 8.7-15.0							T Cap 269 M 8.4-14.3							SS Cyg 50 UG 8.2-12.1						
	21 ^h 08.4 ^m	+12° 23'			31° -25'			21 ^h 16.3 ^m	-15° 35'			4° -42'			21 ^h 38.8 ^m	+43° 08'			58° - 8°	
		+ 8 - 5							+ 8 - 9							+ 2 - 1				
V	-14.0	+ 5.9	- 6	- 5	10.4	M3e M4e	V	-10.1	+11.3	- 6	- 9	10.7	M2e M3e	V	- 4.3	- 1.5	+11	-39	10.2	dGep
1	-66.7	-39.2	-32	- 5	11.6	...	1	-65.3	-34.0	+12	-18	11.6	...	1	-63.7	+ 6.6	-11	0	10.8	G0
2	-45.9	+46.8	-21	- 8	10.2	...	2	-63.5	+29.9	+13	+19	11.5	...	2	30.9	-33.1	+ 4	+ 5	10.5	A0
3	- 7.4	- 6.9	-55	+ 8	10.6	K0	3	-56.3	-24.2	-13	+15	11.3	G	3	-19.3	+35.0	- 7	- 5	10.0	G0
4	- 6.2	+28.4	- 3	+ 5	11.1	...	4	-47.6	- 9.8	-12	+ 1	11.6	...	4	+26.4	-34.4	+ 3	- 4	10.2	A
5	+ 6.4	-31.8	- 5	+ 4	10.0	K0	5	-18.7	+43.2	-14	- 1	11.3	K0	5	+12.5	+34.3	- 4	+ 5	10.1	G5
6	+29.7	-45.4	-18	- 7	10.9	K0	6	-13.5	+22.6	-35	-16	9.4	K0	6	-53.0	- 8.4	- 1	- 1	10.9	G5
7	+36.9	+19.1	+23	+11	10.1	F5	7	+19.6	+30.3	+ 7	+ 1	10.5	G							
8	+53.2	+29.6	0	- 7	9.9	A5	8	+27.4	-15.8	+19	+ 8	10.6	F8							
RR Aqr 182 M 9.1-14.4							RW Aqr 140 M 8.7-13.6							RR Peg 264 M 8.5-14.6						
	21 ^h 09.8 ^m	-03° 19'			16° -34'			21 ^h 18.0 ^m	+00° 25'			22° -34'			21 ^h 40.0 ^m	-24° 33'			46° -22'	
		+11 - 9							+ 8 - 6							-10 - 4				
V	- 2.4	- 4.2	- 5	- 6	10.0	M2e M3e	V	+ 7.9	-21.5	- 6	+ 1	10.6	M2e	V	+12.0	+12.6	-10	- 3	10.2	M4e M5e
1	-42.5	+21.0	+11	+22	8.7	K0	1	-52.0	+38.1	- 9	-14	11.6	F8	1	-43.9	+24.8	-10	+ 5	11.3	G
2	-27.0	-27.5	+55	-31	10.0	G0	2	-50.7	+20.9	- 2	0	11.9	A0	2	-40.9	-20.0	+ 9	+ 7	10.6	G0
3	-24.3	+30.9	- 6	-15	11.4	...	3	-48.5	-11.6	+13	+ 2	11.7	A	3	-38.1	+10.5	-20	- 5	10.0	F
4	- 7.9	-30.2	- 4	- 7	10.6	G	4	-27.3	-47.0	- 2	+12	12.0	...	4	-22.8	- 6.3	-18	- 7	10.7	K0
5	+17.5	-58.9	+ 4	+ 7	10.4	K5	5	+24.6	-20.6	+ 5	-13	10.5	G5	5	+ 2.5	-45.1	+ 8	+ 6	10.7	F
6	+57.2	+37.2	- 4	- 7	10.1	K5	6	+37.9	-42.9	-16	- 1	10.0	G5	6	+35.1	+47.0	+ 1	+ 6	11.8	K0
							7	+48.9	+40.9	- 1	- 6	11.7	...	7	+35.5	+12.9	- 9	- 5	10.2	K5
							8	+67.1	+22.2	+12	+20	11.6	...	8	+72.6	-23.8	+ 1	- 6	10.8	G5

No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
TU Peg 322 M 8.2-13.8							S PsA 272 M 8.0-13.4							Y Peg 207 M 9.6-16.0						
	$21^h 40.2^m$		$+12'' 14'$			$37'' -31'$	(Y)	$21^h 58.1^m$		$-28'' 32'$			$349'' -54'$		$22^h 06.8^m$		$+13'' 52'$			$43'' -34'$
			$+10 - 6$							$+ 7 - 7$							$+10 - 5$			
V	- 7.4	- 7.7	- 5	-11	10.7	Me	V	+30.9	- 2.0	+10	+ 2	12.9	M3e M5e	V	- 6.5	- 7.9	-23	+18	10.8	M3e
1	-51.8	+ 2.3	+22	+ 5	10.6	...	1	-64.8	-26.0	-17	+ 9	12.7	...	1	-61.7	-37.6	-16	+23	11.1	...
2	-35.0	-14.7	+ 6	+14	11.3	...	2	-59.4	-50.2	+32	+ 3	13.2	...	2	-49.6	+45.7	+30	-54	11.1	G0
3	-28.5	+29.2	-22	-19	11.6	...	3	-41.7	+40.1	+20	-14	11.8	...	3	-34.7	-41.5	-10	+ 9	11.4	...
4	- 8.5	-30.1	- 6	0	10.5	...	4	-37.0	+ 5.4	+14	+28	12.6	...	4	-13.7	+44.8	- 4	+22	11.3	K0
5	+17.9	-26.0	+ 3	- 6	10.6	...	5	- 9.5	+26.7	-35	-31	12.2	...	5	+15.2	-26.0	-21	+ 5	11.4	...
6	+31.1	+19.8	+ 7	-19	10.0	G5	6	- 9.4	-16.6	-14	+ 5	12.4	...	6	+18.0	+27.9	-16	+20	11.0	K5
7	+32.8	+32.1	- 7	+34	10.2	K	7	+14.2	-45.7	-38	- 8	13.3	...	7	+57.4	+20.0	-11	+11	10.7	F8
8	+42.0	-12.6	- 4	- 9	11.9	...	8	+30.9	+49.1	- 7	+ 7	13.1	...	8	+69.1	-33.3	+47	-36	11.2	K0
R Gru 332 M 7.4-14.9							9	+35.2	+38.1	+10	+14	13.7	...							
(Y)	$21^h 42.1^m$		$-47'' 23'$			$318'' -51'$	10	+36.8	-24.7	0	+ 9	13.1	...							
			$+11 -11$				11	+41.9	-31.2	+38	-18	12.2	...							
							12	+62.8	+35.2	- 3	- 4	13.1	...							
V -12.4 - 7.4 + 9 + 2 10.6 M5e							RT Peg 215 M 9.4-15.0							RS Peg 413 M 8.2-14.6						
								$21^h 59.8^m$		$+34'' 38'$			$56'' -17'$		$22^h 07.4^m$		$+14'' 04'$			$43'' -34'$
										$+ 8 - 2$							$+ 9 - 5$			
1	-83.6	-42.9	-24	+ 3	11.0	GK														
2	-45.7	+43.0	+19	0	12.5	...														
3	-44.3	+16.3	-10	+ 4	12.6	...														
4	-37.7	-67.5	-11	+ 9	10.9	...														
5	-29.7	+32.1	- 6	- 1	12.2	...														
6	- 3.5	-22.7	+32	-14	11.8	...														
7	+ 8.9	-28.7	+27	- 3	11.4	G3														
8	+17.0	+64.9	+14	+16	11.6	...														
9	+38.0	-15.5	0	+16	12.0	...														
10	+40.8	+10.7	+12	+ 9	10.7	G5														
11	+56.8	+61.8	-29	-28	12.1	F														
12	+83.0	-51.5	-24	-11	12.0	...														
V - 7.9 - 6.7 +10 + 3 10.2 M4e							V - 7.9 - 6.7 +10 + 3 10.2 M4e							V + 1.7 + 6.4 + 4 +23 10.0 M7e						
1	-48.3	+17.5	-70	-43	10.2	G5	1	-48.3	+17.5	-70	-43	10.2	G5	V	+ 1.7	+ 6.4	+ 4	+23	10.0	M7e
2	-42.9	-38.6	+25	+14	10.4	A0	2	-42.9	-38.6	+25	+14	10.4	A0	1	-69.0	+25.8	+19	-64	11.1	F8
3	-15.4	-34.5	+10	+14	10.3	A0	3	-15.4	-34.5	+10	+14	10.3	A0	2	-40.1	+ 1.3	-10	+ 3	10.8	K2
4	-13.7	+41.2	+35	+15	11.1	...	4	-13.7	+41.2	+35	+15	11.1	...	3	-33.2	+26.4	- 4	+22	11.5	K0
5	+ 5.3	+27.1	+10	+17	10.5	G5	5	+ 5.3	+27.1	+10	+17	10.5	G5	4	-21.5	-13.3	+17	+23	9.6	K0
6	+35.0	+40.1	+25	+10	10.3	K0	6	+35.0	+40.1	+25	+10	10.3	K0	5	- 3.1	-44.0	-21	-15	11.6	K0
7	+36.6	-23.5	-22	-35	11.2	G5	7	+36.6	-23.5	-22	-35	11.2	G5	6	- 3.4	+39.3	+14	+16	11.9	K0
8	+43.4	-29.3	-13	+ 7	11.5	G	8	+43.4	-29.3	-13	+ 7	11.5	G	7	- 1.2	+ 9.8	-16	+15	11.0	K0
V + 9.1 + 5.8 +18 0 10.3 M6e							RZ Peg 439 M 7.6-13.6							9 +19.9 +42.6 - 3 + 8 10.9 M0						
								$22^h 01.5^m$		$+33'' 01'$			$56'' -18'$	10	+30.1	-28.9	-38	-26	10.6	K0
			$+ 7 0$							$+ 9 - 2$				11	+45.5	-18.3	+ 2	+ 5	11.4	K0
V	+ 9.1	+ 5.8	+18	0	10.3	M6e	V	+18.3	- 2.0	- 6	+ 3	10.5	C9e	12	+62.1	-13.8	+33	+ 3	11.6	K0
1	-60.4	+ 9.8	+10	+14	11.0	F8	1	-34.3	+36.1	+12	+ 8	10.8	G5							
2	-39.5	-10.9	+14	+11	10.8	A0	2	-34.6	-38.6	-12	+10	10.4	F2							
3	-28.7	-41.7	-24	-17	10.7	G0	3	-23.2	+36.5	+ 1	+ 9	11.7	K0							
4	-16.2	+41.3	+ 1	- 7	10.8	A2	4	-17.3	-38.8	- 1	-28	10.2	G0							
5	+25.8	+42.1	+ 3	0	10.2	K0	5	+ 4.2	+31.5	- 6	- 2	10.6	K0							
6	+28.6	-35.5	+ 1	+ 1	10.7	F0	6	+16.2	-26.9	+15	+25	10.0	F2							
7	+40.5	+15.3	-14	- 6	10.5	G	7	+34.4	+14.6	- 7	-15	9.6	K0							
8	+49.9	-14.4	+ 9	+ 5	10.8	A0	8	+54.6	-14.5	- 2	- 7	11.0	K0							
V - 8.3 + 8.4 + 6 + 4 10.2 M5e							V +18.3 - 2.0 - 6 + 3 10.5 C9e							SS Aqr 193 M 8.6-13.2						
															$22^h 14.5^m$		$-14'' 54'$			$14'' -54'$
			$+13 - 8$														$+16 -12$			
V	- 8.3	+ 8.4	+ 6	+ 4	10.2	M3e M5e	V	+ 6.7	+ 1.2	-11	+29	11.5	M7e	V	- 2.2	-12.0	-19	-22	10.7	M2e
1	-43.4	+ 2.2	-22	-20	10.2	G0	1	-67.3	-31.9	-30	-40	11.6	K0	1	-57.7	-52.1	+38	+ 8	9.1	G5
2	-20.6	+44.7	-12	-14	9.7	K2	2	-54.5	+14.7	0	+24	11.4	K2	2	-44.6	+38.6	-15	+19	9.7	F8
3	-15.8	-36.8	-15	+ 4	10.8	G5	3	-32.8	+15.6	-13	+26	10.5	K0	3	-42.3	-12.4	-15	-52	9.7	K0
4	- 7.9	-40.7	+31	+ 9	8.7	G	4	-14.2	-39.9	-17	- 9	11.6	K2	4	-24.2	+14.0	+12	-47	11.1	...
5	- 4.2	+20.7	+18	+21	10.8	G5	5	+26.5	+43.4	+27	-86	11.0	A5	5	-17.1	+22.2	+17	-10	10.8	...
6	+ 2.8	+18.2	+21	+12	10.6	G	6	+40.2	+27.2	-13	+36	10.6	K2	6	-13.6	+ 3.6	+ 4	-33	9.8	F2
7	+28.9	+38.1	- 5	+ 1	10.4	K	7	+42.0	- 6.8	-14	+21	11.5	K0	7	- 6.7	+28.2	-40	+15	9.4	F5
8	+60.2	-46.4	-16	-14	10.5	K0	8	+60.1	-22.3	0	+29	11.8	K0	8	+22.5	-38.7	-12	-35	9.1	F2
V - 2.2 -12.0 -19 -22 10.7 M2e							T Peg 374 M 8.7-15.4							9 +29.2 -36.2 -15 -26 11.4 F8						
								$22^h 04.0^m$		$+12'' 03'$			$41'' -35'$	10	+42.7	+12.2	+31	- 9	11.7	...
										$+ 8 - 4$				11	+44.8	+42.7	- 9	+64	11.6	...
1	-57.7	-52.1	+38	+ 8	9.1	G5	V	+ 6.7	+ 1.2	-11	+29	11.5	M7e	12	+67.0	-22.1	+ 5	+ 6	8.7	K5
2	-44.6	+38.6	-15	+19	9.7	F8	1	-67.3	-31.9	-30	-40	11.6	K0							
3	-42.3	-12.4	-15	-52	9.7	K0	2	-54.5	+14.7	0	+24	11.4	K2							
4	-24.2	+14.0	+12	-47	11.1	...	3	-32.8	+15.6	-13	+26	10.5	K0							
5	-17.1	+22.2	+17	-10	10.8	...	4	-14.2	-39.9	-17	- 9	11.6	K2							
6	-13.6	+ 3.6	+ 4	-33	9.8	F2	5	+26.5	+43.4	+27	-86	11.0	A5							
7	- 6.7	+28.2	-40	+15	9.4	F5	6	+40.2	+27.2	-13	+36	10.6	K2							
8	+22.5	-38.7	-12	-35	9.1	F2	7	+42.0	- 6.8	-14	+21	11.5	K0							
9	+29.2	-36.2	-15	-26	11.4	F8	8	+60.1	-22.3	0	+29	11.8	K0							
10	+42.7	+12.2	+31	- 9	11.7	...														
11	+44.8	+42.7	- 9	+64	11.6	...														
12	+67.0	-22.1	+ 5	+ 6	8.7	K5														

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No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp	No.	X	Y	μ_α	μ_δ	m	Sp
R Peg 378 M 7.1-13.8							S Peg 319 M 7.4-13.8							R Aqr 387 M 5.8-11.5						
		$23^h 01.6^m$		$+10^\circ 00'$		$54^\circ -45'$			$23^h 15.5^m$		$+08^\circ 22'$		$58^\circ -48'$			$23^h 38.7^m$		$-15^\circ 50'$		$37^\circ -71'$
				$+14 - 8$							$+15 - 9$							$+16 -10$		
V	0.0	-11.0	+4	+3	10.4	M6e	V	-23.4	-14.0	-26	-22	9.6	M8e	V	-6.8	-7.7	+43	-28	10.4	M7e+Pec.
1	-53.8	+43.8	+10	+25	10.2	K0:	1	-61.0	+41.8	-10	-17	11.0	G:	1	-78.1	-36.9	-5	+10	10.7	G5
2	-49.9	+4.5	-57	-81	11.7	...	2	-55.5	+3.0	+4	-3	10.0	K0:	2	-50.4	-36.5	-15	-13	10.4	G0
3	-31.4	-44.1	+16	+19	11.3	...	3	-46.2	-31.0	-16	-5	9.7	K0	3	-29.9	+27.4	+10	+7	10.7	G:
4	-22.5	-24.9	+1	+3	11.0	G:	4	-28.8	+18.6	+9	+14	9.9	K0	4	-29.7	+27.6	+10	+6	10.5	G:
5	-20.3	+30.8	+46	+14	11.6	...	5	-25.3	-47.2	+3	+7	10.9	...	5	(-28.7	-35.2)	(+52	-10)	10.7	G0
6	-7.8	+3.5	-27	-22	10.9	K0:	6	-23.6	+19.5	+10	+3	11.1	G:	6	+17.4	+44.4	-12	+9	9.3	F0
7	-4.9	+8.8	+12	+18	12.0	...	7	+21.1	+4.9	0	+9	11.3	...	7	(+40.8	-27.5)	(-82	-37)	10.7	G:
8	+6.7	+29.6	+8	+11	12.0	...	8	+30.3	+19.0	-3	-9	10.5	...	8	+47.9	+10.8	-8	-22	11.0	...
9	+12.4	-39.5	+28	+5	9.9	K0	9	+39.6	-23.5	+8	+5	11.6	...	9	+61.1	-18.7	+9	+20	9.6	G:
10	+33.1	+48.5	+16	+11	11.8	...	10	+43.3	+31.0	-7	-13	11.2	...	10	+61.7	-18.1	+11	+30	12.8	...
11	-67.6	-55.6	-42	-31	10.2	G:	11	+51.7	+19.1	-1	-10	11.3	...							
12	+70.8	-5.4	+2	+16	8.4	K2	12	+54.4	-55.2	+5	-7	10.7	G5							
UZ Cep 297 M 11.3-15							Z Cas 496 M 9.4-15.0													
		$23^h 04.6^m$		$+70^\circ 04'$		$82^\circ +10'$			$23^h 39.7^m$		$+56^\circ 02'$		$82^\circ -5'$					$+4 - 1$		
				$+9 0$																
V	-5.4	-4.3	+3	+1	10.3	M5								V	+2.2	+2.6	+9	-3	10.3	M7e
1	-59.6	-23.8	-7	-7	11.1	G5								1	-46.3	+3.7	-7	-9	10.0	A2
2	-41.9	+27.7	+4	+7	11.1	A0								2	-45.3	+31.1	+6	+5	11.0	A0
3	-38.6	+33.8	+6	-4	10.0	K0								3	-32.1	-30.1	+5	+2	10.6	A2
4	-33.9	-20.7	-3	+3	11.5	A0								4	-10.5	-32.4	-4	+2	10.4	A0
5	+5.1	-10.5	+4	+3	10.8	A0								5	+16.0	-10.2	0	+1	11.1	A0
6	+52.1	-46.6	+6	+1	9.9	K0								6	+17.7	-20.8	-2	-5	11.6	A0
7	+54.5	+22.3	-7	+2	9.7	K5								7	+35.9	+17.6	-2	+1	10.5	A0
8	+62.3	+17.9	-4	-5	9.3	K5								8	+64.5	+41.2	+3	+3	10.9	A0
V Cas 228 M 7.3-12.8							RY Cep 149 M 9.4-13.6													
		$23^h 07.4^m$		$+59^\circ 09'$		$78^\circ -1'$			$23^h 18.1^m$		$+78^\circ 25'$		$86^\circ +17'$							
				$+6 - 1$							$+8 0$									
V	+6.4	+14.2	+15	-10	10.5	M7e	V	+8.7	-4.8	+2	+17	10.3	M0e							
1	-57.0	-35.5	-7	-2	10.8	A0	1	-49.2	+41.1	+3	+1	11.4	A0							
2	-50.0	+37.2	-1	+1	11.2	A0	2	-36.1	+32.6	-6	-1	11.2	K:							
3	-39.3	-22.8	+15	+4	10.3	A0	3	-33.1	-51.3	+12	+12	10.2	K5							
4	-6.8	+37.1	-7	-3	11.0	A0	4	-14.1	-20.4	-8	-12	10.6	...							
5	+21.9	-15.6	-1	0	11.1	F2	5	+13.9	+10.4	+8	+11	11.4	...							
6	+24.0	+24.1	-5	-6	10.1	A0	6	+16.1	-8.0	-10	-5	11.7	...							
7	+43.9	-45.5	-7	-2	10.0	A0	7	+44.8	+39.9	-4	-10	9.9	K0							
8	+63.3	+21.0	+13	+8	10.4	F0	8	+57.6	-44.2	+6	+5	11.4	K:							
W Peg 344 M 7.9-13.0							ST And 330 SPa 8.2-11.8							RR Cas 300 M 10.1-14.4						
		$23^h 14.9^m$		$+25^\circ 44'$		$67^\circ -32'$			$23^h 33.8^m$		$+35^\circ 13'$		$75^\circ -25'$			$23^h 50.8^m$		$+53^\circ 10'$		$83^\circ -8'$
				$+11 - 5$							$+10 - 4$							$+7 - 2$		
V	+6.0	-6.2	+1	+1	10.8	M8e	V	-6.5	+0.9	-4	-7	10.6	R3e	V	-1.7	-0.4	-1	0	10.4	M5e
1	-71.5	+32.0	-10	+4	10.6	K0	1	-67.2	+15.2	+11	+1	10.7	A0	1	-58.1	+43.7	+7	+1	10.6	A:
2	-49.1	-32.9	+2	+8	11.5	G:	2	-48.3	+52.2	-10	-8	9.4	K0	2	-53.2	-45.3	-11	+4	10.8	K0
3	-11.3	+29.0	+2	-14	8.2	A0:	3	-34.3	-32.2	0	-1	11.2	K:	3	-20.3	+31.9	+2	-4	10.5	A0
4	-2.4	-28.0	+6	+2	10.3	K0	4	-19.9	-39.6	-1	+7	10.3	...	4	-16.1	-23.5	+1	0	11.1	...
5	+11.9	-20.0	-8	-8	11.1	G5	5	+17.1	-17.7	+3	-6	10.5	K:	5	+15.1	-30.5	+5	-7	10.4	F0
6	+24.3	+21.0	+5	+24	10.8	K0	6	+43.4	+41.6	+3	+11	11.4	...	6	+33.4	-14.4	+4	+3	11.1	...
7	+46.3	+15.8	+3	-14	11.4	...	7	+46.0	-49.6	-2	0	10.8	...	7	+46.7	+5.3	+1	-9	10.3	A2
8	+51.8	-16.9	0	-2	11.0	K5	8	+63.2	+30.1	-4	-4	10.7	G:	8	+52.5	+33.7	-10	+12	11.5	...

