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List of 333 variable, microvariable or suspected variable stars detected in the Geneva photometry

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Summary. — We draw your attention to a list of 333 stars which are not included in the GCVS and its supplements (Kukarkin *et al.*, 1974) and whose probability of variability is high to certain. It would be premature to establish a classification in either of the known categories of variables before a great deal of supplementary observations have revealed the individual characteristics of these stars. The standard deviations observed in the V magnitude together with the known spectral types only allow us to suspect the type of variable.

Key words : Variable stars — Microvariable stars — Suspected variable stars — Geneva photometry.

1. **Introduction.** — During the preparation of the « Third Catalogue of Stars measured in the Geneva Observatory Photometric System » (Rufener, 1981) more than 70 000 seven-colour measurements of 14 633 stars, i.e. an average of 4 to 5 measurements per star, had to be evaluated. Our usual observation procedure consists in measuring each star at least 3 times. We avoid making these 3 measurements within a short interval of time; one of them is usually separated from the other two by one year. This procedure increases the chance of detecting an instability and favours an overlapped intercomparison of these stars. Apart from the stars used as standards (some have already been measured several hundred times !) there are many which, due to various circumstances and reasons, have been observed more than 3 times. There is also a small number of stars in the catalogue which have not yet been measured 3 times, either for lack of time or opportunity, or because some of their measurements were of poor quality. For the definition of the P and Q numbers of good colour-index and V magnitude measurements, as well as their respective weighting, the calculation of the standard deviations of the colours (σ) and the V magnitude (σ_v), we refer to the forewords of Rufener's catalogues (1981, 1976). The dispersion of measurements of each star has been systematically examined so as to detect errors, inaccurate measurements due to momentaneously unfavourable atmospheric conditions, bad choice of the sky background, the neighbourhood of disturbing stars, etc. The corrections and the individual weighting of these measurements have been made taking into account all reasonable causes of scatter. The remaining unreducible deviations which appear in the numerical values assumed by the estimated standard deviations (σ and σ_v) lead to designate the stars as — certainly variable or microvariable, — probably variable or microvariable, — suspected variable, — or simply too faint or too difficult to measure satisfactorily so that the accuracy of their means reaches the general quality level of the catalogue. The differences of meaning of these appreciations have to be defined before we present our selection of variable or simply suspected variable objects. The amplitudes of the observed deviations as well as the number of measurements are the determinant factors.

2. **Statistical characteristics of the population of so-called normal and stable stars.** — For the most frequently measured stars in the Geneva photometric system, known as non-variable stars, the variance and covariance matrix of the 6 colours (colour indices relative to the B magnitude) and the V magnitude has been calculated.

These calculations have been applied to a sample of 168 stars distributed over the celestial sphere (91 stars with $\delta > 0$ and 77 stars with $\delta < 0$). These stars have an average number of good measurements close to 71 which constitutes a sub-set of about 14 000 measurements thus representing 20 % of all the measurements made in the Geneva system. The procedure for obtaining these typical values is described in the foreword of Rufener's catalogue (1981). The reader is referred to this text for more details on the use of these statistical values which characterize the population of the catalogue. Let us summarize by formulating the implicitly admitted hypothesis. The error

distributions over the individual measurements reflect a normal distribution. The one corresponding to the V magnitude measurements with a weight different from zero, is characterized by a standard deviation $s_v = 9.2 \times 10^{-3}$ mag. (The standard deviation of the error distribution in the colours is of $s = 6.5 \times 10^{-3}$ mag.)

These typical values can be considered to be independent of the V magnitude value as long as $V < 10.5$. They are the reflection of uncertainties resulting from the combined effect of inaccuracies of the measurement, of reduction outside the atmosphere and of the correlating to standard stars. The s_v of weak stars ($V > 10.5$) increases slowly with magnitude due to the growing importance of the statistical fluctuations of the flux (photon noise). To justify the hypothesis emitted above it is useful to recall that the error distribution varies little with respect to the weight attributed to each measurement when this weight differs from zero. Burki (1978) noticed this property by studying the distribution of the deviations from the mean value calculated for the most frequently measured star in the Geneva photometry (HD 77770).