No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp	No.	X	Y	μ_{α}	μ_{δ}	m	Sp
R Phe 268 M 7.5-14.4							Z Peg 325 M 7.7-13.6							Y Cas 414 M 8.9-15.3						
(Y)	23 ^h 51.3 ^m		-50° 21'		289° -66°			23 ^h 55.0 ^m		+25° 20'		78° -36°			23 ^h 58.7 ^m		+55° 07'		84° -6°	
			+13 -6							+9 -5							+8 -3			
V	+3.0	+1.8	-25	+4	10.8	M3e	V	+8.4	+11.5	0	-8	10.6	M6e M7e	V	-5.9	-0.3	-5	+1	10.3	M8e
1	-86.2	+46.2	+32	+1	11.3	F5	1	-63.8	-18.6	+5	+2	10.6	K:	1	-45.0	+22.6	-5	+1	10.3	K0
2	-52.0	+6.6	+3	-4	11.7	F8	2	-62.9	+18.4	+25	-1	11.5	K:	2	-36.2	+42.2	-2	+3	10.0	F0
3	-36.3	-34.0	+26	-14	11.0	G5	3	-31.9	+30.0	-27	-12	10.9	F8	3	-36.3	-40.0	+9	+4	9.9	K0
4	-19.4	+67.5	-39	+15	12.4	...	4	-9.5	-33.4	-3	+11	11.1	K:	4	-11.7	-20.8	-3	-7	10.0	K0
5	-11.1	-37.8	-30	-34	11.9	fg	5	+2.8	-39.2	+9	-4	11.3	K:	5	+4.8	-24.5	0	-1	10.4	A2
6	-10.8	-59.0	+7	+9	10.5	F7	6	+50.1	-35.3	-12	-9	11.9	...	6	+14.6	+6.9	+11	-1	10.0	A5
7	+17.4	-27.6	-20	+1	12.3	...	7	+53.4	+47.9	-42	-5	12.3	...	7	+47.2	+28.7	-4	-2	10.7	A0
8	+21.7	+55.4	-61	+8	11.4	G5:	8	+61.8	+30.2	+44	+18	11.4	K:	8	+62.6	-15.1	-7	+4	10.5	A2
9	+30.6	-33.3	-8	+8	12.4	...														
10	+38.8	-65.8	+27	+3	11.5	F5														
11	+47.4	+65.7	-42	+7	11.5	...														
12	+60.0	+16.1	+105	-26	11.8	...														
V Cet 260 M 8.6-14.6							W Cet 351 M 7.1-14.6							SV And 316 M 7.7-14.3						
	23 ^h 52.8 ^m		-09° 31'		57° -68°			23 ^h 57.0 ^m		-15° 14'		50° -74°			23 ^h 59.2 ^m		+39° 33'		81° -22°	
			+16 -9							+16 -9							+14 -6			
V	+8.1	+0.6	-24	+1	9.9	M3e	V	-2.0	+17.6	-33	+11	10.6	S7.3e	V	+7.5	-18.3	-1	+9	10.1	M6e
1	-73.5	-15.1	+16	0	11.3	...	1	(-74.5	+49.0	(+123	+29)	9.0	K0	1	-71.6	-26.3	-7	+1	9.8	F2
2	-59.8	-56.6	+7	-15	11.5	...	2	-72.8	+18.0	0	-8	11.4	...	2	-62.1	+41.8	+1	+24	10.4	K5
3	-54.6	+2.1	+15	+11	9.8	K0	3	-9.0	-34.3	0	+8	9.9	G5	3	-38.0	-43.6	+15	+14	9.1	A0
4	-48.8	+35.0	+8	-8	10.3	F8	4	+4.2	+38.8	0	+8	12.1	...	4	-36.6	+41.9	-9	-39	10.2	G:
5	-37.3	+41.1	-38	+6	10.4	K0	5	+17.1	-6.3	+13	-10	11.8	...	5	+25.7	-18.2	-16	0	10.8	G0
6	-23.1	-4.5	-9	+7	11.6	...	6	-60.5	-16.2	-13	+3	10.6	G0	6	+47.5	-58.1	-25	-14	10.9	F8
7	+6.0	+28.7	-3	+5	11.7	...								7	+66.4	+30.2	-3	+21	11.7	...
8	+44.4	-50.7	-21	-8	12.2	...								8	+68.7	+32.3	+11	-6	10.4	K5
9	+46.7	+24.0	+1	+11	9.1	F8														
10	+51.8	+9.8	+17	-25	11.3	G:														
11	+73.2	-50.7	+26	-12	10.4	K0														
12	+74.9	-3.0	-19	+4	11.4	...														
R Cas 431 M 5.5-13.0							W Cet 352 M 7.1-14.6													
	23 ^h 53.3 ^m		+50° 50'		83° -10°		(Y)	23 ^h 57.0 ^m		-15° 14'		50° -74°								
			+6 -2							+13 -6										
V	+7.5	-17.6	+86	+19	10.2	M6e M8e	V	-8.9	+10.1	+1	+6	11.6	S7.3e							
1	-68.9	-31.4	-10	-2	10.9	A:	1	-77.8	+53.7	-22	-14	11.8	...							
2	-59.1	+52.6	+1	-2	10.7	F:	2	-74.8	-57.6	+2	-16	12.1	...							
3	-18.2	-39.4	+7	+6	11.1	A:	3	-55.9	-27.8	+13	+10	12.4	...							
4	-17.9	+35.9	+2	-1	10.5	F0:	4	-31.3	+25.1	0	+4	11.5	...							
5	+2.8	+42.3	-25	-6	10.2	A:	5	-17.4	-47.0	-15	+28	9.9	G5							
6	+11.4	-29.0	+3	-3	9.4	A2	6	-1.7	+33.4	+23	-11	12.1	...							
7	+71.6	-48.1	+1	0	9.7	A0	7	+4.8	+57.7	+19	+12	11.5	...							
8	+78.2	+17.0	+22	+9	10.0	K0	8	+1.6	-16.5	+14	-6	11.8	...							
							9	+56.1	+17.7	-4	+3	12.4	...							
							10	+57.0	+9.7	-16	+5	12.2	...							
							11	+59.4	-28.0	-5	+3	10.6	G0							
							12	+69.7	-20.5	-9	-18	12.0	...							

END
OF
THE
CATALOGUE

ABSOLUTE PROPER MOTIONS SECULAR PARALLAXES, ABSOLUTE MAGNITUDES AND SPACE VELOCITIES OF MIRA TYPE VARIABLES

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Abstract. The radial velocities by Merrill and the proper motions derived by Alden and Osvalds (1961) from McCormick and Yale plates have been used to determine the mean distances and absolute magnitudes of 345 variables, of which 324 are Mira type, 18 are SRa and 3 are SRb. In general, the variables have been divided according to their period range into 8 groups of Mira stars (Se stars were singled out occasionally for some point of interest) and a group of 26 carbon stars.

Space velocities of 284 of these variables have been determined, the exclusion of 57 being necessary for lack of radial velocities. When these become available the arrangement of our material allows an easy incorporation into the present results.

The significant feature of this paper is the homogeneous set of proper motions. A comparison of the absolute magnitudes with those from other sources is given in Table V which reveals an acceptable agreement for variables with periods less than 300 days, but shows our magnitudes about one magnitude brighter than those of other sources for variables with periods greater than 300 days. The exception is the compilation by Miczka which agrees well with ours for all except the longest periods.

In Table VII we show our space velocities with their dispersions in comparison with the results of other authors. As seen in Figures 2 and 4 our investigation indicates that Mira variables with periods less than 300 days move farther from the galactic plane, in orbits of greater inclination than those with periods more than 300 days.

For the computation of the interstellar absorption Parenago's formula has been used and the results are found to agree satisfactorily with observations by Gascoigne and Eggen. An average systematic difference of 0.13 mag. between the mean maximum magnitudes by Campbell and those given in the General Catalogue of Variable Stars has been noticed.

The reality of the considerably greater brightness and large average space velocity of the group of Mira variables with periods less than 225 days probably could be determined definitely if radial velocities and proper motions were available for all known stars in this period group.

For other remarks see the abstract and introduction of the preceding paper by Alden and Osvalds.

1 Data for Variables and Comparison Stars.

In addition to the relative proper motions of 345 variables, mentioned above, the relative proper motions of the following variables determined by Vyssotsky and Williams (1948) were at our disposal: another determination for R Comae Berenices, $\mu_\alpha \cos \delta = +0''.001$, $\mu_\delta = +0''.010$ (page 120); T Virginis, $\mu_\alpha \cos \delta = +0''.012$, $\mu_\delta = +0''.019$ (page 121); the absolute motions used were $+0''.001$ and $+0''.012$ respectively; R Hydrae, two determinations (page 124), the mean absolute motions used for combining them with those of Yale were $\mu_\alpha \cos \delta = -0''.050$, $\mu_\delta = -0''.004$. In general, a straight mean was taken in case two proper motion determinations of the same star were available. This was also done in combining the motions of the 22 stars in Section III and Table I.

Soon after we began work on this paper, the second edition of the General Catalogue of Varia-

ble Stars (1958) was published. In it Mira and Long-Period variables were re-examined and replaced by the six classes M (Mira), SR, SRa, SRb, SRc and SRd. In accord with this grouping our sample of 346 variables includes 324 Mira, 18 SRa, 3 SRb and 1 SRd stars. While all but two of them can be individually identified in the Catalogue of Proper Motions (page 115), for convenience those stars which do not fall into the Mira category are listed below:

SRa: RU And, ST And, Z Aqr, S Aql, S Aur, V Boo, S Cam, V CVn, T Cen, RZ Cyg, RS Dra, W Hya, TT Peg, AK Peg, AM Peg, R UMi, RU Vul.

SRb: V Aqr, X Mon, U Boo

SRd: Z Aur

After a helpful discussion with the late Dr. P. W. Merrill and with Dr. P. C. Keenan we decided

to retain for our solution all the stars in the sample with exception of Z Aur. A recent paper by Merrill (1960) in which he says that "the SRa variables may be considered as the short-period end of the Mira group rather than as a physically separate kind of variable" adds to the justification of our choice.

In the Catalogue of Proper Motions (page 115) data are given for each of the Mira type variables. These include the period, spectrum, apparent mean maximum visual magnitude, radial velocity, and the relative proper motion of the variable ($\mu_a \cos \delta$ and μ_δ) with respect to the reference stars. The determination of these relative motions has been described by Alden and Osvalds (1961).

For practically all of the reference stars in the McCormick part the spectra had been determined on our 10-inch camera spectral plates by Joanne McNutt and Wanda Porterfield, and their magnitudes by S. A. Mitchell (1935), but for about 500 of the reference stars on the Yale plates, we lacked either spectrum or magnitude or both. Through the kindness of the Harvard Observatory the series of MF (Metcalf telescope F) plates were made available to us, and Dr. Dorrit Hoffleit determined the spectra of approximately 300 of them. In addition she was able to classify about 70 other field stars with known visual magnitudes given on AAVSO charts. The spectra of the latter ones were used in the determination of unknown visual magnitudes of the reference stars.

To determine the magnitudes of the remaining stars, a graph of the relation of the photographic magnitudes and diameters was made. On this graph were plotted: 1) stars with known spectrum and visual magnitude, converted to photographic (from the Henry Draper Catalogue); 2) stars with unknown spectrum but given visual magnitude (converted to photographic). For these stars a mean color index by E.T.R. Williams (1934 Table III) was used, 0.5 mag. for $0^\circ < b^l < 20^\circ$, 0.6 mag. for $b^l \geq 20^\circ$ where b^l is the galactic latitude on the old system; 3) grating photographic magnitudes for the first order spectrum of the bright H.D. stars where the grating constant was 5.0 mag. A free hand curve was drawn through these points and then the mean photographic magnitudes of the reference stars according to their measured diameters were found.

The difference, $\Delta m_{pg} = m_{pg} - \bar{m}_{pg}$, was derived in each plate region for all the stars with known magnitudes; m_{pg} is the previously known magnitude and $\bar{m}_{pg}$ is the magnitude for a particular star read from the curve. These differences gave the expected evidence of a systematic difference between the given and the derived magnitudes in

a particular region, the main cause being the not accurately known exposure time of the individual regions. The determined magnitudes were corrected for the systematic differences. These photographic magnitudes were converted back into photovisual ones by the color index when the spectrum was available, or by applying the mean color indices mentioned above when the spectrum was not known. The probable error of one magnitude determination was found to be ± 0.35 mag. Using all the available magnitudes of the reference stars, the magnitude scale appears to be dependable to about 0.2 mag. which has been considered sufficient for obtaining the secular parallax. Fig. 1 shows the general shape of the magnitude-diameter array.

II Reduction of Relative Proper Motions to Absolute

The proper motions of these Mira variables have been measured relative to a set of field stars, whose absolute motions are unknown. Since the effect of differential rotation and that of precessional motion are identical for the variable and its reference stars, it is not necessary to consider these two effects in the determination of the mean parallax. The mean value of the parallactic motion of the reference stars must be computed, however, and added to the relative motion of the variable. This mean value is found by assigning to each reference star, depending on its magnitude and spectral class, the value of its secular parallax.

For each of the comparison stars, the secular parallax h/r was found from one of the following sources: 1) for stars of known spectrum and $m_{pv} \leq 11.4$, values were derived from Table 8.VII by Vyssotsky and Williams (1948), and 2) for stars with $m_{pv} \geq 11.0$ and unknown spectrum, the values were found in Table 8 by Binnendijk (1943).

For the relatively few stars brighter than $m_{pv} = 11.4$ with only indicated late spectrum a smoothed value of the secular parallax was used. This value was found by applying the derived percentages of the spectra based on the frequency of spectral types within latitude zones and magnitude range, as given in Bergedorfer Spektraldurchmusterung (1935). The percentages are 20% G5 and 80% K-K2 type stars. For each variable the mean value of h/r for its reference stars was determined, and the parallactic motions $\Delta \mu_\alpha$ and $\Delta \mu_\delta$ were found from the equations

$$\begin{aligned} P_\alpha \times (\bar{h}/r) &= \Delta \mu_\alpha \\ P_\delta \times (\bar{h}/r) &= \Delta \mu_\delta \end{aligned}$$

where P_α and P_δ are the parallax factors taken from Bok's (1931) Tables 11 and 12.