How many good measurements are necessary, i.e. above which values of the quantities P and Q can the estimate of σ and σ_v obtained for a star be considered as significant ? An experimental reply to this question can be given by investigating for all non-variable stars of the Catalogue the variation of the mean ($\overline{\sigma}$) of the standard deviations observed on the colours and the mean ($\overline{\sigma_v}$) of the standard deviations on the V magnitudes. This variation as a function of the P and Q values is illustrated in figure 1. Note that when $P > 6$ and $Q > 5$, we already obtain, on the average, an estimation of σ and σ_v close to the typical values s and s_v. This statement confirms our choice of waiting until P or Q reach 6 before confirming the microvariability of a star which presents an observed σ larger or equal to 2.5 times the typical s. Another kind of statistical information can be gained from the histogram of the number of stars having a given σ or σ_v. Figure 2 represents the frequency of the considered σ_v in intervals of a thousandth of a magnitude for all stars of the catalogue with a number of measurements $Q \geqslant 3$.

This figure can be interpreted by means of a weighted combination of several χ^2 functions. The respective weights of the χ^2 functions with $(Q - 1)$ degrees of freedom reflect the frequency of the catalogue stars having Q measurements ($Q \geqslant 3$). It seems however useless to proceed to such a detailed study of figure 2; its significance would be somewhat limited by the hazards of the acquisition of the measurements. Indeed, the constancy in the distribution of the errors during 20 years of measurements, on various observing sites, using various photometers, is not certain. The way of calculating our estimations of σ and σ_v as well as the described weightings (Rufener, 1981) are also non negligible sources of modulation of the statistics. It seems preferable to propose a qualitative interpretation. For this purpose, figure 2 illustrates, in broken line, the χ^2 function with 2.3 degrees of freedom calculated for a population with a standard deviation of $s'_v = 8.2 \times 10^{-3}$ mag. It is the best compromise which correctly describes the general aspect of the experimental histogram. The good coincidence of the modal value of σ_v estimated equal to about 2/3 of the typical s_v of the population can be seen. The most important divergence can be detected at the tail of the experimental distribution, which cannot be explained by the distribution in χ^2. The variable and microvariable stars are represented in that part of the histogram. Also present are the effects of an experimental error of low amplitude (hence difficult to identify) for some stars which has escaped criticism and which increases the σ_v estimated for the mean value of the 3 or more measurements. A first remark has to be made on the value of the standard deviation ($s'_v = 8.2 \times 10^{-3}$ mag) which defines the best fit for this model : why is this value inferior to that obtained by analysing the sample of the most frequently measured stars ? It is well founded to put forward the fact that most of the estimated σ_v of the catalogue result from a sub-population whose duration of acquisition is very short with respect to 20 years of existence of the Geneva photometric system. Drifts, errors depending on right ascension, declination or magnitude concern very little the stars which have been measured 3 to 5 times and which represent in fact the majority of the stars in the catalogue. However, the sample of the 168 most measured stars, retained for evaluating the typical s_v of 9.2×10^{-3} mag certainly reflects better all the above-mentioned error sources.

A second remark can be made on the distribution of potentially variable or microvariable stars which can be obtained by subtracting the model-function in χ^2 from the experimental histogram in figure 2. This distribution is reproduced by the thin line in figure 2. It has no reason to present a maximum between 14 and 20×10^{-3} mag; if it were not constant, it would probably at least be monotonic. The contamination of the estimated standard deviations by a low percentage of small and undetected experimental errors is probably at the origin of this appearance. The justification of the choices we made for defining the criteria of selection of table I given in the following paragraph results from the above-invoked considerations.

3. **Criteria for distinguishing variable, microvariable or suspected variable stars.** — A star is naturally qualified as variable when repeated peak-to-peak variations exceeding 0.10 magnitude are recorded and the recurrence of these variations is admitted. This is generally the case when the estimated σ_v exceeds 3.5 to 4 times the typical s_v. If the recorded variations have the consequence of increasing the estimated σ_v by 1.5 to 3.5 times its typical s_v value, we are certainly faced by an anomaly, although it should be made sure that the estimation of σ_v is well representative. The nature of such variations is only revealed by the luminosity curve, that is to say by a large number of observations. As examples let us mention the 130 measurements of HD 13970 which present $\sigma_v = 0.024$ (Burki and Rufener, 1978) or the 160 measurements of HD 77320 with $\sigma_v = 0.025$ (Burki, Burnet and Rufener, 1980).

We have attempted to determine categories using the proposed criteria in table I. The stars satisfying criteria « a » are declared microvariables because the number of measurements as well as the value of σ_v are high enough to remove all causes of doubt. This conviction led in the column « REM » of the catalogue to the attribution of the letters VR, V for variable, R for a qualification mentioned in the enclosed notes. Criteria « b » allow the selection of stars whose number of measurements is sufficiently high for the estimation of σ_v to be significant and the numerical value of σ_v (between 1.5 and 2.5 times the typical s_v) allows to anticipate a highly probable microvariability. These

stars have been designated by the letter R in the « REM » column of the catalogue and in the enclosed notes they have been qualified as « possibly microvariable ». The type « c » criteria draw attention to suspected variables. The number of accurate measurements is insufficient to guarantee the estimation of σ_v. In some cases the detected deviations are so large that an enclosed note explicits the particular measurement; this is designated by R in the « REM » column of the catalogue. We probably have here some cases of eclipses recorded by chance. The difficulty of our critical discussion consists in evaluating these observations, some of which might have deserved disqualification. When among 3 or 4 measurements we have one presenting a difference in magnitude of several hundreds or tens, this might be due to a lack of attention of the observer who badly oriented the slit of the dome in front of the telescope. Each time, the probability of such a circumstance has been taken into account. The weight of these measurements has been set to zero when that probability seemed superior to 1/3. (This kind of subjective appreciation is based on the study of the sequence of observations framing the suspected measurement.) Some of the stars in the catalogue have not been retained for the list in table III although they satisfy to one of the « a, b or c » criteria. Their large magnitude and/or difficult observing conditions (low separation, variable sky background in the neighbourhood) have increased σ_v independently of their eventual intrinsic variability.

We hope that the above explanations guide the reader among the various nuances of the selection process, the intent of which seems simple, although the procedure of fixing the limits of each criterium is equally based on empirism as on rigorous statistical considerations.

In order to evaluate the efficiency of the empirical criteria proposed in table I we used the scheme elaborated by Burki (1978). Considering these variable stars to be periodically pulsating stars, with a sinusoidal or serrated variation of amplitude a, he assumes the errors of measurement and reduction to be normally distributed with a standard deviation s'_v of 8.2×10^{-3} mag. From these hypotheses, Burki calculates by means of a Monte Carlo process the probabilities of detecting the variability of a star for which the standard deviation σ_v of Q measurements made at random has been estimated. Reproduced in graphical form these probabilities allow the following deductions referring to the criteria of table I :

— The probability of detecting as a variable or suspected variable a star which is not, is very low.

— The smallest amplitude a of the variation which has a positive probability of being detected decreases with increasing Q. This has been verified for each category of criteria a, b or c. For $Q > 3$ the probability is positive for all the criteria as soon as $a/s'_v > 4$.

— The certainty of detection is acquired with criteria a and b provided the amplitude of variation is high. From the top to the bottom of table I, a/s'_v must exceed values scaled from 8 to 4. For the c criterium no certainty of detection exists as long as the amplitude is not high enough (20 to 100 s'_v).

It must be recalled that this analysis is based on the hypothesis of periodical variations of constantly variable amplitude. In the case of periodical or non-periodical variations whose amplitude is different from zero for a small fraction of time only, the criteria of table I have a much lower efficiency of detection.

Among the stars of Rufener's catalogue (1981), which are not mentioned as variables in the « General Catalogue of Variable Stars » (GCVS), 108 stars have been selected by criteria a and b. There are 225 which correspond to criteria c in table I. These 333 stars are listed in table III. The MK spectral types available for 83 % of them are from the BS, the Jaschek (1964), the Kennedy (1974) or the Buscombe (1977) catalogues. They made possible the inventory presented in table II. The proportion of stars belonging to a sub-category of spectral types in each of the two samples has been estimated therein. Note that criteria a and b filter stars whose distribution in the HR diagram confirms the existence of zones with high probability of variability such as those described by Maeder and Rufener (1972) and confirmed by Maeder (1980). Despite the higher uncertainty of selection presented by criterium c, note the very large similarity in the proportions deduced from the inventory of the two samples. This observation strengthens the credibility we have with respect to the selection operated with criterium c.