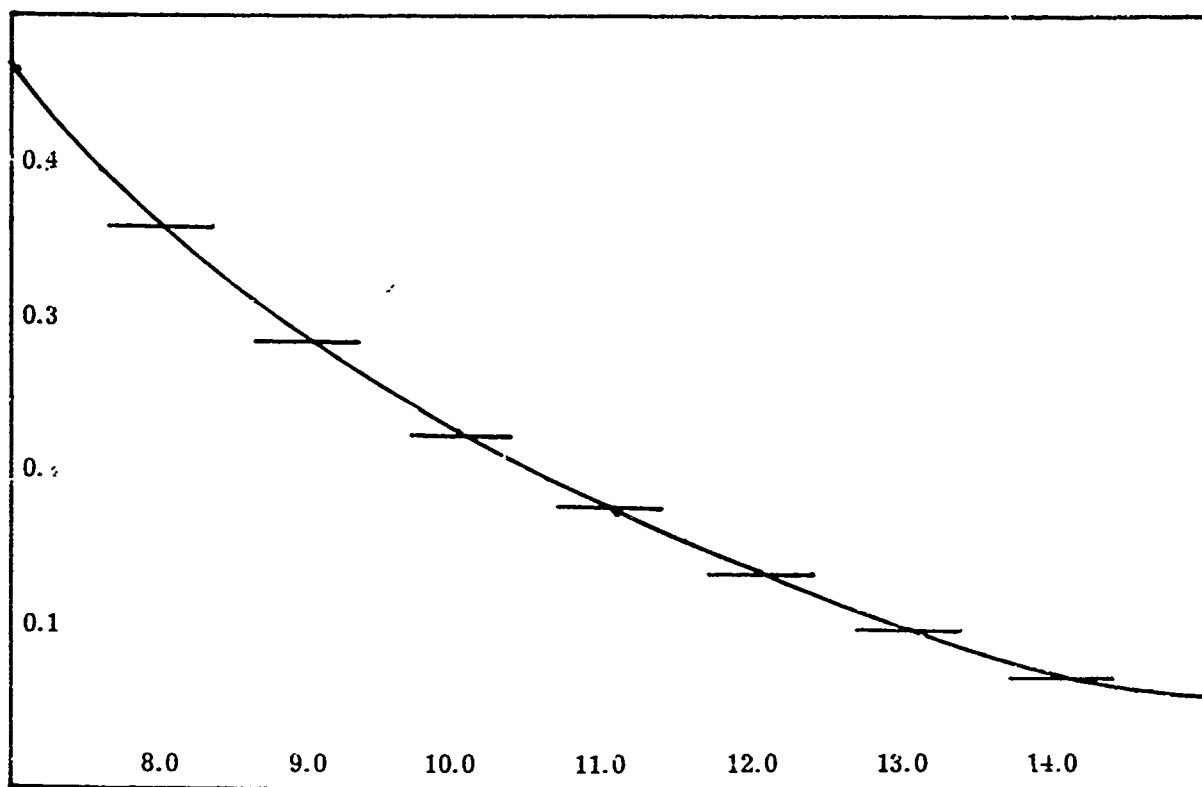


Fig. 1. Diameters in mm versus photographic magnitudes. Yale regions. Horizontal lines represent p. e. of one star, ± 0.35 mag.

The absolute proper motion of a variable now can be found from the expressions:

$$\begin{aligned}\Delta\mu_\alpha + \mu_\alpha \cos\delta &= \mu_\alpha \cos\delta \text{ (abs.)} \\ \Delta\mu_\delta + \mu_\delta &= \mu_\delta \text{ (abs.)}\end{aligned}$$

In the Catalogue of Proper Motions (page 115), on the third line for each variable the mean parallactic motion in R.A., $\Delta\mu_\alpha$, and in Decl., $\Delta\mu_\delta$, of its reference stars is given, and on the fourth line the relative proper motion of the variable. The sum of these two values gives the absolute proper motion for each variable in the catalogue.

III Intercomparison of McCormick and Yale motions.

Table I contains the material used and the results obtained in the comparison of the absolute proper motions for the 22 stars common to both the McCormick and the Yale plates.

The resulting means are $\Delta\mu_\alpha = +0''.001 \pm 0''.002$, $\Delta\mu_\delta = -0''.002 \pm 0''.001$. We decided to apply no corrections to the Yale motions to reduce them to the McCormick system because the systematic difference found was caused by a few relatively large values in a small sample.

IV Secular Parallaxes of Variables.

For further discussion the material is divided into 9 groups: eight depending on the period of light variation and the ninth — the Mira-type Carbon stars. The grouping is shown in Table II, and in more detail in Table VI. This division, though purely mechanical, has been chosen to make a convenient comparison with the results obtained by other researchers. However, the space velocities of individual stars are given in Table VI so that any other desired grouping is possible.

Secular parallaxes were derived by two methods.

1) Secular parallax from standard equations

$$P_\alpha \times h/r = \mu_\alpha, \quad P_\delta \times h/r = \mu_\delta$$

where μ_α and μ_δ are the derived absolute proper motions and h/r is the secular parallax; P_α , P_δ are parallax factors in α and δ , computed for the solar apex $A = 285^\circ$, $D = +46^\circ$ (as derived for the Mira variables by Wilson and Merrill, 1942) by the formulae:

$$\begin{aligned}P_\alpha &= \cos 40^\circ (\alpha - 285^\circ) \\ P_\delta &= -\sin 40^\circ \cos\delta + \cos 40^\circ \sin\delta \cos(\alpha - 285^\circ)\end{aligned}$$

The proper motions have not been reduced to

TABLE I
COMPARISON OF ABSOLUTE PROPER MOTIONS OF MIRA-VARIABLES
DERIVED FROM MCCORMICK AND YALE PLATES

Star	x coordinate				y coordinate			
	McC	Yale	Δ_x	v_x	McC	Yale	Δ_y	v_y
				Unit = 0.001				
U Cet	+18	+12	- 6	+ 7.3	-14	-16	- 2	- 0.1
X Hya	-58	-43	+15	-13.7	- 2	- 7	- 5	+ 2.9
R Hya	-50	-31	+19	-17.7	- 4	+ 3	+ 7	- 9.1
T Cen	-26	-21	+ 5	- 3.7	+11	+ 5	- 6	+ 3.9
RT Lib	- 4	- 5	- 1	+ 2.3	- 8	0	+ 8	-10.1
RS Lib	+29	+36	+ 7	- 5.7	-11	-14	- 3	+ 0.9
R Lib	+23	+14	- 9	+10.3	+ 6	+ 2	- 4	+ 1.9
RR Lib	+11	+ 9	- 2	+ 3.3	- 2	-10	- 8	+ 5.9
RZ Sco	- 6	-15	- 9	+10.3	-25	-19	+ 6	- 8.1
S Sco	- 5	- 2	+ 3	- 1.7	- 5	+ 2	+ 7	- 9.1
R Sco	+ 7	+ 4	- 3	+ 4.3	+ 1	- 3	- 4	+ 1.9
V Oph	+18	+ 8	-10	+11.3	+ 4	+ 1	- 3	+ 0.9
RR Oph	+ 4	- 5	- 9	+10.3	-10	- 9	+ 1	- 3.1
R Oph	-23	-32	- 9	+10.3	-10	-24	-14	+11.9
RW Sgr	- 6	-16	-10	+11.3	- 2	- 4	- 2	- 0.1
RX Sgr	-13	- 2	+11	- 9.7	+16	+ 6	-10	+ 7.9
R Sgr	+12	+10	- 2	+ 3.3	-11	-10	+ 1	- 3.1
R Del	- 6	+ 1	+ 7	- 5.7	- 8	-10	- 2	- 0.1
Z Cap	- 3	0	+ 3	- 1.7	- 9	- 8	+ 1	- 3.1
RS Aqr	+ 2	+ 6	+ 4	- 2.7	+ 2	- 5	- 7	+ 4.9
RR Aqr	+ 6	+21	+15	-13.7	-15	-13	+ 2	- 4.1
W Cet	(+ 4)	+14	+10	- 8.7	(+ 7)	- 2	- 9	+ 6.9
	[vv] = 1728.78				[vv] = 721.82			
	μ = ± 0.0091				μ = ± 0.0059			
	r = ± 0.006				r = ± 0.004			

Mean difference $\bar{\Delta}_x = +0.0013 \pm 0.002$
 $v_x = \bar{\Delta}_x - \Delta_x$

$\bar{\Delta}_y = -0.0021 \pm 0.001$
 $v_y = \bar{\Delta}_y - \Delta_y$

Δ_x and Δ_y are in the sense Yale minus McCormick
 μ is the mean square error of one difference
 r is the probable error of one difference

the motion of stars at any standard distance since such a reduction would create a systematic error due to the unknown but considerable interstellar absorption near the galactic plane. This absorption affects the stars beyond this standard distance much more than those which are nearer than this distance.

For each group of variables the secular parallaxes, h/r , computed separately from μ_x and μ_y , and

their means are given in Table II (columns 6-8). They were converted to mean annual parallaxes using the relation

$$\bar{\pi}_s = \frac{h}{r} \times \frac{4.737}{V}$$

where h/r has been taken from column 8 and V from column 5 in Table II.

TABLE II
MEAN PARALLAXES: SECULAR AND ANNUAL, AND MEAN DISTANCE OF THE GROUPS

Grp	No. of Stars	Range of Period	Mean Period $\bar{P}$	V_0 km/sec	From standard equations		From τ -components		$\frac{\bar{\pi}_0 + \bar{\pi}_1}{2}$	Dist pc
					$h/r \pm p.e.$ from α	$h/r \pm p.e.$ from δ	Mean annual $\bar{\pi}_0$	θ km/sec	Mean annual $\bar{\pi}_1$	
					'0001	'0001	'0001	'0001	'0001	
1	14	91-149	131.2	54	+216 $\pm$ 47	+118 $\pm$ 40	+153 $\pm$ 31	+13.4 $\pm$ 3	+12.3 $\pm$ 2	+13 $\pm$ 2
2	29	150-199	175.9	104	+140 29	+156 25	+164 18	+7.5 2	+7.7 1	8 1
3	55	200-249	223.3	60	+197 27	+66 18	+74 16	+5.8 1	+10.2 1	8 1
4	65	250-299	272.7	50	+60 18	+90 15	+83 12	+7.9 1	+9.9 1	9 1
5	73	300-349	323.9	36	+168 20	+123 16	+152 13	+18.9 2	+13.1 1	16 1
6	42	350-399	376.0	31	+130 33	+86 27	+110 21	+16.8 4	+18.9 2	18 2
7	25	400-449	418.3	28	+134 25	+116 36	+150 22	+25.4 4	+25.2 2	25 2
8	18	450-612	508.2	22	+143 29	+74 21	+80 18	+17.2 3	+11.6 1	14 2
C	26	252-590	404.2	29	+73	+72	+73	+11.9 1	+17.0 1	14 1
Sc	22	226-612	363.6	20	+21	+92	+56	+13.3 1	+13.8 2	13 1
										740

All but two column headings are self-explanatory. V_0 is the group motion adopted from Table 8 by Wilson and Merrill (1942) and adjusted to our periods where needed.

θ is the average linear peculiar motion in the direction of τ -component, adopted from Table 8 by Wilson and Merrill (1942).

In the first column, C stands for Carbon stars and Sc for S-stars. The latter in general have not been treated as a separate group. In most of the computations they are mixed in with the groups 1-8 depending on their periods. They have been singled out for getting an idea of their distance, absolute magnitude and space velocity.

2) Mean Parallaxes from τ -components
 τ -components were computed with the usual formulae:

$$\begin{aligned}\cos \lambda &= \sin D \sin \delta + \cos D \cos \delta \cos (\alpha - A) \\ -\sin \lambda \cos \chi &= \sin D \cos \delta - \cos D \sin \delta \cos (\alpha - A)\end{aligned}$$

where (A, D) are coordinates of the solar apex with respect to the Mira stars, $A = 285^\circ = 19h$ and $D = +40^\circ$.

λ = the angular distance between the solar apex and the star

χ = the position angle of the antapex.

Also $\bar{\tau}^2 = \bar{\tau}^2 - \eta^2$

$\bar{\tau}$ = mean τ -component for a subgroup

$$\bar{\tau} = \mu_a \cos \delta \cos \chi - \mu_s \sin \chi$$

η includes the measuring errors of both the variable star and the reference stars as well as the cosmic dispersions of the reference stars, i.e.

$$\eta^2 = \eta_1^2 + \eta_2^2; \eta_1 = \frac{|\bar{d}|}{\sqrt{2}}; \eta_2 = \bar{\sigma}/0.845$$

$$|\bar{d}| = \frac{|\dot{d}_a| + |\dot{d}_s|}{2}$$

$$|\dot{d}_a| = |\mu_{a2} - \mu_{a1}|$$

$$|\dot{d}_s| = |\mu_{s2} - \mu_{s1}|$$

$\bar{\sigma}$ is cosmic error depending on galactic latitude.

The values of σ for given latitude and the number of reference stars, N , are as follows:

$$\begin{array}{lll} b^l: & 0^\circ - 20^\circ & 21^\circ - 40^\circ & 41^\circ - 90^\circ \\ \bar{\sigma}: & 0''.0044/\sqrt{N} & 0''.0090/\sqrt{N} & 0''.0140/\sqrt{N} \end{array}$$

To convert the τ -components into mean parallaxes, we use the relation

$$\bar{\pi}_\tau = \frac{4.737}{\bar{\tau}}$$

Where θ , from Table II, column 10, is the average linear peculiar motion in the direction of the τ -component as derived by Wilson and Merrill (1942) and adjusted for our mean periods.

V Absorption and Absolute Magnitudes

Having found the mean distances for the groups, the mean interstellar absorption had to be derived. In spite of a vast number of papers published on this subject (see a list of 1039 titles by Kharadze, 1952), we have not been able to find any values of the absorption based on observations which would fit our needs in so many regions. The best applicable values are those in Table XLVIII by Kharadze (1952), but the area covered by his

observations is rather small. So, we have decided to use Parenago's (1945) theoretical formula

$$A(r, b^l) = \frac{a_0 \beta}{\sin b^l} \left(1 - e^{-\frac{r \sin b^l}{\beta}}\right)$$

where A = absorption in blue (photographic) light

a_0 = a constant, absorption per kiloparsec

β = 100 pc

r = average distance of the obscured star as given in Table II

b^l = galactic latitude of the star, on the old system

For the computations the numerical values of a_0 and their distribution have been taken as they appear on Parenago's (1945) chart. In regions for which an observed value of the a_0 from Kharadze's work is available, a mean of the theoretical and observational values of a_0 has been adopted. Kharadze's observational results are in satisfactory agreement with Parenago's theoretical values.

The derived absorptions, A , are for blue light. They can be converted to visual absorption using the relation $A_{vib} = 0.75A_{pb}$ as outlined in the Smithsonian Physical Tables, 9th ed. (1954).

Since almost all of our computed values of the absorption are based on extrapolated or even theoretical numerical values of a_0 (absorption per kiloparsec) it is desirable to compare our results with actual observations. Fortunately a paper by Gascoigne and Eggen (1957) provides us with such material. They have used photoelectric magnitudes and colors of 55 cepheids over all longitudes near the galactic plane, at mean galactic latitude, $b^l = -3^\circ$. We have computed in the same way as for our Mira variables the absorption for the 55 cepheid variables in their Table II. The comparison of our computed value with that given by them is as follows: (Gasc. + Eggen) — McC = $\Delta A_{vib} = -0.19$ mag. This result is tolerable, especially if we consider the heavy and inhomogeneous absorption near the galactic plane. It seems fairly safe to say that at increased latitudes, the systematic difference should decrease, and so we have used our computed values of the absorption without any correction.

Our next problem was to decide on the magnitudes to correct for the absorption. Since the maximum magnitudes of the Mira variables may fluctuate by as much as 2 mags, the proper ones to use are the mean maximum magnitudes. There was only one source (Campbell, 1955) available at the time we started the computations. Soon afterwards, however, the 2nd edition of the General Catalogue

of Variable Stars (1958) was published. There are about 30 variables for which no mean maximum magnitude was available. For these stars various sources, given in *Geschichte und Literatur des Lichtwechsels der Veränderlichen Sterne* (1934-1960), were consulted and all available maxima were used for a mean maximum magnitude. For several stars only blue magnitudes were available. A statistical procedure was used to reduce them to visual magnitudes: some 50 variables whose blue $m_{\max}$ are given at various places in *Harvard Annals* (1952) were compared with their visual $m_{\max}$ from other sources. The mean color index is $+1.29$ mag., so 1.3 mag. was used to reduce all blue magnitudes to visual.

A comparison of the mean magnitudes given in the GCVS with those given by Campbell revealed an average systematic difference of 0.13 mag., Campbell's magnitudes being fainter, i.e. $\Delta m = \text{G.C.V.S.} - \text{Campbell} = -0.13$ mag. The number of stars used in this comparison and the differences for the groups are given in Table III.

Campbell's magnitudes are based on the Harvard visual system while, according to a letter from Prof. B. V. Kukarkin, the first author of the *General Catalogue of Variable Stars*, "information about the mean maximum magnitudes for Mira Ceti type stars given in G.C.V.S. is based on all published data, while maximum magnitudes in Campbell's study of Long-period Variables, 1955, pp. 235-241 are based only on AAVSO observations. This possibly may be the reason for the small systematic difference."

In our computations we have used the mean maximum magnitudes from G.C.V.S. For 77% of our variables the magnitudes are given, for the rest they were derived using corrections from Table III

TABLE III
SYSTEMATIC DIFFERENCE IN MAGNITUDES
GCVS - CAMPBELL

Grp	No. of stars in grp	No. of stars comp.	GC-Cpb. $m_{\max}$
1	14	6	-0.08
2	29	18	-0.17
3	55	41	-0.14
4	65	52	-0.10
5	73	62	-0.11
6	42	37	-0.10
7	23	22	-0.18
8	18	16	-0.22
C	26	19	-0.14
weighted mean			-0.13

to Campbell's magnitudes. These individual magnitudes were corrected for the absorption derived above to obtain the final mean maximum magnitudes. These magnitudes were used to form the mean maximum of each group which combined with the distances already found for the groups gave the mean absolute magnitude for the groups. These values are shown in Table IV.

Table IV summarizes the results obtained from combining the group motions V_{∞} , the average linear peculiar motions, (for computation of distance), as given by Wilson and Merrill (1942) and the proper motions derived at McCormick Observatory. It also gives the periods, apparent mean maximum magnitudes and the spectra at maxima as given in the *General Catalogue of Variable Stars*

TABLE IV
MEAN DISTANCES AND ABSOLUTE MAGNITUDES OF MIRA VARIABLES

Grp	No. of Stars	$\bar{P}$	$\bar{m}$ max.	$\bar{r}$ pc	$\bar{M}_{\max}$	$\bar{S}_p$	$\Delta \bar{M}$ (TiO)	$\bar{M}$ corr.
1	14	131	7.76	770	-1.67	M1.9	+0.27	-1.94
2	29	176	7.83	1300	-2.74	M2.7	+0.42	-3.16
3	55	223	8.38	1250	-2.10	M3.7	+0.70	-2.80
4	65	273	8.18	1100	-2.03	M4.2	+0.87	-2.90
5	73	324	8.05	625	-0.93	M5.3	+1.32	-2.25
6	42	376	7.69	560	-1.05	M6.2	+1.8	-2.85
7	23	419	7.70	400	-0.31	M5.5	+2.0	-2.31
8	18	508	8.06	700	-1.17	M6.0	+1.65	-2.82
C	26	404	7.75	700	-1.44			
Se	22	364	7.78	740	-1.57			

(1958), and the correction for TiO absorption by Gabovits (1936).

Although this correction for TiO cannot account

for all the scattering in $\bar{M}$, it definitely brings the mean absolute magnitude ($\bar{M}_{vib} = -2.70$) for the variables, with periods less than 300 days, practically in agreement with $\bar{M}_{vib} = -2.56$ for the variables with $P > 300$ days. While the qualitative character of the TiO correction looks quite real, the numerical values are based on only 3 stars for every spectral subclass (see Table I, Gabovits, 1936). The probable error of our absolute magnitudes is estimated to be ± 0.5 mag.

For the convenience of the reader we insert Table V which gives the absolute magnitudes derived or compiled by other authors.