References

Burki, G. : 1978, Thèse Université de Genève.
Burki, G., Rufener, F. : 1978, *Astron. Astrophys.* **70**, 105.
Burki, G., Burnet, M., Rufener, F. : 1980, *I.B.V.S.*, 1820.
Buscombe, W. : 1977, M. K. *Spectral Classifications*, Evanston, USA.
Jaschek, C., Conde, H., Sierra, A. C. : 1964, *Publ. Astr. Univ. Nac. La Plata, ser. astr.* **28**, no 2.
Kennedy, P. M., Buscombe, W. : 1974, *M. K. Spectral Classifications*, Evanston, USA.
Kukarkin, B. V. *et al.* : 1969-1971, *General Catalogue of Variable Stars and its three suppl.* (third edition, Moscow).
Maeder, A. : 1980, *Astron. Astrophys.* **90**, 311.
Maeder, A., Rufener, F. : 1972, *Astron. Astrophys.* **20**, 437.
Rufener, F. : *Astron. Astrophys. Suppl. Ser.* **26**, 275.
Rufener, F. : 1981, *Astron. Astrophys. Suppl. Ser.* **45**, 207.

TABLE I. — *Definition of the criteria of microvariability.*

Number of good measures Q	Standard deviation for the V magnitude · 10^3		
	a	b	c
2			⩾40
3			⩾25
4- 5			⩾20
6-10	⩾23	⩾18 <23	
11-20	⩾18	⩾14 <18	
20	⩾14		

TABLE II. — *Inventory of the stars in table III according to their MK spectral types.*

Sub-categories of spectral types	Proportion in percent of the samples selected according to criteria	
	a & b	c
O, B and Be	22	26
Supergiants BAFG	27	17
Classes V and III as well as metallic-line AFG	16	13
BAF type p (peculiar) AFG classes IV and VI	10	10
All types K and M	25	34

TABLE III. — *List of 333 variable, microvariable or suspected variable stars detected in the Geneva photometry.*

The information contained in each column is identified by its heading. For the « membership » column, the same conventions as in Rufener's catalogue (1981) have been adopted. Let us specify that the first column SIG corresponds to σ_v expressed in a thousandths of a magnitude whereas the second column SIG stands for σ. The letter R in the column REM refers to comments added at the end of table III.

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	mV	P	SIG	U	V	B1	B2	V1	G
	8	166	0 1.4 28 29		K0V	VR	22	24	6.100	28	7	1.525	.023	1.155	1.247	-.783	1.036
	18	402	0 3.5 -18 -8		(M1)		3	37	6.010	3	3	3.232	-1.159	1.683	.970	-.333	-.311
		2491	0 23.5 -59-53		(G0)	R	2	139	9.827	2	6	1.372	.329	1.028	1.351	1.068	1.400
KAP CAS	130	2905	0 27.4 62 23		B0.7IA	VR	30	20	4.168	39	7	.424	.824	.822	1.564	1.535	1.981
			0 34.0 60 25	O-STARS 008	O9IV		3	30	10.724	3	14	1.597	.610	.938	1.442	1.338	1.737
57 PSC	211	4408	0 41.3 14 55		(GM4)		3	46	5.420	3	11	3.182	-1.082	1.546	1.017	-.284	-.138
		4913	0 46.1 18 11		(DK6)		3	28	9.221	2	15	2.335	-.546	1.484	1.033	.268	.281
SIG SCL	293	6178	0 57.7 -32 -6		A2V		4	62	5.524	3	4	1.564	.858	.917	1.465	1.551	2.030
		63.00137	1 .3 63 24		K7V	VR	44	14	8.991	50	11	2.367	-.676	1.489	1.026	.151	.132
	435	9184	1 25.3 -47-16		(M4)		3	44	6.216	3	5	3.219	-1.154	1.615	.987	-.346	-.243
	468	10052	1 33.1 -58-47		(M1)		4	31	6.174	4	6	3.200	-1.099	1.616	.977	-.291	-.184
		10436	1 36.7 63 22		K5V	VR	15	26	8.402	23	10	2.273	-.557	1.456	1.034	.255	.276
TAU CET	509	10700	1 39.4 -16-28		G8VP		5	21	3.503	5	11	1.400	.075	1.130	1.286	.834	1.092
	519	10934	1 42.2 -51-19		M3III		4	20	5.466	4	5	3.239	-1.092	1.661	.967	-.280	-.201
ALF TRI	544	11443	1 47.4 29 6		F6IV		4	22	3.429	5	4	1.368	.379	1.020	1.376	1.120	1.460
		11582	1 48.6 -34-46		(G0)		4	48	9.574	4	10	1.281	.149	1.043	1.338	.899	1.182
CHI ERI	566	11937	1 52.0 -52 -7		G5IV	D	3	27	3.747	3	3	1.674	-.105	1.199	1.239	.665	.910
		37.00442	1 54.0 38 10	NGC 0752 500	(O)	VR	43	16	10.006	66	11	.003	1.294	.739	1.647	1.973	2.521
		12399	1 56.5 63 46		G5IA	VR	6	48	7.495	7	28	2.909	-1.215	1.529	1.032	-.367	-.417
		12882	2 1.1 64 33		B6IA		2	44	7.597	2	5	.713	.542	.880	1.482	1.272	1.645
	618	12953	2 1.8 57 57		A1IA	VR	111	21	5.678	125	6	1.431	.243	.943	1.424	.993	1.274
	625	13215	2 4.0 -18-15		(M1)		4	28	6.090	4	9	3.251	-1.147	1.680	.962	-.326	-.274
5 PER	627	13267	2 4.7 57 11		B5IA	VR	27	18	6.370	39	7	.857	.596	.869	1.497	1.319	1.688
		13969	2 10.8 56 38	H PER 0339	B1IV		3	34	8.828	4	10	.628	.603	.827	1.479	1.325	1.694
		13970	2 10.8 56 11		B2V	VR	118	25	8.308	133	7	.572	.798	.838	1.532	1.506	1.934
		14134	2 12.1 56 40	H PER 1057	B3IA		3	30	6.525	3	7	.897	.423	.890	1.466	1.152	1.470
PI 1 HYI	667	14141	2 12.1 -68-19		(M0)		3	34	5.577	3	7	3.147	-1.010	1.635	.979	-.196	-.139
		14143	2 12.2 56 43	H PER 1162	B2IA		5	22	6.640	6	7	.786	.372	.885	1.456	1.108	1.423
		14162	2 12.4 56 41	H PER 1268	B0.5V		4	20	9.388	4	11	.751	.534	.883	1.501	1.258	1.622
		56.00559	2 14.2 56 51	CHI PER 1926	B1IIIE		2	129	9.897	1	16	.632	.416	.901	1.485	1.162	1.483
9 PER	685	14489	2 15.3 55 23		A2IA	VR	98	20	5.185	110	6	1.356	.537	.886	1.477	1.268	1.620
		14633	2 16.7 41 2		O8V	VR	49	25	7.462	77	8	.119	1.231	.758	1.631	1.915	2.457
		14956	2 19.6 57 14		B2IA	VR	101	22	7.192	110	6	.956	.125	.940	1.421	.874	1.151
	711	15152	2 21.4 26 33		(K5)	VR	34	21	6.136	49	9	3.018	-.898	1.627	.974	-.078	-.039
		15316	2 22.8 57 22		A3IB		4	23	7.198	6	7	2.187	.045	.972	1.378	.804	1.039
		15497	2 24.6 57 15		B6IA	VR	86	20	7.017	95	6	1.269	.053	.963	1.404	.810	1.056
	825	17378	2 42.2 56 40		A5IA	VR	131	17	6.251	153	7	2.269	-.086	1.000	1.371	.684	.884
		17971	2 48.2 59 59		F5IA	VR	82	14	7.717	89	8	2.530	-.309	1.119	1.276	.482	.604
		18391	2 52.2 57 16		G0IA	VR	48	14	6.978	52	12	3.080	-1.480	1.517	1.061	-.602	-.738
			3 3.5 47 52	ALF PER 0094	F9V		2	45	10.350	2	6	1.359	.170	1.060	1.335	.922	1.205
	1009	20797	3 16.0 64 14		M0II		2	52	5.217	3	6	3.567	-1.652	1.759	.954	-.788	-.884
	1035	21291	3 21.0 59 36		B9IA	D	3	31	4.202	5	5	1.156	.477	.900	1.478	1.219	1.548
		48.00923	3 21.3 48 35		F4V	D	4	28	9.694	3	10	1.321	.410	.993	1.374	1.140	1.482
	1090	22231	3 29.6 -50-43		K3III		3	31	5.679	3	7	2.240	-.429	1.371	1.098	.350	.521
	1099	22468	3 31.7 0 16		(G9)	DR	3	105	5.837	3	6	1.691	-.191	1.213	1.206	.583	.755
	1105	22649	3 33.5 62 54		S5.3	VR	7	35	5.152	R	9	3.162	-1.153	1.597	1.013	-.355	-.207
		23386	3 39.7 24 36	PLEI H 0739	G0V		3	26	9.483	3	7	1.317	.203	1.055	1.320	.949	1.243
	1191	24131	3 45.5 34 3		B0.5V	D	3	27	5.759	4	5	.436	.976	.809	1.568	1.677	2.155
OMI 1 ERI	1298	26574	4 7.0 -7 -6		F2III	R	16	15	4.045	17	6	1.531	.568	.973	1.400	1.287	1.675
		26857	4 9.7 50 37		(K2)		3	26	6.612	4	15	2.543	-1.204	1.526	1.028	-.354	-.401