In addition to these more extensive investigations, there are two recent papers dealing with the absolute magnitudes of variable Carbon stars and one with Mira type S stars. K. Ishida (1960) has found $\bar{M}_v = -2.5 \pm 0.7$ (p.e.) for 32 Mira type Carbon stars, which is a magnitude brighter than our value of -1.44 . Apparently there are three reasons for this discrepancy. His mean maximum magnitude is 7.85, ours is 8.6; his mean distance is 1.02 kpc, but ours is 0.7 kpc, which means a difference in magnitude of 0.9; his correction for absorption is 0.36 mag. while ours is 0.85 mag. These three differences add up exactly to -1.1 mag.

In his investigation of R stars, G. L. Vandervort (1958) has found that 15 variables of this type have $\bar{M}_v = -1.18$. However, most of his variables are of the irregular type and therefore are not directly comparable with our carbon variables.

W. Takayanagi (1960) has found $\bar{M}_v = -3.0 \pm 0.5$ (m.e.) for 26 Mira type S-stars which is about 1.5 mag. brighter than our value of -1.57 . His mean distance, $\bar{r}$, is 1.18 kpc, $\bar{m}_v$ (maximum) is 7.5, and mean absorption 0.4 mag. Our corresponding values are 0.74 kpc, 8.55 mag. and 0.8 mag. Here the differences add up to -1.6 mag. Concerning Takayanagi's Table 4 we would like to call attention to the fact that Keenan's (1954) $\bar{M}_v$ for S-type stars of the Mira class derived from proper motions and radial velocities is -1.0 .

Although Feast (1953) investigated only one irregular S-type star, π^1 Gruis, we would like to mention that he found M to be between -1.0 and 0 .

VI Space velocities.

The space velocities could be derived in two ways: 1) either by use of the mean radial velocity, proper motion and parallax, or 2) by use of individual values of these observations for every star. In order to enable any desirable future regrouping, we have chosen the second method.

The usual equations for the velocity components in the heliocentric equatorial coordinate system are:

TABLE V
ABSOLUTE MAGNITUDES OF MIRA VARIABLES — OTHER AUTHORS

Kukarkin's revision				Safronov			Miczaika				
of				No. of Stars	ΔM (TiO)	M_{vib} corr	P	M_{vib}	Sp	ΔM (TiO)	M_{vib} corr
Wilson & Merrill											
P	$\bar{M}_{vib}$	P	M_{vib}	P	M_{vib}	ΔM (TiO)	P	M_{vib}	Sp	ΔM (TiO)	M_{vib} corr
300	-0.7	225	-2.4	450	-0.4						
350	-0.2	250	-2.1	500	-0.2						
400	+0.3	275	-1.8	550	-0.1						
450	+0.6	300	-1.5	600	0						

$$\begin{aligned}\dot{x}_e &= R_p \cos \alpha \cos \delta - T_p \cos \delta \sin \delta - T_a \sin \delta \\ \dot{y}_e &= R_p \sin \alpha \cos \delta - T_p \sin \alpha \sin \delta + T_a \cos \delta \\ \dot{z}_e &= R_p \sin \delta + T_p \cos \delta\end{aligned}$$

with the space velocity

$$W = \sqrt{\dot{x}_e^2 + \dot{y}_e^2 + \dot{z}_e^2}$$

Here $R_p = R - \rho$ is the radial velocity of the star, corrected for galactic rotation, $\rho = \text{Arcos}^2 b^1 \times \sin 2(1^1 - 1^1_0)$. A is the coefficient of galactic rotation. We adopted the value of A to be 18 km/sec/kpc based on the recent results by Petrie, Cuttle and Andr. vs (1956), Stibbs (1956), Gascoigne and Eggen (1957), Thackeray (1958), Edmondson (1956) as compiled and discussed by Edmondson (1959).

$$r = \frac{1}{\pi} \text{ for each individual star}$$

$$\begin{aligned}T_a &= \frac{4.737}{\pi} \mu_a, \text{ where } \mu_a, \mu_b \text{ are the absolute proper motions at } \pi \text{ is the stellar parallax, computed from the equation } M = m' + 5 + 5 \log \pi \\ T_b &= \frac{4.737}{\pi} \mu_b\end{aligned}$$

M is the mean absolute magnitude from Table IV, Column 6 for the group to which the star belongs and m' is the mean maximum visual magnitude of the star corrected for interstellar absorption. Having found R_p and T_a , T_b the space velocity W was obtained from the expression:

$$W = \sqrt{T_a^2 + T_b^2 + R_p^2}$$

However we were more interested in the distribution of the velocity vector points on the planes of the galactic coordinate system than in the individual values of these velocities. Therefore our W derived from the two foregoing expressions, served as a check, and $\dot{x}_e$, $\dot{y}_e$, $\dot{z}_e$ were used to compute the components of the space velocity in the galactic coordinate system, using equations:

$$\begin{aligned}\dot{x}_e &= W \cos A \cos D \\ \dot{y}_e &= W \sin A \cos D \\ \dot{z}_e &= W \sin D\end{aligned}$$

where $A = \text{R.A., } D = \text{Decl. of apex of the star's velocity}$
and $W = \sqrt{\dot{x}_e^2 + \dot{y}_e^2 + \dot{z}_e^2}$

The equatorial coordinates A , D found from $\tan A = \frac{\dot{y}_e}{\dot{x}_e}$ and $\sin D = \frac{\dot{z}_e}{W}$ were converted into galactic

coordinates l^1 , b^1 by means of Ohlsson's tables (1932). We retained Ohlsson's galactic pole but oriented our positive x_e axis toward longitude 58° , so we used $l^1_1 = l^1 - 58^\circ$ and the following equations for computing $\dot{x}_e$, $\dot{y}_e$, $\dot{z}_e$:

$$\begin{aligned}\dot{x}_e &= W \cos l^1_1 \cos b^1 \\ \dot{y}_e &= W \sin l^1_1 \cos b^1 \\ \dot{z}_e &= W \sin b^1\end{aligned}$$

Thus far the velocity components $\dot{x}_e$, $\dot{y}_e$, $\dot{z}_e$ are referred to the sun's motion as origin. However, the sun deviates from circular velocity around the galactic center (Vyssotsky and Janssen, 1951), so we added the components of Basic solar motion (Dyer, 1956) to obtain the velocity components, referred to circular velocity around the galactic center:

$$a = \dot{y}_e - 9.8 \text{ (away from the galactic center, toward } l^1 = 148^\circ)$$

$$b = \dot{x}_e + 10.2 \text{ (in the direction of galactic rotation, i.e., toward } l^1 = 58^\circ)$$

$$c = \dot{z}_e + 5.9 \text{ (toward the galactic North Pole).}$$

Figures 3, 4, 5 display the distribution of the space velocity vector points. The captions explain the arrangement of the groups and the planes on which these points are projected.

The numerical values of W , a , b , c along with other information for every star are given in Table VI. Because the velocities of individual stars have been determined statistically, we were more interested in the mean values of the velocities, $\bar{a}$, $\bar{b}$, $\bar{c}$. They are given in Table VII together with the comparison of the results of other researchers.

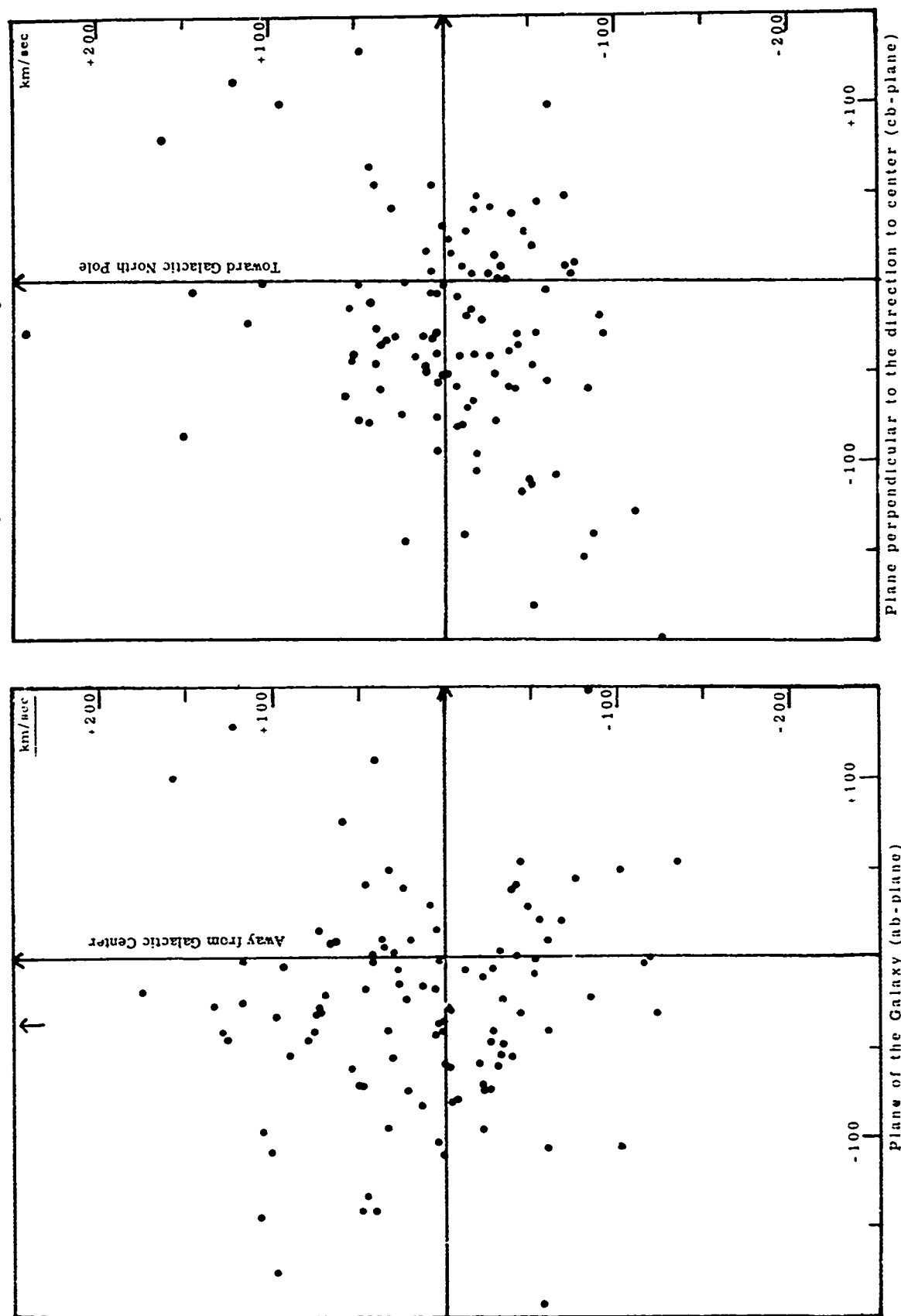
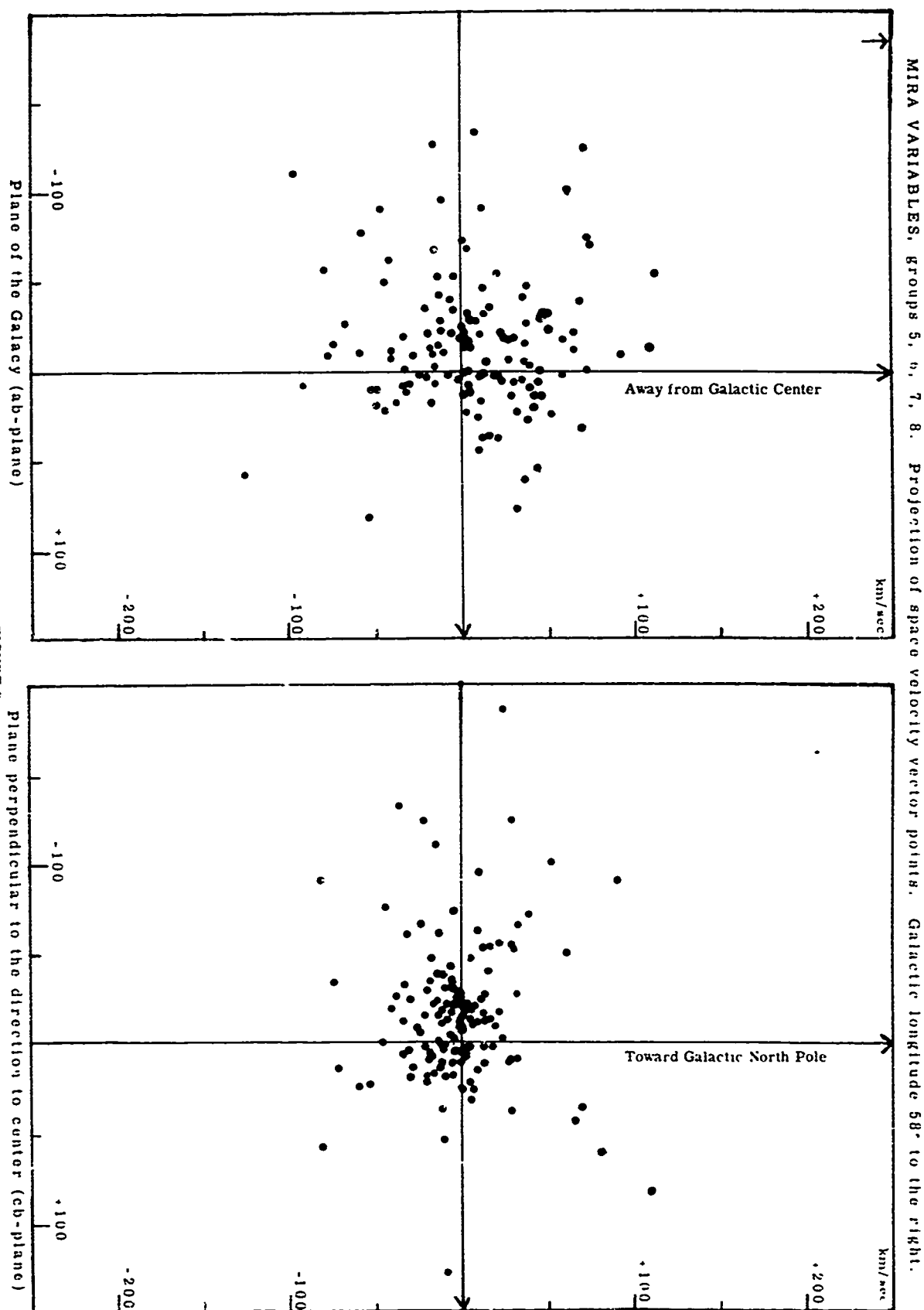
MIRA VARIABLES, groups 1, 3, 4. Projection of space velocity vector points. Galactic longitude 58° to the right

FIGURE 2



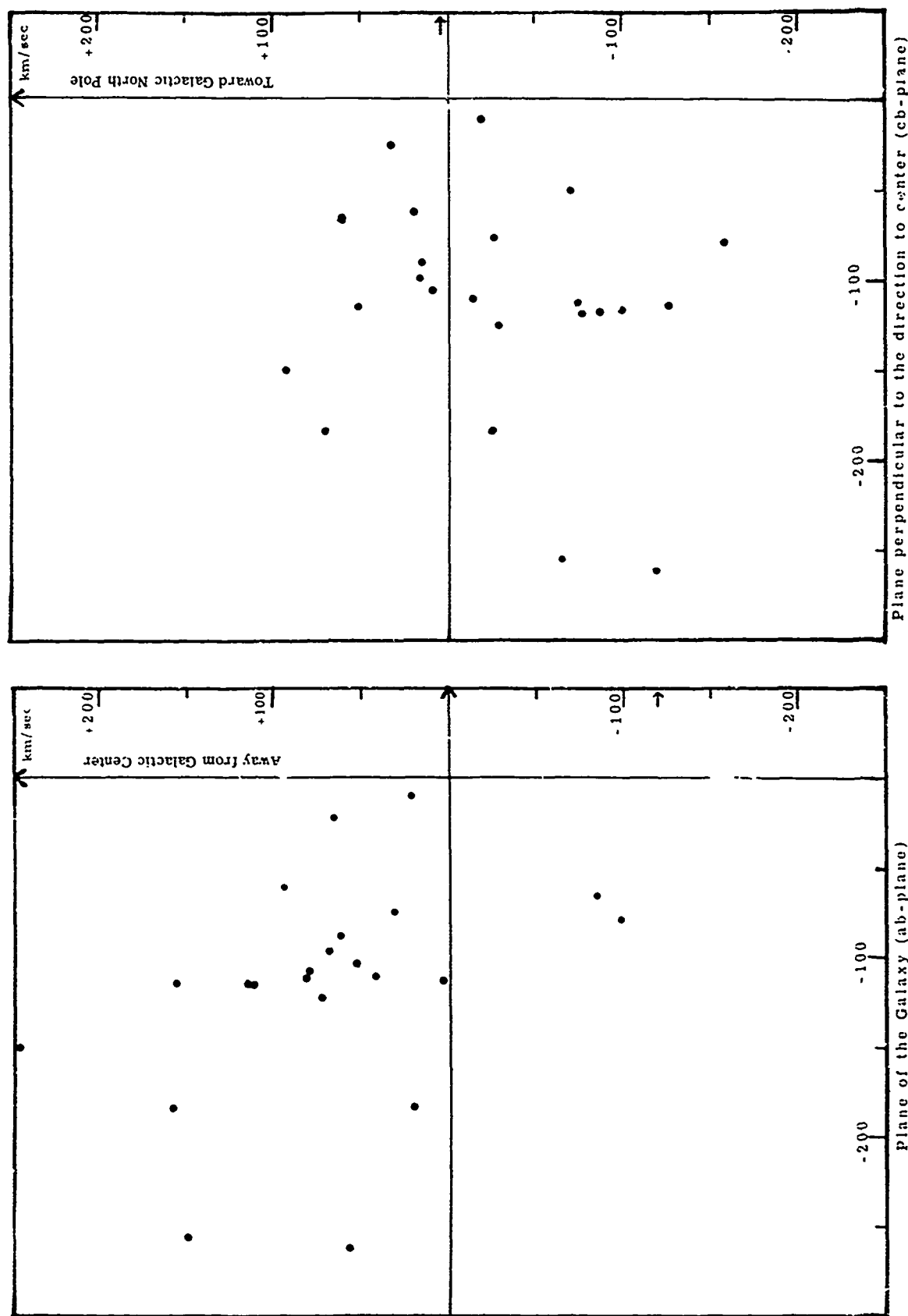
MIRA VARIABLES, group 2. Projection of space velocity vector points. Galactic longitude 58° to the right.

FIGURE 4

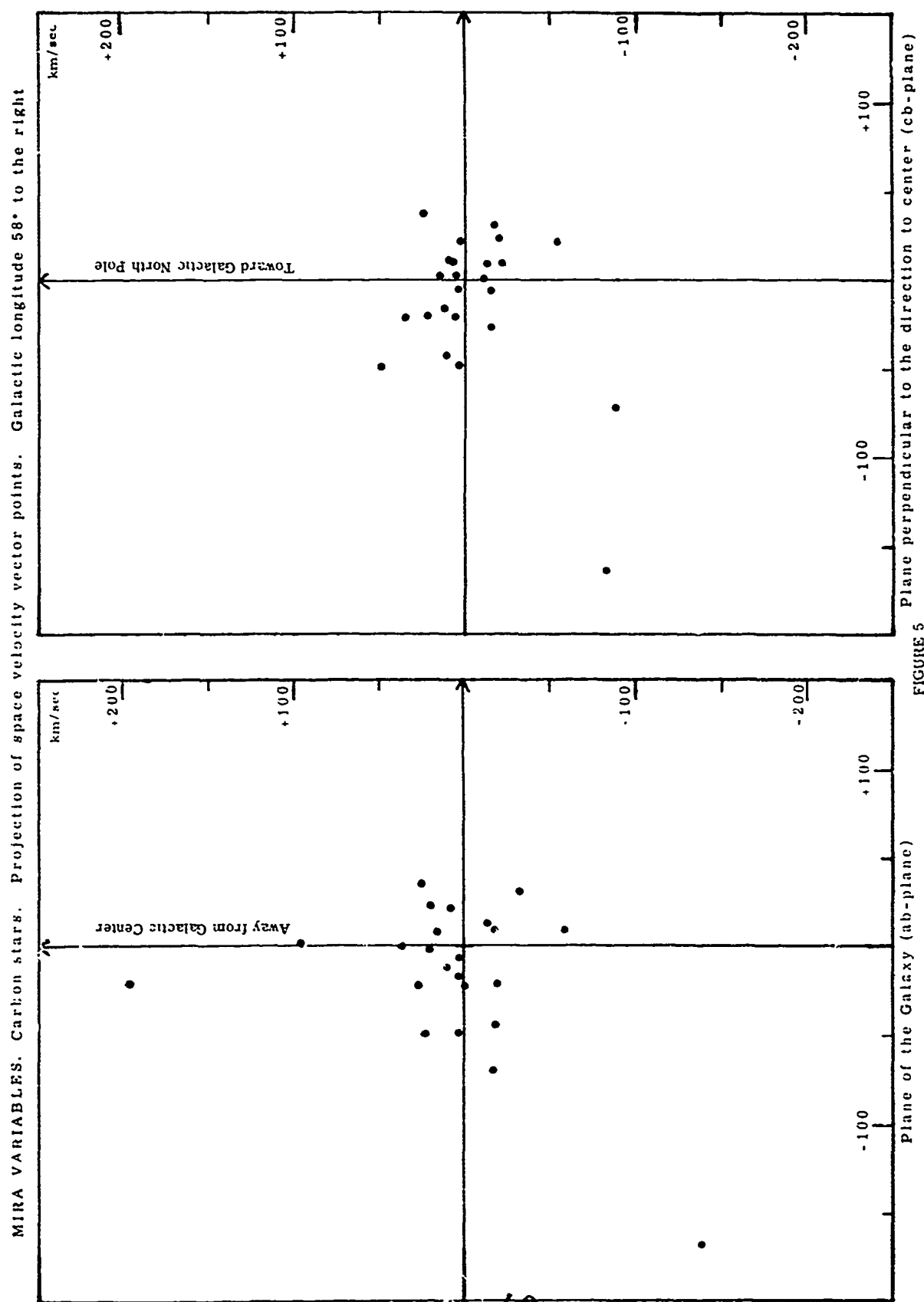


FIGURE 5

TABLE VI

MAGNITUDE, RADIAL VELOCITY, TANGENTIAL VELOCITY, AND SPACE VELOCITY OF MIRA VARIABLES

(Explanation of Column Headings Follows this Table)

Star	Desig.	m	m'	R	R _p	T _α	T _δ	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 1 $91^d \leq P \leq 149^d$														
X Cam	043375	8.1	6.8	0	+ 8	- 21	- 45	50.2	+ 36.4	+ 34.4	- 4.0	+ 9.1	+ 22.2	- 32.8
W Pup	074342	8.4	7.1	+ 17	+ 13	+ 42	+ 5	44.2	- 43.4	- 6.5	- 5.0	- 11.7	- 21.9	+ 42.1
R Vir	123307	6.9	6.7	- 25	- 24	- 81	+ 11	85.2	+ 13.2	+ 83.8	+ 7.8	- 15.4	+ 69.1	- 14.5
T Cen	133633	6.1	5.8	+ 28	+ 32	- 36	+ 12	49.7	- 45.2	+ 19.3	- 7.4	- 25.7	- 0.8	+ 38.7
SS Her	162807	9.2	8.5	- 46	- 55	0	- 9	55.8	+ 20.9	+ 49.3	- 15.7	- 13.7	+ 28.4	- 27.0
SY Her	165723	8.0	7.2	+ 13	+ 5	+ 56	- 31	64.2	+ 49.5	- 31.0	- 26.7	+ 28.4	- 45.4	- 44.8
S Aql	200715	9.4	8.3	-113	-129	+ 28	+ 81	154.6	- 52.9	+138.5	+ 44.0	- 45.3	+127.4	+ 50.7
Z Aql	201006	9.6	8.6	- 6	- 22	+ 53	+ 5	57.7	+ 33.3	+ 46.5	+ 7.5	+ 11.0	+ 37.2	- 27.0
R Vul	210023	8.1	7.3	- 12	- 19	- 3	+ 15	24.4	- 18.6	+ 14.5	+ 6.2	- 0.9	+ 4.4	+ 22.7
AM Peg	210512	9.2	8.4	....	....	+ 57	- 33	.....						
RW Aqr	211800	9.5	9.0	....	....	+ 14	- 34	.....						
T Gru	222038	8.6	8.1	+ 1	0	+ 9	-108	108.4	- 56.6	+ 36.4	- 85.0	- 97.0	- 23.0	+ 9.2
RY Cep	231878	9.5	8.1	....	....	+ 43	+ 73	.....						
Z Aqr	234716	8.6	8.4	+ 68	+ 67	+133	-123	193.2	+ 36.8	+131.1	-137.0	-134.4	+ 45.7	-110.0
GROUP 2 $150^d \leq P \leq 199^d$														
TT Peg	000127	9.0	9.0	- 33	- 12	+178	- 83	196.8	+ 25.3	+178.1	- 79.7	-115.9	+116.3	- 77.3
Z Cet	010102	8.9	8.5	+ 3	- 3	-142	+ 16	143.0	+ 35.4	-137.6	+ 16.1	+102.1	-119.3	+ 3.4
U Psc	011712	11.0	10.5	....	....	+142	- 24	.....						
R Ari	021025	8.1	7.6	+114	+127	+121	- 60	185.4	+ 54.2	+178.3	- 4.5	- 48.0	+150.2	- 69.9
R Cet	022101	8.1	7.1	+ 42	+ 39	+ 71	- 59	100.2	- 9.6	+ 80.1	- 59.4	- 74.9	+ 31.7	- 26.7
X Cet	031401	8.8	8.3	+ 59	+ 57	- 79	-182	206.4	+ 93.9	- 12.9	-183.4	- 77.6	- 97.6	-158.9
V Tau	044617	9.2	7.3	+ 78	+ 77	+ 85	- 66	132.4	- 51.3	+115.3	- 40.0	- 96.7	+ 67.8	+ 15.1
RS Aur	055646	9.5	8.5	+ 17	+ 30	- 63	-190	202.5	+ 65.4	+157.2	-109.6	-111.8	+ 82.2	- 27.0
X Aur	060450	8.6	7.6	- 18	- 8	- 16	-153	154.1	+ 13.8	+112.9	-104.0	-111.4	+ 41.8	- 73.5
X Mon	065209	7.5	5.8	+160	+151	- 7	- 55	160.0	- 25.1	+138.6	- 77.7	-122.8	+ 73.3	- 30.3
S Car	100661	5.6	3.6	+289	+291	- 83	+ 52	306.9	- 15.9	+203.3	-229.4	-261.9	+ 58.0	-118.9
S Leo	110606	10.1	9.8	+106	+ 97	-221	- 95	259.5	- 51.6	+239.9	- 84.3	-184.2	+159.2	- 25.7
RS Cen	111661	8.6	6.6	....	....	- 3	- 14	.....						
V CVn	131546	6.8	6.6	- 2	- 1	-146	-146	206.5	-145.9	+104.5	-102.0	-183.8	+ 20.9	+ 69.7
RR Boo	144340	8.7	8.4	- 44	- 49	-111	- 8	121.6	- 48.0	+105.3	- 37.5	- 87.9	+ 61.5	+ 14.4
S Lib	151620	8.4	7.6	+294	+295	- 26	-105	314.2	-178.0	-164.6	-199.8	-149.8	+246.3	+ 92.5
RZ Sco	155924	8.8	8.0	-174	-167	- 68	-149	234.0	+ 48.9	+218.2	- 68.6	-115.3	+156.7	-100.3
S Sco	161223	10.5	9.7	+ 85	+ 57	- 63	- 32	119.9	- 91.2	- 39.9	- 66.8	- 65.3	- 85.3	+ 60.3
SS Oph	165303	8.7	7.1	- 34	- 42	+ 4	- 13	44.2	+ 16.2	+ 39.6	- 11.1	- 7.9	+ 21.5	- 19.5
T Her	180531	8.0	7.5	-122	-138	- 11	+ 58	150.1	- 14.5	+147.9	- 21.4	-108.5	+ 79.6	- 15.0
W Lyr	181237	7.9	7.4	-174	-188	+ 42	+ 47	198.2	+ 33.1	+180.7	- 74.5	-115.7	+111.8	- 87.2
RY Oph	181204	8.2	6.7	- 65	- 77	- 26	+ 29	86.4	- 30.0	+ 77.4	+ 24.0	- 22.1	+ 65.2	+ 31.2
RW Sgr	190819	9.3	8.3	....	....	-126	- 32	.....						
RT Cyg	194149	7.3	5.7	-116	-118	0	+ 52	129.0	- 49.9	+106.0	- 54.0	-102.6	+ 52.7	+ 8.2
RU Vul	203523	9.1	8.3	- 86	-107	+ 47	+ 47	125.8	- 36.2	+120.5	+ 1.7	- 59.8	+ 93.9	+ 19.0
Z Cap	210517	9.5	9.0	- 64	- 89	- 24	- 95	132.3	- 97.9	+ 60.2	- 65.6	-113.4	+ 3.2	+ 51.1
RR Aqr	211003	9.7	9.2	-182	-213	+166	-166	317.1	- 51.5	+272.8	-153.3	-254.7	+149.3	- 65.4
SS Aqr	221415	8.8	8.4	....	....	- 24	-269	.....						
AK Peg	225811	8.8	8.3	....	....	+126	+ 16	.....						

TABLE VI (continued)

Star	Desig.	m	m'	R	R _p	T _α	T _δ	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 3 $200^d \leq P \leq 249^d$														
S Tuc	001862	9.3	9.0	....	....	0	+ 8	.....						
YZ And	002230	10.0	9.4	....	....	+133	- 95	.....						
RU And	013338	10.4	9.8	- 43	- 5	- 47	+ 47	66.6	- 11.9	- 56.2	+ 33.8	+ 54.2	- 44.2	+ 42.2
Y And	013439	9.1	8.5	- 7	+ 12	- 30	- 77	83.5	+ 64.6	- 4.5	- 52.5	+ 3.9	- 30.5	- 74.8
S Tri	022132	9.1	8.5	....	....	- 24	- 47	.....						
U Cet	022914	7.5	7.2	- 27	- 28	+ 51	- 51	77.4	- 62.1	+ 16.9	- 43.0	- 59.6	- 20.9	+ 37.4
T Hor	025851	8.2	7.9	....	....	+ 71	+ 81	.....						
R Per	032435	8.7	6.8	- 78	- 72	- 31	- 39	87.5	+ 1.2	- 47.7	- 73.4	- 22.1	- 85.9	- 22.6
T Col	051634	7.5	7.2	+ 67	+ 58	+ 88	+ 37	111.6	- 73.0	+ 84.4	- 1.6	- 63.7	+ 56.7	+ 56.6
Y Mon	065111	9.1	7.8	+ 71	+ 58	- 9	- 81	100.0	- 7.4	+ 73.0	- 68.0	- 77.6	+ 22.1	- 22.9
ST Gem	073335	9.1	8.7	....	....	-129	-169	.....						
X UMa	083450	9.7	9.3	- 83	- 74	- 66	-161	189.1	+ 3.8	+101.5	-159.5	-153.0	+ 4.5	- 88.7
S Pyx	090125	9.0	8.3	+100	+ 88	+ 30	- 6	93.2	- 76.1	+ 33.3	- 42.3	- 72.5	- 2.6	+ 48.2
RS Leo	093820	10.4	10.1	....	....	-114	+104	.....						
S LMi	094835	8.6	8.2	- 2	- 4	+ 42	+ 26	49.6	- 7.6	- 45.2	+ 18.9	+ 40.9	- 41.6	+ 28.4
W Cen	115059	8.5	6.2	....	....	- 78	+ 6	.....						
SU Vir	120013	9.4	9.2	+ 22	+ 22	-142	+ 66	158.2	- 6.7	+12.0	+ 69.3	- 6.2	+146.6	+ 22.4
Y Vir	122904	9.4	9.0	+ 9	+ 16	-190	-119	224.8	- 31.7	+187.5	-119.9	-179.7	+ 95.5	- 52.3
S UMa*	124062	7.8	7.5	+ 8	+ 12	- 40	+ 16	44.7	+ 1.4	+ 40.8	+ 18.2	+ 6.3	+ 34.7	+ 6.7
U Vir	124606	6.2	8.0	- 46	- 44	- 47	+ 5	64.6	- 34.0	+ 54.9	+ 0.3	+ 2.0	+ 1.9	- 32.1
R Boo	143327	7.2	6.9	- 58	- 60	- 98	+ 65	132.0	+ 4.7	+128.3	+ 30.5	- 23.9	+117.4	- 3.3
U Boo	145018	10.4	10.1	+ 19	+ 11	- 71	+225	236.4	- 3.8	+ 92.6	+217.4	+128.7	+172.7	- 98.3
RS Lib	151823	7.5	6.7	- 5	0	+ 89	- 33	95.0	- 76.0	- 48.1	- 30.5	+ 44.8	- 75.0	- 53.9
U Lib	153621	9.6	8.8	+ 95	+103	+ 81	+ 14	131.7	+ 6.2	-129.4	- 23.6	+ 53.1	-134.3	+ 8.2
X CrB	154537	9.1	8.9	-104	-115	-111	- 32	163.0	- 51.7	+122.5	- 94.2	-141.1	+ 48.3	- 11.1
R Lup	154736	10.1	9.2	....	....	+ 76	+ 19	.....						
R Lib	154816	10.3	9.5	+ 14	+ 19	+171	+ 38	176.3	+127.8	-117.3	- 31.4	+148.8	- 86.6	- 71.4
U Ser	160210	8.5	8.1	- 31	- 40	- 58	+195	207.3	- 14.2	+ 92.8	+184.8	+ 99.1	+157.4	+ 90.2
X Sco	160321	11.0	9.7	....	....	+ 24	-107	.....						
R Sco	161223	10.4	9.2	0	+ 7	+ 57	- 9	58.1	- 49.4	- 28.5	- 11.0	- 38.5	- 35.3	- 37.9
W CrB	161238	8.5	8.1	+ 20	+ 11	- 58	+ 11	60.1	- 52.5	+ 24.7	- 15.5	- 14.6	+ 14.2	+ 55.1
S Oph	162817	9.5	7.9	- 9	- 9	- 38	- 28	48.0	- 28.5	+ 30.2	- 24.2	- 35.3	+ 2.4	- 15.1
R Dra	163267	7.6	7.2	-133	-131	- 54	+ 58	153.1	- 11.1	+117.2	- 97.8	-121.3	+ 46.0	- 49.0
RV Her	165731	10.1	9.5	- 40	- 63	- 47	0	78.6	- 30.5	+ 64.6	- 32.8	- 57.2	+ 30.7	+ 7.3
RS Her	171823	7.9	7.1	- 41	- 51	- 85	- 17	100.5	- 76.2	+ 55.2	- 35.5	- 78.5	+ 14.0	+ 47.2
RU Oph	172609	9.3	8.5	- 65	- 83	-136	- 24	161.0	-123.8	+ 96.0	- 37.4	- 98.2	+106.5	- 19.3
U Ara	174652	8.4	7.4	....	....	- 29	- 36	.....						
RY Her	175519	9.0	8.2	- 39	- 57	+ 37	- 21	71.2	+ 38.2	+ 60.1	+ 0.8	+ 2.2	+ 47.2	- 36.0
R Pav	180364	8.5	7.7	....	....	- 90	+ 78	.....						
SV Her	182225	9.8	9.3	- 23	- 55	+ 9	- 66	86.4	+ 6.9	+ 22.8	- 83.0	- 59.0	- 28.3	- 42.4
S Sgr	191419	10.2	9.2	+ 35	+ 15	- 28	-246	247.9	+ 5.5	+ 72.2	-237.1	-196.9	- 57.6	-121.8
RV Aql	193670	9.3	8.3	- 74	- 96	- 24	- 30	103.5	- 14.5	+ 91.7	- 45.8	- 72.5	+ 48.1	- 16.8
TU Cyg	194349	9.4	7.8	- 80	- 84	- 19	- 19	88.2	- 35.0	+ 28.5	- 75.8	- 75.8	- 23.5	- 3.3
V Aqr	204202	8.3	7.8	- 44	- 58	0	+ 38	69.3	- 38.5	+ 45.1	+ 35.9	- 1.9	+ 42.7	+ 49.5
T Aqr	204506	7.8	7.3	- 39	- 49	- 55	- 33	80.7	- 75.6	+ 2.9	- 28.1	- 48.9	- 27.9	+ 57.8
RS Aqr	210504	10.2	9.7	....	....	+ 47	- 24	.....						
X Peg	211614	9.4	8.6	- 56	- 71	- 20	- 47	87.4	- 56.5	+ 22.5	- 62.8	- 74.3	- 24.7	+ 22.6
S Mic	212130	9.0	8.5	+ 49	+ 43	-101	- 53	121.8	- 56.5	- 84.2	- 67.5	- 30.0	-120.3	+ 37.4
RT Peg	220035	9.9	9.1	-116	-117	+142	+ 8	183.6	- 6.3	+173.5	- 59.9	-116.8	+112.8	- 44.7
Y Peg	220714	10.5	10.0	- 85	-100	-154	+154	239.5	-190.9	- 71.9	+125.5	- 24.3	- 33.1	+231.8
RT Aqr	221823	9.1	8.7	- 34	- 41	+359	- 14	361.6	+116.1	+342.5	+ 2.6	- 86.4	+306.1	+153.0
S Lac	222540	8.2	7.4	- 60	- 57	- 4	- 15	59.0	- 32.9	+ 10.1	- 48.0	- 46.1	- 27.0	+ 10.0
R Ind	222968	8.4	8.0	....	....	+ 9	+ 52	.....						
RW Peg	225915	9.7	9.3	- 76	- 76	0	- 19	78.3	- 66.2	+ 17.9	- 37.8	- 58.4	- 18.2	- 42.7
V Cas	230759	7.9	6.8	- 30	- 23	+ 59	- 31	70.5	- 27.9	+ 54.1	- 35.6	- 27.5	+ 24.1	- 43.1

TABLE VI (continued)