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
		27257	4 13.2 50 1	NGC 1545 005	B3III	VR	20	19	9.231	37	9	1.155	.690	.876	1.471	1.395	1.807
		27277	4 13.5 50 2	NGC 1545 004	G6III	VR	20	24	8.092	37	11	1.852	-.264	1.210	1.186	.504	.703
		27292	4 13.5 50 1	NGC 1545 003	K5III	VR	80	29	7.151	122	11	2.992	-1.139	1.603	.984	-.306	-.308
56	TAU 1341	27309	4 13.6 21 32		A0P		4	22	5.357	3	8	.938	1.122	.836	1.541	1.831	2.305
	1345	27362	4 14.0 -20-57		(M4)		4	63	6.067	4	15	3.158	-1.145	1.536	1.028	-.344	-.208
	1362	27536	4 15.7 -6-29		(G5)	VR	6	33	6.260	5	6	1.785	-.168	1.226	1.196	.596	.810
		27598	4 16.2 -17 -4		M5III		3	37	7.081	3	5	3.261	-1.171	1.594	.990	-.370	-.251
	1398	28143	4 21.2 -34-58		(F5)		3	25	6.555	3	5	1.427	.431	1.001	1.374	1.162	1.517
	1429	28552	4 24.9 -42-11		(M1)		3	43	6.417	3	10	3.204	-1.109	1.649	.976	-.292	-.239
		29159	4 30.4 15 28	HYADES B 099	K1V		3	25	9.366	3	7	1.743	-.110	1.243	1.198	.667	.870
		29574	4 34.3 -13-32		(K0)		5	22	8.353	6	11	2.517	-.785	1.347	1.127	.024	.093
56	ERI 1508	30076	4 39.3 -8-41		B2VE		3	35	5.890	5	7	.391	1.065	.797	1.585	1.758	2.261
58	ERI 1532	30495	4 43.1 -17 -7		(G0)		5	22	5.483	6	7	1.350	.184	1.082	1.312	.932	1.222
4	AUR 1592	31647	4 52.5 37 44		A0V	D	5	27	4.929	6	6	1.441	.904	.899	1.474	1.596	2.088
		32190	4 56.2 23 53		B1VE		2	41	8.370	2	5	.527	.810	.828	1.529	1.516	1.950
105	TAU 1660	32991	5 2.0 21 34		B2VE		4	25	5.964	3	8	.669	.780	.853	1.526	1.491	1.920
LAM	ERI 1679	33328	5 4.4 -8-53		B2IV	VR	6	38	4.213	6	9	.314	1.190	.773	1.617	1.879	2.424
	1738	34557	5 13.3 40 59		A3V		2	40	5.506	3	8	1.579	.802	.914	1.459	1.511	1.969
	1753	34798	5 14.9 -18-37		B3V		5	23	6.361	6	6	.678	1.137	.812	1.579	1.822	2.360
		34921	5 15.9 37 35		B0IVPE	VR	16	40	7.377	24	11	.372	.724	.830	1.531	1.437	1.837
	1761	34959	5 16.1 3 54		B5VP		3	38	6.521	3	10	.823	1.084	.806	1.568	1.777	2.299
	1772	35165	5 17.7 -34-26		(B5P)	VR	78	24	6.060	72	7	.541	1.185	.786	1.601	1.873	2.417
120	TAU 1858	36576	5 27.6 18 29		B2IV-VE		4	35	5.531	3	11	.401	.911	.822	1.555	1.615	2.078
		36619	5 28.0 -23-30		(A5)	VR	124	14	7.756	141	6	1.572	.737	.952	1.423	1.444	1.883
			5 30.2 -6 -3	ORION CLOSOB	B9V		3	26	8.719	2	5	1.087	1.040	.841	1.544	1.725	2.243