Star	Desig.	m	m'	R	R _p	T _α	T _δ	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 4 250 ^d ≤ P ≤ 299 ^d														
RV Cep	000873	9.7	8.1	..	....	0	+ 11	.....						
T And	001726	9.5	7.9	- 90	- 80	- 38	+ 62	108.0	- 96.0	- 45.3	+ 19.9	- 0.7	- 50.6	+105.3
U Cas*	004148	8.4	7.4	- 45	- 33	- 26	- 22	47.4	- 1.2	- 26.6	- 39.2	- 7.6	- 51.8	- 7.2
V And	004535	9.4	8.8	+ 16	+ 35	0	- 68	76.5	+ 66.5	+ 13.2	- 35.5	+ 9.8	- 8.6	- 70.6
RX Psc	012021	9.5	8.9	....	....	0	- 61	.....						
S Ari	015912	10.8	10.2	- 27	- 8	+ 12	- 83	84.3	+ 2.2	+ 15.1	- 82.9	- 57.7	- 34.5	- 37.5
Z Cep	021381	10.8	9.2	....	....	+ 55	- 79	.....						
R Tri	023134	6.2	5.7	+ 67	+ 72	+ 37	- 22	84.0	+ 34.4	+ 73.4	+ 21.8	+ 8.8	+ 68.1	- 26.6
T Eri	035121	8.0	7.7	+ 42	+ 35	+ 99	+ 47	115.2	- 56.5	+ 96.3	+ 28.4	- 40.8	+ 82.2	+ 52.8
R Ret	043253	7.6	7.1	+ 26	+ 27	+ 51	+ 82	100.2	- 15.5	+ 98.2	+ 12.8	- 32.1	+ 80.9	+ 11.1
V Ori	050104	3.4	8.6	+ 22	+ 10	- 14	+ 20	26.4	+ 15.6	+ 4.7	+ 20.7	+ 31.2	+ 5.5	+ 1.3
W Aur	052227	9.2	7.3	-132	-128	+ 3	- 37	133.4	- 17.0	- 78.7	-106.3	- 41.1	-130.8	- 17.3
S Lyn	063658	9.6	8.9	- 11	- 4	- 47	0	47.2	+ 46.1	+ 9.4	+ 3.4	+ 3.7	+ 31.0	- 17.0
X Gem	064130	8.2	7.0	+ 75	+ 73	0	- 56	92.0	- 16.2	+ 89.9	+ 11.4	- 30.0	+ 72.7	+ 12.3
V Gem	071813	8.5	7.8	+ 22	+ 10	- 34	- 52	63.0	+ 24.9	+ 31.8	- 48.3	- 28.7	- 2.2	- 43.1
S Gem	073724	9.0	8.6	+111	+ 99	- 41	- 54	120.1	- 8.7	+119.4	- 9.7	- 54.7	+ 90.2	- 8.7
T Gem*	074324	8.7	8.3	+ 22	+ 12	0	- 58	62.9	+ 3.8	+ 40.3	- 48.1	- 42.1	+ 3.2	- 26.5
V Cnc*	081618	7.9	7.5	- 1	- 10	-	+ 16	69.5	+ 63.5	+ 25.6	+ 12.2	+ 38.3	+ 24.9	- 47.3
RT Hya	082506	7.4	6.8	+ 40	+ 31	+ 50	-153	164.0	- 49.3	- 17.5	+155.4	+110.8	+ 43.7	+123.9
S Hya	084803	7.8	7.4	+ 74	+ 64	- 26	+ 47	83.5	- 21.7	+ 62.7	+ 50.7	+ 8.9	+ 67.1	+ 38.5
T Hya	085109	7.8	7.2	- 3	- 13	- 27	+ 10	31.6	+ 27.5	+ 10.0	+ 11.9	+ 27.9	+ 7.3	- 14.0
V Leo	095422	9.1	8.8	- 23	- 32	+ 47	-142	153.0	- 44.1	- 28.2	-143.7	-105.5	-106.9	- 18.0
S Sex	103000	9.1	8.7	- 5	- 13	- 95	- 74	121.2	+ 48.3	+ 82.9	- 74.0	- 58.6	+ 33.2	- 84.2
RZ Car	103370	10.0	8.4	....	....	- 30	0	.....						
T CVn	122532	9.6	9.4	....	....	+228	-133	.....						
T UMa	123260	7.7	7.4	- 91	- 95	- 73	- 55	131.8	- 19.2	+ 72.3	-109.8	-109.7	+ 6.7	- 47.7
RS UMa	123459	9.0	8.7	- 26	- 20	-176	- 74	192.0	- 79.0	+166.1	- 55.3	-144.6	+102.6	- 22.6
RV Vir	130313	10.8	10.5	+ 33	+ 59	- 32	+174	186.5	-100.8	+ 4.9	+156.9	+ 76.9	+ 59.3	+165.8
RT Cen	134236	9.0	8.5	....	....	- 18	- 89	.....						
Z Boo	140214	9.3	9.0	+ 40	+ 40	- 63	+ 8	75.0	- 63.6	+ 35.7	+ 17.4	- 23.2	+ 23.6	+ 64.2
S Boo	142054	8.4	8.1	- 17	- 16	+ 63	- 84	106.3	- 12.2	- 85.4	- 62.1	- 2.7	-115.2	+ 0.3
R Cam*	142584	8.3	7.6	- 33	- 24	- 32	- 4	40.2	- 20.2	+ 24.8	- 24.3	- 29.0	- 1.5	+ 8.0
V Boo	142639	7.8	7.6	- 36	- 40	+115	- 32	125.9	+ 76.9	- 86.2	- 50.1	- 47.8	-103.0	- 69.9
V Lib	143517	9.7	9.3	+ 15	+ 31	- 66	+ 19	75.4	- 68.8	+ 29.5	- 8.9	- 42.8	+ 5.4	+ 57.3
RT Lib	150118	9.0	8.2	+ 41	+ 49	- 21	- 21	57.2	- 43.0	- 13.5	- 35.3	- 31.3	- 42.2	+ 28.2
Y Lib	150606	8.6	8.2	- 7	- 5	- 53	- 74	91.1	- 30.1	+ 45.3	- 73.1	- 79.4	+ 6.7	- 9.9
RR Lib	155118	8.6	7.8	- 33	- 30	+ 43	- 26	58.5	+ 55.9	+ 7.9	- 15.4	+ 22.4	- 4.6	- 51.1
Z CrB	155230	10.0	9.6	- 81	- 97	-180	+370	422.8	- 11.3	+321.7	+274.1	+ 67.0	+399.7	+ 93.8
W Her	163238	8.3	7.9	- 51	- 60	- 33	+109	128.8	+ 12.3	+118.1	+ 49.8	- 1.0	+116.3	- 0.3
RR Oph	164319	8.9	7.4	+ 60	+ 60	- 4	- 36	70.2	- 18.6	- 41.0	- 53.8	- 40.2	- 58.4	+ 3.5
RR Sco	165030	5.9	4.4	- 36	- 35	- 16	- 14	41.0	- 4	+ 40.4	+ 5.6	- 5.8	+ 27.9	+ 5.9
RT Her	170727	9.4	8.6	- 66	- 84	+ 14	- 68	109.0	+ 23.7	+ 39.2	- 98.9	- 70.2	- 19.7	- 67.0
V Dra	175655	9.9	9.1	+ 13	+ 7	0	+ 16	17.5	+ 0.1	+ 9.1	+ 14.9	+ 17.2	+ 5.2	+ 11.3
W Dra	180666	9.6	8.8	- 21	- 17	- 34	+115	121.1	- 36.7	+111.1	- 31.4	- 33.8	+ 99.1	+ 35.2
SV Dra	183149	9.7	8.0	+ 22	+ 15	+ 47	+ 38	62.2	+ 44.0	+ 25.1	+ 36.2	+ 47.5	+ 33.1	- 19.4
RS Dra	184074	9.1	8.7	- 29	- 19	- 7	- 7	21.4	- 6.6	- 2.7	- 20.2	- 6.9	- 22.2	+ 2.6
Z Lyr	185635	10.1	9.7	+ 5	- 21	+ 47	- 47	69.7	+ 47.9	+ 2.1	- 50.6	- 5.0	- 27.7	- 60.0
RT Lyr	185837	10.1	9.7	- 94	-117	+133	+114	210.7	+ 88.1	+190.4	+ 19.6	- 19.2	+175.6	- 89.8
R Sgr	191119	7.3	6.4	- 45	- 50	+ 25	- 23	60.6	+ 7.1	+ 59.9	- 5.7	- 17.9	+ 40.9	- 11.8
BG Cyg	193528	9.4	7.6	....	....	+ 28	- 8	.....						
Z Cyg	195959	8.7	7.2	-166	-168	+ 71	- 7	182.4	+ 10.5	+124.7	-132.7	-140.1	+ 39.0	- 85.3
RU Aql	203813	9.3	8.6	+ 20	- 3	+ 54	+ 41	67.8	+ 39.4	+ 38.8	+ 39.3	+ 41.3	+ 16.3	- 16.2
R Del	201009	9.3	7.5	- 46	- 60	- 8	- 36	70.4	- 35.5	+ 41.1	- 44.8	- 59.0	+ 2.4	+ 9.6
S Del	203817	8.8	8.0	- 13	- 27	+ 81	+ 38	93.4	+ 38.9	+ 80.0	- 28.6	+ 14.8	+ 77.3	- 27.6
RZ Cyg	204847	10.3	8.0	- 47	- 49	+ 43	- 24	69.6	+ 21.3	+ 40.7	- 52.2	- 37.1	+ 3.8	- 43.3

TABLE VI (continued)

Star	Design.	m	m'	R	R _p	T _α	T _δ	W	$\bar{x}_e$	$\bar{y}_e$	$\bar{z}_e$	a	b	c
GROUP 4 $250^d \leq P \leq 299^d$ (continued)														
X Del	205017	9.0	8.2	- 57	- 71	+ 90	0	114.6	+ 20.3	+110.8	- 21.1	- 45.7	+ 79.7	- 32.9
RR Cap	205627	9.3	8.8	- 63	- 72	+142	- 27	161.5	+ 48.9	+153.6	+ 9.4	- 28.5	+134.8	- 54.6
R Equ	210812	9.3	8.5	- 54	- 69	+ 12	- 59	91.6	- 31.9	+ 46.1	- 72.4	- 80.2	- 6.6	- 8.4
T Cap	211616	9.5	9.0	+ 42	+ 26	+ 16	-142	145.2	+ 0.6	+ 20.7	-145.7	-106.7	- 59.4	- 64.5
RR Peg	214025	9.2	8.4	- 30	- 38	0	- 41	55.9	- 14.4	+ 10.0	- 52.1	- 41.0	- 27.4	- 7.6
S PsA	215829	9.2	8.8	....	....	+115	- 34	....	- 53.3	+ 57.1	- 6.3	- 46.1	+ 32.6	+ 40.3
S Aqr	225221	8.2	7.8	- 58	- 61	+ 39	- 30	78.4	- 53.3	+ 57.1	- 6.3	- 46.1	+ 32.6	+ 40.3
UZ Cep	230570	9.9	7.2	....	....	+ 41	+ 3	....	- 20.4	- 7.1	- 79.4	- 63.1	- 42.4	- 12.6
R Phe	235150	8.0	7.9	+ 23	+ 26	- 57	- 9	63.2	+ 7.5	- 57.2	- 25.7	- 21.0	- 71.3	- 4.0
V Cet	235370	9.4	9.3	+ 51	+ 51	- 76	- 76	118.8	+ 35.3	- 77.1	- 93.3	- 0.7	-113.1	- 51.7
GROUP 5 $300^d \leq P \leq 349^d$														
S Cet	001910	8.2	8.0	+ 33	+ 34	+ 80	+ 21	89.6	+ 30.4	+ 22.9	+ 14.9	- 1.7	+ 73.0	- 26.2
Y Cep	003180	9.6	8.5	0	+ 11	+ 51	- 44	68.2	+ 37.9	+ 55.7	+ 3.0	+ 5.4	+ 45.2	- 34.2
RR And*	004634	3.9	8.4	- 71	- 67	- 3	- 54	82.3	- 20.4	- 7.1	- 79.4	- 63.1	- 42.4	- 12.6
RV Cas	004747	9.4	8.6	- 67	- 54	+ 51	- 12	75.2	- 38.0	+ 44.1	- 47.6	- 63.8	+ 3.2	+ 9.8
U And	011040	10.0	9.6	- 4	+ 15	+ 34	- 18	344.8	- 81.2	+ 25.1	- 4.1	-182.4	+ 275.7	+ 23.9
UZ And	011041	10.3	9.8	- 39	- 17	+115	+ 7	116.4	- 51.4	+104.3	- 5.9	- 65.7	+ 74.5	+ 32.1
R Psc	012602	8.2	7.3	- 45	- 42	+ 35	- 37	68.2	- 51.5	+ 21.6	38.7	- 53.7	- 14.3	+ 29.2
U Per	015354	8.2	7.4	+ 17	+ 25	+ 67	- 19	74.0	- 5.2	+ 73.2	+ 9.2	- 16.7	+ 58.4	+ 3.3
o Cet	021403	3.4	3.1	+ 64	+ 64	+ 2	- 67	92.7	+ 49.8	+ 35.5	- 69.6	- 34.5	- 5.9	- 75.2
T Ari	024317	8.6	8.1	+ 7	+ 12	- 56	- 41	70.4	+ 54.3	- 27.0	- 35.7	+ 22.3	- 45.1	- 53.8
R Tau	042310	8.6	7.8	+ 32	- 30	- 18	- 3	35.2	+ 28.8	+ 20.0	+ 2.2	+ 16.8	+ 11.8	- 21.1
RA Tau	043308	9.6	8.3	- 22	- 26	- 4	108	111.2	- 0.2	- 11.3	-110.6	- 76.5	- 57.8	- 44.6
S Col	054332	9.3	9.9	+ 73	+ 60	- 71	+ 28	97.1	+ 75.6	+ 60.4	- 7.6	+ 13.2	+ 47.2	- 72.7
V Mon	061902	7.0	6.4	+ 30	+ 25	+ 15	- 10	56.8	- 16.9	+ 23.3	- 10.9	- 16.7	+ 3.9	+ 11.8
S CMi	072709	7.5	7.2	+ 68	+ 62	- 32	- 16	71.5	+ 6.0	+ 71.0	- 5.6	- 24.2	+ 49.7	- 13.8
T CMi	072812	10.5	10.2	+ 35	+ 12	+ 79	- 40	89.3	- 80.7	- 11.2	- 35.6	- 50.8	- 45.0	- 60.9
U Cnc	083019	9.9	9.6	+ 72	+ 59	+ 6	- 47	75.7	- 48.1	+ 52.8	- 25.0	- 55.9	- 19.6	+ 28.0
RW Car	091868	9.3	8.4	....	....	- 61	+ 20	....	- 64.4	+137.0	- 20.5	+ 57.1	-125.9	- 81.7
X Hya	093111	3.4	8.1	+ 42	+ 36	- 1.8	- 12	152.8	- 27.3	-135.1	+ 12.2	- 54.6	+112.1	+ 15.6
Y Dra	093178	9.2	6.6	+ 23	+ 33	- 91	- 99	138.4	- 27.3	-135.1	+ 12.2	- 54.6	+112.1	+ 15.6
RR Hya	094024	9.3	8.7	+ 47	+ 42	- 32	- 12	54.1	9.3	+ 45.5	- 27.8	- 35.9	- 15.7	- 6.3
R Leo	094212	5.8	5.5	+ 13	+ 11	+ 6	- 32	34.3	- 17.7	+ 4.8	- 29.0	- 22.2	- 21.0	+ 7.1
R UMa	103069	7.5	7.2	+ 34	+ 38	- 55	- 16	68.7	- 7.1	+ 61.5	+ 29.9	+ 0.7	- 57.4	+ 16.6
X Cen	114441	8.0	7.6	+ 38	+ 43	- 9	+ 14	46.2	- 40.9	+ 11.2	- 17.8	- 28.4	- 11.8	+ 31.1
T Vir	121005	9.6	9.2	+ 22	+ 45	+ 5	+ 63	68.3	- 31.6	- 6.4	+ 60.2	+ 42.9	+ 9.9	+ 62.5
R Crv	121419	7.5	7.1	- 22	- 19	- 11	- 8	23.4	+ 19.9	+ 12.3	- 1.5	+ 13.2	+ 2.2	- 13.9
T UMi	133374	9.2	8.9	- 3	+ 4	- 47	- 4	47.4	- 23.0	+ 41.3	+ 2.7	- 17.6	+ 25.7	+ 20.5
R CVn	134540	7.7	7.5	- 6	- 6	- 32	+ 23	39.8	+ 3.3	+ 37.2	+ 13.7	+ 5.4	+ 29.6	+ 3.8
RX Cen	134626	9.4	9.0	- 1	+ 14	- 57	-123	136.2	+ 29.9	+ 78.6	-107.2	- 91.8	+ 11.9	- 81.6
Z Vir	140513	10.4	10.1	+ 68	+ 81	- 79	- 79	136.0	- 93.6	+ 35.6	- 95.0	-125.9	- 15.9	+ 27.5
RU Hya	140626	8.4	7.6	+ 2	+ 8	+ 12	- 59	60.7	+ 24.3	+ 0.7	- 55.7	- 20.3	- 32.8	- 41.3
U UMi	141567	8.2	7.9	- 26	- 23	- 31	+ 42	57.0	+ 22.4	+ 52.2	- 4.9	- 6.3	+ 35.6	- 24.3
RU Lib	152815	8.1	7.4	- 47	- 45	- 24	- 4	51.1	+ 8.5	+ 49.8	- 7.7	- 2.7	+ 38.3	- 5.6
S UMi	153479	8.4	8.0	- 40	- 35	-133	+ 27	140.3	- 87.0	+106.1	- 29.2	-102.3	+ 60.5	+ 51.6
R Her	160219	8.8	8.4	- 30	- 36	- 27	0	45.0	- 6.7	+ 43.0	- 11.5	- 21.3	+ 21.7	- 0.4
R UMi	162172	9.1	8.8	- 22	- 17	+ 43	+ 78	90.7	+ 69.6	- 57.4	+ 7.3	- 23.1	+ 50.7	- 60.4
S Her	164715	7.6	6.9	- 10	- 14	+ 26	+ 25	38.6	+ 30.9	+ 10.9	- 20.4	- 35.7	+ 12.4	- 12.8
RS Sco	164845	7.0	1.0	+ 7	+ 7	+ 2	3	7.8	+ 1.1	- 3.3	- 7.0	+ 7.0	- 15.8	+ 2.1
R Oph	170216	7.6	6.6	- 47	- 48	- 43	26	69.4	- 28.3	+ 52.3	- 11.8	- 40.9	- 36.2	+ 15.6
Z Oph	171402	8.1	6.8	- 78	- 82	- 12	+ 7	83.2	+ 4.4	+ 83.0	+ 4.7	- 21.8	- 65.5	- 0.5

TABLE V₁ (continued)

Star	Desig.	m	m'	R	R _p	T _α	T _δ	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 5 300 ^d ≤ P ≤ 349 ^d (continued)														
TV Her	181132	9.7	9.3	- 66	- 82	- 53	- 42	106.3	- 55.2	+ 45.0	- 78.9	- 96.0	- 11.7	+ 9.6
RV Sgr	182133	7.8	6.3	+ 24	+ 24	+ 16	- 11	30.9	+ 17.2	- 12.5	- 22.4	+ 7.4	- 29.5	- 17.8
I Ser	182406	9.7	8.7	+ 4	- 10	- 4	+ 12	16.1	- 5.1	+ 10.8	+ 10.8	+ 10.9	+ 4.3	+ 13.7
RZ Her	183326	9.5	9.1	+ 38	+ 22	- 24	- 62	70.1	- 17.2	- 45.9	- 45.1	- 10.3	- 76.8	+ 7.1
X Oph	183409	6.8	6.0	- 71	- 75	+ 8	- 22	78.5	- 2.4	+ 71.2	- 23.1	- 47.8	+ 37.2	- 18.4
RY Lyr	184135	9.8	9.4	- 19	- 34	+ 11	- 11	37.4	+ 6.9	+ 23.4	- 28.4	- 18.3	- 2.2	- 17.1
R Aql	190268	6.2	4.7	+ 32	+ 30	0	- 36	46.9	+ 9.3	- 33.5	- 31.4	- 32.5	+ 4.2	- 6.2
TY Lyr	190628	9.7	8.5	....	....	+ 15	+ 11	....	....	....	....	....	....	....
RX Sgr	190919	9.7	9.0	- 23	- 33	- 38	+ 52	72.3	- 40.5	+ 2.5	+ 59.9	+ 34.9	+ 16.7	+ 68.5
RS Lyr	190933	10.2	9.0	- 18	- 31	- 5	- 9	32.6	- 11.0	+ 18.5	- 24.5	- 21.9	- 5.9	+ 1.4
U Dra	191067	9.5	8.5	0	+ 3	- 25	- 18	34.2	- 22.3	- 25.6	- 4.2	+ 7.9	- 36.3	+ 27.4
RT Aql	193311	8.7	8.2	- 41	- 53	+ 51	- 16	75.3	+ 27.5	+ 65.0	- 26.2	- 26.8	+ 37.6	- 39.4
X Aql	194604	9.1	8.4	+ 24	+ 12	+ 3	- 30	32.4	+ 9.1	- 11.4	- 29.0	- 2.0	- 32.7	- 13.6
RR Sgr	195029	6.8	6.3	+ 85	+ 83	- 20	- 14	86.6	+ 12.4	- 67.3	- 53.0	+ 7.3	- 92.5	- 19.4
S Cyg*	200358	10.3	9.3	- 17	- 16	+ 26	+ 16	34.4	+ 11.0	+ 32.2	- 5.0	+ 1.9	+ 19.1	- 10.8
SZ Cep*	201377	9.6	8.6	....	....	+ 55	- 67	....	....	....	....	....	....	....
U Mic	202341	8.8	8.3	....	....	+ 17	- 54	....	....	....	....	....	....	....
RU Cap	202722	9.7	9.2	....	....	+ 47	- 79	....	....	....	....	....	....	....
Z Del*	202817	8.8	8.1	+ 34	+ 25	0	- 27	36.7	+ 19.2	- 25.4	- 18.4	+ 17.4	- 38.6	- 15.7
ST Cyg	203055	9.9	8.5	- 14	- 13	+ 22	- 15	29.6	+ 20.3	+ 9.7	- 19.3	+ 1.2	- 8.4	- 22.3
T Del	204116	9.3	8.6	- 10	- 21	+ 4	+ 32	38.5	- 15.6	+ 24.9	+ 25.0	+ 10.2	+ 22.1	+ 27.4
TW Cyg	210229	10.0	9.2	....	....	+ 32	- 32	....	....	....	....	....	....	....
TU Peg	214012	8.9	8.5	....	....	+ 18	- 62	....	....	....	....	....	....	....
R Gru	214247	8.3	7.9	....	....	+ 36	- 25	....	....	....	....	....	....	....
WY Cyg	214544	8.6	8.0	....	....	+ 74	0	....	....	....	....	....	....	....
V Peg	215506	8.7	8.3	- 25	- 31	+ 64	- 14	72.4	+ 7.8	+ 70.0	- 16.9	- 29.5	+ 44.9	- 23.0
R Lac	223942	9.1	8.4	+ 18	+ 22	+ 37	+ 27	50.7	+ 11.3	+ 35.2	+ 34.8	+ 25.9	- 38.4	- 6.8
SZ And	225542	10.6	10.0	....	....	+ 47	- 20	....	....	....	....	....	....	....
W Peg	231526	8.2	7.8	- 21	- 19	+ 32	- 11	38.8	- 5.8	+ 33.9	- 18.1	- 21.5	+ 10.8	- 7.8
S Peg	231608	8.0	7.6	+ 5	+ 5	- 26	- 73	77.7	+ 10.3	- 28.5	- 71.5	- 25.8	- 57.4	- 31.7
RR Cas	235153	10.5	9.8	- 46	- 26	+ 41	- 14	50.6	- 2.8	+ 41.2	- 29.2	- 31.7	+ 12.5	- 11.4
Z Peg	235525	8.4	8.0	- 31	- 26	+ 27	- 39	54.1	- 6.2	+ 27.1	- 46.4	- 39.9	- 8.0	- 14.4
SV And	235940	8.7	8.2	- 87	- 79	+ 41	+ 9	89.4	- 66.4	+ 41.2	- 43.4	- 73.3	- 1.0	+ 36.5
GROUP 6 350 ^d ≤ P ≤ 393 ^d														
S Scl	001033	6.7	6.5	+ 35	+ 35	+ 67	+ 14	76.7	+ 33.9	+ 68.5	- 7.1	- 0.5	+ 45.3	- 46.4
X Psc	010722	9.2	8.7	+ 11	+ 20	+ 90	- 17	93.7	- 2.0	+ 93.3	- 8.4	- 38.7	+ 68.5	- 10.4
RZ Per*	012450	9.4	8.7	- 10	+ 5	+ 23	- 17	31.5	+ 5.9	+ 30.1	- 7.0	- 5.9	+ 14.1	- 6.9
W And	021144	7.4	6.7	- 29	- 23	+ 12	- 3	26.1	- 18.7	- 2.2	- 18.1	- 13.4	- 18.4	+ 13.1
RR Per	022251	9.2	8.5	+ 9	+ 24	0	- 4	24.4	+ 14.9	+ 10.6	+ 16.1	+ 24.5	+ 8.6	- 1.2
RR Cep	022981	10.2	5.1	....	....	- 5	+ 5	....	....	....	....	....	....	....
U Ari	030614	8.0	7.5	- 37	- 34	- 20	- 40	56.2	- 1.3	- 30.5	- 47.2	- 11.6	- 58.9	- 10.5
S Tau	042410	10.2	9.5	+ 40	+ 36	- 71	+ 95	124.0	+ 72.7	- 11.2	+ 99.8	+ 125.9	+ 32.3	- 9.2
T Cam*	043066	8.0	6.9	- 2	+ 4	- 15	- 26	30.3	+ 23.5	+ 17.8	- 6.9	+ 3.4	+ 5.2	- 20.3
R Cae	043738	7.9	7.6	....	....	- 32	- 10	....	....	....	....	....	....	....
T Lep	050122	8.3	8.0	- 4	- 13	+ 41	- 88	97.9	- 51.1	- 33.0	- 76.7	- 57.2	- 79.5	+ 19.5
U Ori	055020	6.3	5.8	- 21	- 22	- 13	- 11	27.8	+ 12.3	- 17.4	- 17.9	+ 10.6	- 32.3	- 10.4
R Lyn*	065355	7.9	7.2	+ 28	+ 32	- 50	- 22	63.3	+ 40.3	+ 46.8	+ 13.9	+ 19.3	+ 41.9	- 29.5
R Gem*	070123	7.1	6.3	- 41	- 43	- 4	- 4	43.3	+ 13.9	- 35.6	- 20.4	+ 17.9	- 19.2	- 10.3
V CMi	070209	8.7	7.8	+ 37	- 29	- 47	+ 45	71.3	+ 39.6	+ 33.3	+ 49.1	+ 50.9	+ 46.2	- 10.8

TABLE VI (continued)

Star	Desig.	π	m'	R	R_p	T_α	T_L	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 6 $350^d \leq P \leq 399^d$ (continued)														
RR Mon*	071201	9.4	8.5	+ 28	+ 14	- 8	- 36	39.5	+ 2.9	+ 16.6	- 35.7	- 22.5	- 11.5	- 1.2
R Cnc	081112	6.8	6.5	+ 32	+ 28	+ 3	- 12	30.6	- 18.7	+ 23.5	- 5.9	- 14.0	+ 5.9	+ 10.9
W Cnc	090426	8.2	7.9	+ 49	+ 45	- 50	- 33	75.0	- 4.7	+ 7.1	- 10.2	- 33.4	+ 50.1	- 5.8
R LMi	094035	7.1	6.9	+ 10	+ 9	+ 12	+ 4	15.5	- 11.0	- 6.9	+ 8.5	+ 1.6	- 20.3	+ 12.5
W Vel	101254	8.8	7.9	....	....	- 39	+ 21	.....						
W Leo	104814	9.8	9.5	+ 54	+ 49	+101	+ 71	132.9	- 59.7	- 86.9	+ 80.9	+ 31.1	- 54.1	+109.2
R Com	115919	8.5	8.3	- 3	- 3	- 41	+ 14	43.4	+ 7.6	+ 11.9	+ 12.2	+ 4.3	+ 32.5	- 1.6
R Hya	132423	2.5	4.2	- 10	- 9	- 21	- 1	22.9	+ 0.5	+ 22.7	+ 2.6	+ 2.1	+ 11.4	+ 3.1
S Vir	132807	7.0	6.7	+ 10	+ 12	- 27	- 46	54.7	- 16.2	+ 22.6	- 17.1	- 43.2	- 13.5	- 5.5
W Hya	134328	7.2	7.0	+ 42	+ 47	- 53	-110	151.5	- 31.7	+ 88.0	-119.2	-134.3	+ 7.9	- 35.9
R Ser	154615	6.9	6.4	24	+ 22	+ 2	- 37	70.6	- 19.0	- 34.3	- 58.7	- 16.1	- 75.0	- 6.3
Z Sco	160021	9.2	8.1	- 52	- 49	- 13	- 32	60.0	+ 17.4	+ 56.1	- 11.9	- 16.0	+ 35.7	- 23.2
Y Sco	162419	11.3	10.0	....	....	+ 71	- 71	.....						
T Oph	162816	9.2	8.5	- 47	- 48	+ 16	- 4	50.7	- 32.3	+ 35.2	+ 17.0	+ 22.3	+ 32.4	- 19.5
RW Sco	170333	9.6	8.1	....	....	+ 28	+ 41	.....						
ST Sgr*	185613	9.0	7.8	+ 46	+ 39	- 3	- 17	42.6	+ 5.4	- 33.9	- 25.3	+ 9.5	- 50.8	- 5.8
V Lyr	190530	9.7	8.5	- 22	- 34	- 12	- 4	36.2	- 19.2	+ 23.1	- 20.2	- 24.7	- 1.1	+ 9.7
T Sgr*	191017	8.0	7.2	+ 2	- 3	+ 4	- 28	28.4	+ 0.4	+ 11.8	- 25.9	- 14.3	- 11.9	- 8.3
RR Aql	195202	8.9	8.1	+ 11	0	- 51	-142	150.9	- 47.6	- 19.2	-141.9	-110.7	- 97.6	- 15.1
SY Aql	200213	9.4	8.7	- 68	- 76	-108	- 39	137.9	-126.5	+ 1.4	- 54.7	- 91.8	- 7.0	- 90.8
W Aqr	204124	7.1	8.7	- 15	- 28	+ 13	- 78	84.0	- 12.1	+ 34.4	- 75.6	- 67.9	- 16.6	- 24.2
T Cep	210868	6.0	4.9	- 12	- 11	- 24	- 31	40.7	+ 1.7	- 34.4	- 21.8	- 10.2	- 50.0	- 0.5
T Peg	220412	6.9	8.5	- 10	- 15	- 12	+ 99	100.8	- 36.7	+ 6.6	+ 93.7	- 59.5	+ 36.2	+ 60.8
RV Peg	222130	9.9	9.4	- 32	- 32	+ 12	- 41	53.4	- 1.6	+ 13.9	- 51.5	- 35.3	- 22.0	- 19.2
R Peg	230210	1.8	7.4	+ 20	+ 19	+ 43	- 12	48.5	+ 30.9	+ 36.4	- 8.5	+ 2.5	+ 21.1	- 30.7
R Aqr	233016	7.5	7.3	- 22	- 23	+133	- 86	160.0	- 33.0	+135.7	- 76.4	-124.9	+ 71.4	- 21.9
W Cet*	235715	7.6	7.4	+ 13	- 13	- 5	0	14.3	+ 12.1	- 6.2	- 3.4	+ 16.5	- 15.7	- 5.5
GROUP 7 $400^d \leq P \leq 449^d$														
T Cas	031855	7.9	7.3	- 12	- 7	+ 46	- 13	48.4	+ 5.6	+ 46.4	- 13.1	- 19.0	+ 25.1	- 10.7
R And*	001938	6.8	6.5	- 11	- 8	- 4	- 39	39.9	+ 17.9	- 2.5	- 35.6	- 6.8	- 26.8	- 26.0
RV And	004232	8.6	8.1	- 15	- 9	- 25	- 20	33.2	- 1.6	+ 25.1	- 21.7	- 18.2	+ 2.2	- 6.5
S Psc	011208	3.6	9.2	....	....	- 4	+ 4	.....						
R Hor	025150	6.0	5.7	+ 60	+ 60	-100	+ 26	119.5	- 24.8	+113.1	- 29.5	- 75.4	+ 72.9	- 1.5
S Pic	050849	8.1	7.7	....	....	+ 34	+ 9	.....						
S Ori	052405	8.4	7.9	+ 22	+ 16	+ 19	- 28	37.4	- 16.7	+ 16.5	- 29.2	- 12.2	- 39.6	+ 9.2
U Aur	053652	8.3	7.7	+ 15	+ 16	+ 26	- 30	42.8	- 22.7	+ 32.1	- 16.9	- 26.1	+ 8.1	- 12.6
U Lyn	063260	9.5	8.8	- 16	- 8	0	- 35	35.8	- 3.6	+ 25.0	- 24.4	- 21.6	+ 1.1	- 6.3
U CMi	073609	8.8	8.5	+ 56	+ 47	- 11	- 11	12.6	- 9.5	+ 48.5	- 3.8	- 19.0	+ 30.3	+ 5.0
U Her	162119	7.5	7.1	- 28	- 31	- 22	- 17	42.2	- 11.0	+ 31.2	- 26.2	- 28.9	- 4.4	- 1.4
RT Sco	165737	8.2	7.0	- 53	- 51	- 8	- 3	51.7	+ 3.9	+ 43.2	+ 28.1	+ 13.2	+ 41.7	- 8.5
RT Oph	175211	9.6	9.0	- 40	- 51	- 27	- 24	62.4	- 25.4	+ 46.2	- 33.4	- 48.1	- 12.6	+ 4.8
S Lyr*	190926	10.8	10.0	....	....	+ 26	- 42	.....						
R Cyg*	193450	7.5	6.4	- 25	- 26	+ 1	+ 9	27.5	- 8.6	+ 22.0	- 14.1	- 14.4	+ 2.2	+ 3.5
X Cyg	194733	5.2	4.4	- 2	- 3	- 9	- 15	17.6	- 5.5	- 8.9	- 14.2	+ 0.9	- 24.7	+ 5.3
RS Aql	195438	9.4	8.5	0	- 3	+ 17	- 11	22.1	+ 10.0	+ 17.3	- 9.6	+ 0.1	+ 1.2	- 10.0
SX Cyg	201231	9.0	7.0	- 8	- 11	- 9	- 23	27.0	- 6.3	+ 5.9	- 25.4	- 8.6	- 28.1	+ 0.3
S Ind	204955	8.2	7.8	....	....	+ 6	- 8	.....						
RS Peg	220714	9.3	8.9	- 28	- 32	+ 44	+ 61	81.8	- 19.7	+ 60.5	+ 51.4	+ 31.4	+ 69.2	+ 4.5
SS Peg	222924	8.3	8.0	- 17	17	+ 28	43	54.1	- 19.7	+ 38.6	+ 32.4	+ 7.7	+ 37.4	+ 32.1
R Cas	235351	7.0	6.5	+ 21	+ 24	+ 99	+ 18	103.4	+ 4.3	+ 98.9	+ 30.0	- 9.5	- 91.6	+ 0.5
Y Cas	235855	9.8	3.2	- 12	- 1	+ 11	- 7	13.1	+ 5.2	+ 11.0	- 4.8	+ 4.2	- 1.8	- 2.5

TABLE VI (continued)