		37001	5 30.3 -6-38		(B8V)	R	14	14	8.866	13	6	1.146	1.008	.855	1.522	1.703	2.205
43	ORI	37041	5 30.5 -5-29	ORION CLO682	09.5VPE	B	4	27	5.047	6	8	.248	1.076	.793	1.609	1.782	2.267
		290750	5 33.0 -1 -5	RING ORI 014	A5V		4	22	9.855	4	9	1.522	.732	.945	1.425	1.443	1.869
		39680	5 49.0 13 49		O6PE		5	23	7.868	4	6	.180	.907	.800	1.568	1.611	2.049
THE	AUR 2095	40312	5 52.9 37 12		B9.5VP	D	3	29	2.636	3	7	1.329	1.063	.849	1.551	1.767	2.256
CHI 2	ORI 2135	41117	5 58.0 20 8		B2IA	VR	28	22	4.629	31	6	.545	.641	.846	1.526	1.362	1.764
		251383	5 59.7 26 34		K2V		5	31	9.425	5	8	1.753	-.161	1.249	1.162	.606	.786
		252199	6 2.5 24 26	NGC 2168 009	A0V		5	34	9.919	4	9	1.199	.730	.871	1.465	1.419	1.855
		252319	6 3.1 24 22	NGC 2168 007	A0V		5	22	9.383	6	8	1.361	.759	.865	1.465	1.457	1.886
3	GEM 2173	42087	6 3.7 23 8		B2.5IB	VR	22	21	5.742	27	6	.610	.725	.842	1.525	1.438	1.859
	2208	42807	6 7.7 10 40		G8V		3	25	6.663	3	6	1.371	.136	1.103	1.292	.886	1.170
	2370	45995A	6 25.6 11 19		B2VNNE		2	99	6.076	4	18	.355	1.071	.794	1.583	1.765	2.306
		46105	6 26.3 5 50		A1P	D	3	41	7.115	2	6	1.210	.985	.870	1.524	1.689	2.179
		46202	6 26.9 5 3	NGC 2244 006	O9V	VR	6	24	8.197	6	8	.478	.768	.834	1.525	1.471	1.899
		46223	6 27.0 4 53	NGC 2244 003	O5	R	5	27	7.291	5	12	.420	.726	.834	1.526	1.439	1.849
	2384	46273	6 27.4 -50-10		(F2)	R	2	270	5.506	2	9	1.374	.516	.980	1.400	1.240	1.616
		46282	6 27.4 -7-14		(B9)	R	2	204	8.434	2	11	1.265	.964	.868	1.509	1.665	2.160
		47147	6 32.0 -45-13		(A5)		4	56	9.150	5	15	1.446	.499	.926	1.432	1.222	1.583
		261810	6 35.2 9 52	NGC 2264 088	B5V	VR	7	26	9.020	6	9	.633	1.064	.812	1.547	1.747	2.257
EPS	GEM 2473	48329	6 37.9 25 14		G8IB	VR	14	19	3.034	19	7	2.642	-.825	1.524	1.043	-.005	.099
	2501	49131	6 41.8 -30-51		B3V	R	3	161	5.683	3	16	.322	1.164	.779	1.601	1.852	2.375
	2507	49319	6 42.7 -39-26		(B8)		3	28	6.493	3	5	.750	1.098	.811	1.566	1.781	2.305
	2510	49336	6 42.8 -37-41		B3V	VR	119	43	6.190	130	10	.676	1.111	.801	1.581	1.800	2.321
KAP	CMA 2538	50013	6 46.1 -32-23		B2VE		3	71	3.588	3	8	.157	1.094	.785	1.601	1.793	2.299
		50064	6 46.4 0 25		B6IA		3	33	8.180	2	7	.948	.049	.948	1.411	.807	1.035