Star	Desig.	m	m'	R	R _p	T _α	T _δ	W	$\dot{x}_e$	$\dot{y}_e$	$\dot{z}_e$	a	b	c
GROUP 8 $450^d \leq P \leq 612^d$														
S Cas*	011272	9.7	8.4	- 32	- 18	+ 8	+ 16	25.4	- 22.3	+ 1.2	- 12.2	- 10.3	- 16.5	+ 19.4
R Aur	050953	7.5	6.7	+ 8	+ 13	- 7	- 25	29.1	+ 12.9	+ 25.7	- 4.4	+ 1.4	+ 12.1	- 11.3
RU Aur	053338	9.5	8.6	- 38	- 34	+ 4	- 13	36.5	- 6.2	- 18.3	- 31.0	- 7.8	- 40.9	- 0.3
Z Tau	054716	9.8	9.2	....	....	0	+ 16	.....						
RU Tau	054716	10.4	9.8	....	....	- 40	- 95	.....						
V Cam	054974	9.9	8.7	....	....	- 13	+ 22	.....						
Z Pup	072820	8.1	7.6	+ 26	+ 17	0	- 16	23.3	- 3.9	+ 9.6	- 20.9	- 11.6	- 11.7	- 2.0
R Cen	140959	5.9	4.6	- 20	- 17	- 1	- 1	17.0	+ 7.5	+ 5.9	+ 14.1	+ 21.6	- 2.6	+ 5.0
R Nor	152849	7.0	5.2	....	....	- 1	- 7	.....						
RU Her	160625	8.0	7.7	- 25	- 30	- 47	- 33	64.7	- 35.1	+ 33.8	- 42.6	- 54.0	- 4.2	+ 11.7
W Aql*	191007	8.2	7.3	- 18	- 25	+ 45	0	51.4	+ 35.4	+ 37.1	+ 3.2	+ 12.8	+ 27.6	- 29.1
Z Sgr	191421	8.6	7.6	- 21	- 27	0	+ 36	45.0	- 3.9	+ 11.6	+ 43.3	+ 35.5	+ 20.3	+ 27.7
Y Del	203712	9.9	9.1	....	....	- 11	+ 11	.....						
V Dcl	204319	10.1	9.3	- 24	- 40	+ 77	+ 12	87.6	+ 31.1	+ 81.9	- 1.6	- 12.6	+ 64.6	- 33.9
RX Vul	204923	10.1	9.3	....	....	- 6	- 77	.....						
UX Cyg	205130	9.7	8.7	- 6	- 14	- 17	+ 4	22.4	- 22.1	- 1.1	- 3.5	- 2.8	- 14.8	+ 23.6
X Cep	210483	9.4	8.1	+ 21	+ 30	+ 78	+ 88	121.3	- 5.6	+ 114.0	+ 41.1	- 12.9	+ 109.1	+ 12.0
Z Cas	234056	10.0	9.2	- 32	- 15	+ 77	- 24	82.0	+ 18.3	+ 75.7	- 25.8	- 34.0	+ 46.7	- 33.9
CARBON STARS $252^d \leq P \leq 590^d$														
W Cas	004958	8.8	7.9	- 39	- 27	- 41	+ 3	49.1	- 7.8	- 43.6	- 21.3	+ 10.2	- 58.8	+ 9.3
X Cas	015059	10.1	9.0	- 55	- 33	+ 12	+ 12	37.1	- 29.7	- 2.0	- 22.0	- 19.9	- 25.1	+ 21.5
R For	022527	8.9	8.7	+ 30	+ 27	+ 74	+ 63	100.8	- 1.5	+ 90.6	+ 44.2	+ 1.4	+ 90.2	+ 15.0
Y Per	052144	8.4	6.5	- 9	- 3	- 2	0	3.7	+ 0.1	- 3.0	- 2.1	+ 10.1	- 13.4	- 5.3
R Ori	045408	9.6	8.8	+ 36	+ 28	+ 74	- 11	79.9	- 62.6	+ 49.2	- 7.0	- 47.8	+ 23.7	+ 49.4
R Lep	045515	6.8	6.5	+ 32	+ 27	+ 13	- 18	34.9	- 6.5	+ 24.1	- 24.4	- 22.0	- 0.6	- 3.9
S Aur	052034	9.0	7.8	+ 3	+ 6	- 30	- 51	59.5	- 23.8	+ 38.3	- 38.8	- 47.7	+ 3.6	- 2.9
S Cam	053069	8.2	7.0	- 13	- 6	- 9	- 27	29.1	+ 11.9	+ 21.6	- 15.1	- 5.2	+ 3.1	- 15.1
V Aur	061648	9.2	8.4	+ 6	+ 13	+ 4	- 26	29.3	- 6.9	+ 27.6	7.9	- 11.0	+ 10.0	+ 3.0
R CMi	070310	8.0	7.1	+ 48	+ 41	- 28	- 2	49.6	+ 15.8	+ 46.7	+ 5.3	+ 0.6	+ 35.3	- 12.5
T Lyn	081634	9.2	8.8	+ 6	+ 2	+ 16	- 53	55.3	- 30.6	+ 15.8	- 42.9	- 44.3	- 18.4	+ 9.8
V Hya	104721	6.4	6.0	- 15	- 15	- 34	- 9	38.2	+ 27.0	+ 25.9	- 3.1	+ 8.9	+ 14.6	- 23.5
SS Vir	122001	6.8	6.4	+ 2	+ 3	- 16	+ 46	48.8	- 3.3	+ 15.7	+ 46.1	+ 36.3	+ 24.9	+ 27.9
RU Vir	134205	10.0	9.8	+ 2	+ 7	+ 16	- 237	237.7	- 21.2	- 20.6	235.7	- 160.1	- 139.4	- 83.2
RV Cen	133156	7.7	7.3	....	....	- 11	+ 26	.....						
V CrB	154640	7.5	7.2	- 115	- 118	+ 10	- 45	126.6	+ 42.3	+ 45.3	- 110.1	- 73.1	- 17.1	- 89.1
V Oph	162112	7.5	6.1	- 37	- 37	+ 20	+ 3	42.1	+ 33.0	+ 23.8	+ 10.7	+ 23.6	+ 18.6	- 21.9
T Dra	175558	9.6	9.1	- 23	- 25	- 24	+ 201	203.9	- 15.9	+ 184.5	+ 84.5	- 21.4	+ 189.6	+ 34.3
U Lyr	191738	9.5	9.1	- 3	- 17	+ 6	+ 24	30.0	- 3.5	+ 28.5	+ 8.6	+ 1.9	+ 19.0	+ 8.6
R Cap	200015	10.6	9.7	....	....	+ 79	- 24	.....						
WX Cyg	201537	9.7	7.9	+ 32	+ 26	+ 13	- 25	38.3	+ 30.7	- 22.6	- 4.2	+ 32.2	- 28.2	- 19.4
U Cyg	201543	7.2	5.6	+ 10	+ 9	+ 15	+ 10	20.1	+ 11.7	+ 9.7	+ 3.3	+ 21.5	+ 5.8	+ 0.3
V Cyg	203848	9.1	7.5	+ 3	+ 2	+ 9	- 12	15.2	+ 13.5	- 2.2	- 6.6	+ 12.7	- 13.4	- 8.7
S Cep	213678	8.3	7.0	- 34	- 28	+ 41	+ 18	52.8	+ 5.1	+ 46.9	- 23.7	- 26.5	+ 21.0	- 16.4
RZ Peg	220133	8.8	8.1	- 27	- 28	+ 12	+ 4	30.7	- 16.4	+ 23.1	- 11.9	- 17.4	+ 3.9	+ 16.8
ST And	233435	8.8	8.2	+ 32	+ 39	+ 24	- 43	62.7	+ 58.9	- 17.4	- 12.6	+ 21.9	+ 5.7	- 53.7

EXPLANATION OF COLUMN HEADINGS

* after the star's name identifies an S-type star
 Desig. equatorial coordinates for 1900.0: first 4 figures are hours and minutes of R. A., the last two are degrees of Decl.; negative declinations are underlined
 m apparent mean maximum visual magnitude
 m' m, corrected for interstellar absorption
 R radial velocity of star relative to the sun
 R_p R - P, radial velocity corrected for galactic rotation
 T_α, T_δ tangential motion relative to sun in R. A. and Decl.

W space velocity of the star relative to the sun
 $\dot{x}_e$, $\dot{y}_e$, $\dot{z}_e$ components of W in Equat. coord. system
 a = $\dot{x}_e$ - 9.8, positive toward $l^1 = 148^\circ$, away from gal. cntr.
 b = $\dot{x}_e$ + 10.2, positive toward the galactic longitude $l^1 = 58^\circ$
 c = $\dot{x}_e$ + 5.9, positive toward the galactic North Pole
 ($\dot{y}_e$, $\dot{x}_e$, $\dot{z}_e$ are space velocity components referred to the sun in the galactic coordinate system)
 a, b, c space velocity components referred to the circular velocity around the galactic center

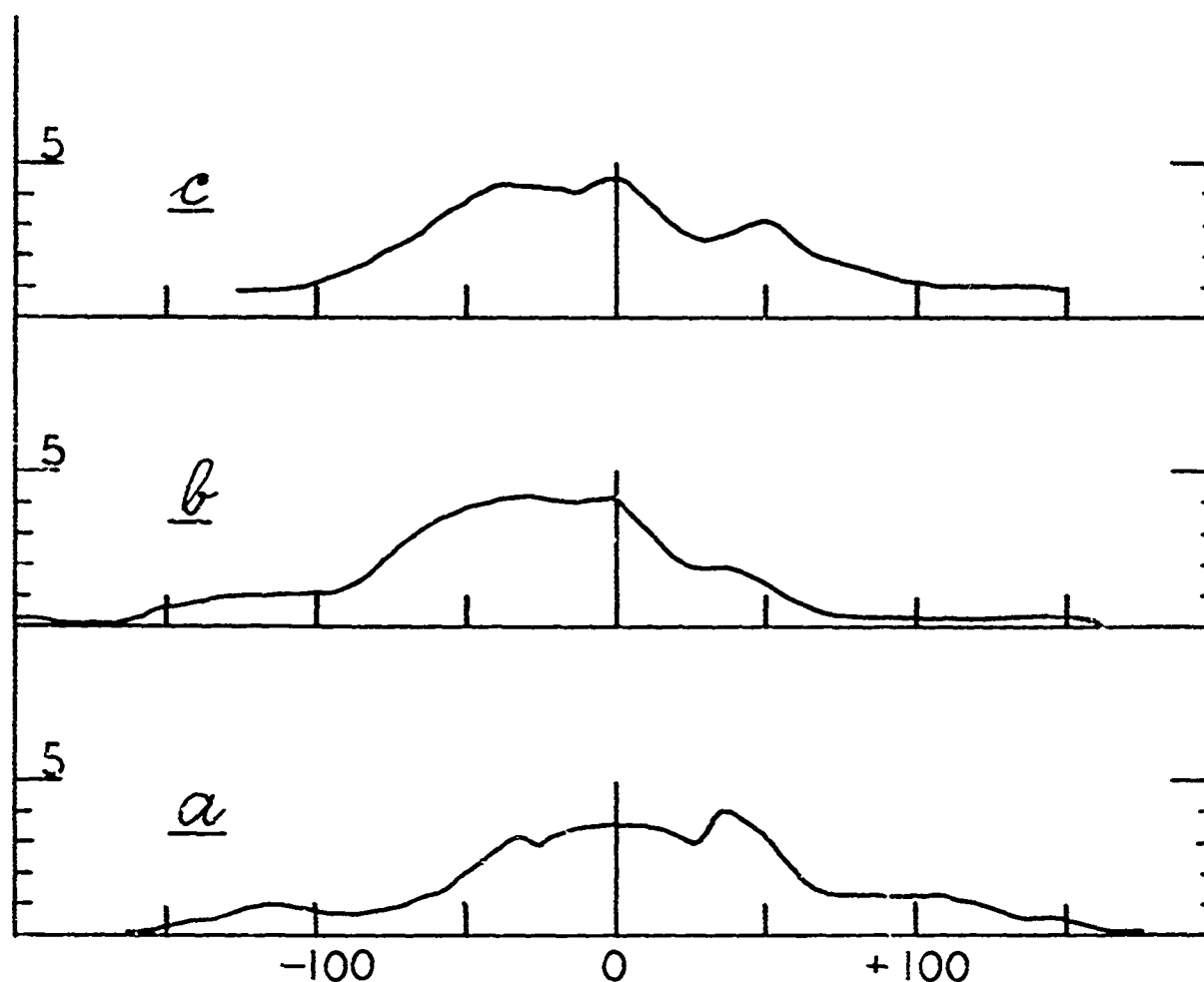


Fig. 6. Smoothed frequency distribution of velocity vector points along a, b, c axis.
Group 1, 3, 4 combined.
Abcissa - velocity in km/sec
Ordinate - frequency number

In Figures 6 and 7 the smoothed frequency distribution of the vector points along the axes a, b, and c is pictured. Group 2 and the Carbon stars include too few stars to show any definite trend. However, two other groupings with over one hundred stars in each show marked differences: the distributions in Figure 6 for the combined groups 1, 3, 4 with $P < 300$ days show much flatter and less definite maxima along all the axes than do the combined groups 5-8 in Figure 7 with $P > 300$ days.

VII Intercomparison of Space Velocities and Dispersions of Mira Variables with those of other Stars.

Besides Wilson and Merrill (1942) the space velocities of Mira variables have been studied by

P. G. Kulikovsky (1948), and V. S. Safronov (1955): Mira-type S stars by J. Ikaunieks (1950), and Carbon stars by J. Ikaunieks (1952) and K. Ishida (1960).

In some cases a direct comparison is easier since the same or similar procedures have been followed in the reductions. It is for this reason that the results by Kulikovsky, Safronov and Ikaunieks have been included among ours in Table VII. Our numerical values for the space velocities and dispersions agree satisfactorily with theirs except for the $\bar{a}$ component in which case our solution is about 30 km/sec larger for variables with periods less than 300 days and about 15 km/sec larger for those with periods more than 300 days. The exceptionally high absolute magnitude and the large space velocity of the second group,

TABLE VII
SPACE VELOCITIES AND THEIR DISPERSIONS OF MIRA VARIABLES

Grp	P	No. of Stars	Velocity in km/sec			Dispersion, km/sec		
			$\bar{a} \pm p. e.$	wt.	$\bar{b} \pm p. e.$	wt.	$\bar{\sigma}_1$	$\bar{\sigma}_2$
1	128	11	$+22.1 \pm 9$	0.6	-26.9 ± 9	0.3	-8.4 ± 9	± 46
2	174	24	$+64.2 \pm 11$		-103.7 ± 10		-26.3 ± 9	± 74
Safronov (1955)	167	7	$+34 \pm 56$		-86 ± 47		-7 ± 29	± 114
3	224	42	$+18.4 \pm 9$	0.6	-35.7 ± 8	0.4	$+7.7 \pm 7$	± 83
4	272	56	$+18.8 \pm 7$	1.0	-20.6 ± 5	1.0	-3.3 ± 5	± 82
Mean: 1+3+4	239	109	$+20 \pm 5$		-25 ± 4		-3 ± 4	± 79
Kulikovsky (1948)	93	93	-4		-13		-2	± 62
Safronov (1955)	237	36	-9 ± 11		-15 ± 7		$+3 \pm 7$	± 43
5	323	63	$+10.3 \pm 5$	1.0	-22.4 ± 4	1.0	-4.8 ± 3	± 54
6	375	37	-3.5 ± 5	1.0	-11.9 ± 6	0.5	-1.4 ± 4	± 42
7	419	19	$+14.7 \pm 5$	1.0	-13.3 ± 4	1.0	$+1.0 \pm 2$	± 42
8	512	12	$+16.3 \pm 8$	0.4	-6.2 ± 5	0.6	-1.0 ± 4	± 35
Mean: 5-8	369	131	$+8 \pm 3$		-15 ± 2		-2 ± 1	± 40
Kulikovsky (1948)	40	40	-12		-2		$+6$	± 47
Safronov (1955)	373	64	-5 ± 7		-5 ± 5		0 ± 5	± 28
C	405	24	$+5.1 \pm 7$		-12.1 ± 6		-6.2 ± 4	± 35
Ikaunicks (1952)	11	11	-11 ± 4		$+30 \pm 12$		-2	± 54
Sc	362	20	-3.4 ± 5		-7.2 ± 4		-12.0 ± 2	± 45
Ikaunicks (1950)	363	17	-5.1		-1.6		-9.6	± 29
								± 25
								± 42
								± 31
								± 43
								± 15
								± 20

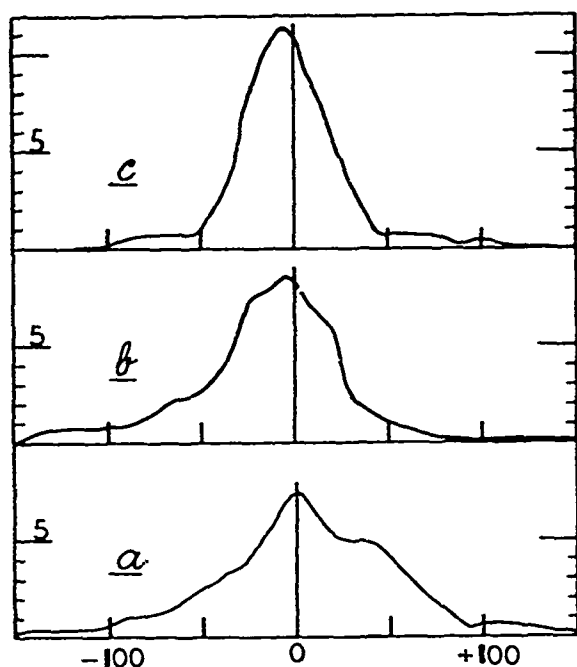


Fig. 7. The same as Fig. 6 except that this is for Groups 5 - 8.

149 < P < 200 days, remain as in previous studies. The large radial velocities in this group apparently cause these results.

It seems that the best comparison of our results with those of Wilson and Merrill (1952, Table 12) can be made for the group motions referred to the sun. For the stars with $P < 300$ days their value is 53.6 km/sec, and ours is 63.6 km/sec; for the stars with $P > 300$ days their value is 28.2 while ours is 31.8.

Ishida's (1960) $dV = +5.4$ km/sec for 32 Carbon stars is comparable with our b component which is -12.1 while Ikaunieks obtained $+30$ km/sec. The large scattering apparently is caused by the small number of stars in all 3 papers.

It is no surprise that for Se stars our results agree so well with Ikaunieks' (1952) results since 14 variables are common to these two determinations.

It is interesting to analyze our results in the way suggested to us by Dr. Vyssotsky, as outlined in his summarizing article (1957). The position of group 2 in the Haas-Bottlinger diagram (Figure 8) indicates the high eccentricity of the orbits described by the stars in this group. In addition, this group lags behind the galactic rotation much more than any other group. Further, the projections of the velocity-vector points on the galactic plane (Figures 2 and 3) indicate a high orbital inclination for variables with period < 300 days and a low inclination for those with $P > 300$ days.

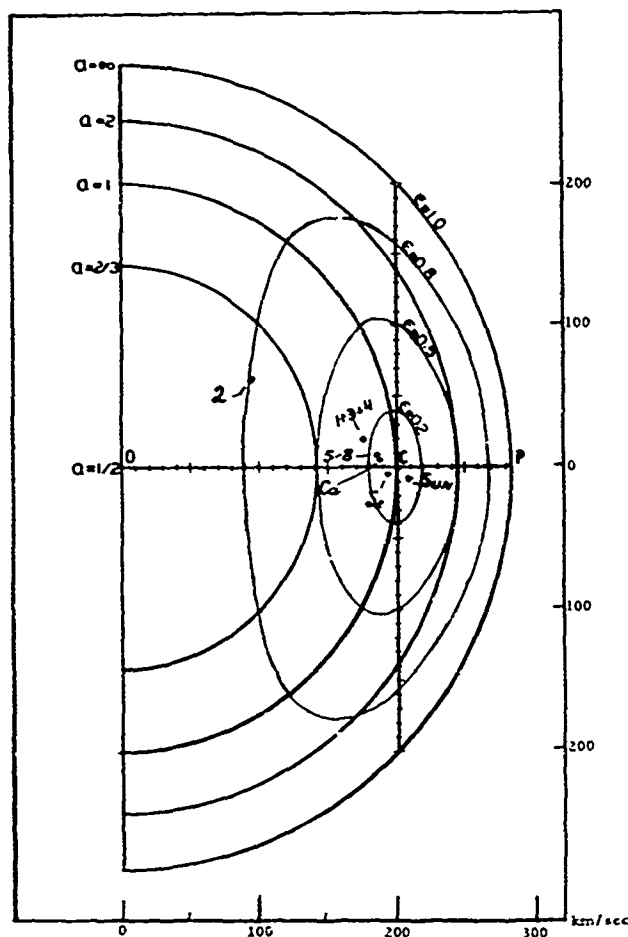


Fig. 8. The Haas-Bottlinger velocity-vector diagram. This diagram is in the galactic plane with the direction to the galactic center down and the direction of rotation to the right. The groups are the same as in Table VII.

Also, the deviation of the vertex from the direction to the galactic center and the smaller group velocity indicates that the variables with $P > 300$ days stay closer to the galactic plane. However, the division at 300 days is only an arbitrary one, since we do not know whether there is any sudden break in the periods of Mira variables whose orbital inclinations are high or low. A more definite answer to this might be sought in the spectra of variables with periods between say, 275 and 325 days. Another task is to affirm or disprove the large radial velocities in the 150-200 day period-group by selecting as many variables as possible with periods from the shortest ones up to 225 days and by determining their radial velocities.

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