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
		.01659	6 46.6 0 36	NGC 2301 002	B9III	VR	11	24	9.014	10	9	.942	1.038	.829	1.551	1.745	2.216
	2567	50648	6 49.0 -26-50		(M4)		2	42	6.450	3	13	2.921	-.980	1.328	1.132	-.185	.001
	2627	52382	6 55.9 -9 -4		B1IB		3	39	6.467	5	6	.502	.739	.838	1.532	1.452	1.868
	2747	56031	7 10.3 8 10		(M4)		3	35	5.807	3	5	3.129	-1.051	1.558	1.001	-.249	-.102
		58640	7 21.4 48 8		(M8)		3	31	6.690	3	7	3.067	-.980	1.453	1.044	-.194	-.019
		59114	7 23.4 -15-11		O7		3	33	9.402	3	7	.656	.421	.898	1.469	1.153	1.468
		60941	7 31.8 -14-22	NGC 2422 062	A0V	R	19	16	9.146	18	6	1.367	.868	.892	1.491	1.572	2.029
	-14.02015	7 31.9 -14-16	NGC 2422 070	A0V	R	10	18	9.453	9	7	1.348	.933	.876	1.512	1.629	2.116
	2965	61885	7 36.3 13 44		(M1)		6	18	5.784	6	10	3.319	-1.150	1.697	.957	-.324	-.284
		62301	7 38.2 39 50		F8V		4	23	6.750	4	9	1.184	.319	1.001	1.358	1.047	1.366
		62857	7 40.9 26 16		G5IV		5	20	8.524	5	6	1.450	.113	1.115	1.277	.863	1.141
		63066	7 41.9 -4-42		(G0)		4	22	9.091	4	8	1.348	.159	1.065	1.321	.912	1.201
	3026	63302	7 43.1 -15-44		G8IAB		3	53	6.395	3	10	3.123	-1.324	1.674	.981	-.493	-.501
	3103	65241	7 52.7 7 29		A0V		2	42	6.450	2	2	1.366	.983	.867	1.506	1.680	2.183
	-60.00951	7 55.6 -60-18	NGC 2516 101	---		R	13	15	10.189	15	11	1.567	.738	.931	1.446	1.445	1.889
	-60.00954	7 55.8 -60-34	NGC 2516 040	---		R	6	19	9.908	7	8	1.574	.714	.928	1.442	1.425	1.855
	-60.00978	7 56.4 -60-32	NGC 2516 127	A0P		R	17	16	8.918	16	11	1.109	.869	.871	1.496	1.576	2.018
	-60.00981	7 56.5 -60-35	NGC 2516 038	---		R	11	17	9.512	12	8	1.560	.713	.947	1.436	1.423	1.858
	3147	66194	7 57.2 -60-33	NGC 2516 134	B2VNE	R	6	22	5.818	6	6	.495	1.074	.793	1.576	1.761	2.271
	3153	66342	7 57.9 -60-19	NGC 2516 110	M1II		5	37	5.195	5	42	3.176	-1.283	1.685	.960	-.451	-.451
	-60.01026	7 58.5 -60-45	NGC 2516 031	---			3	25	10.409	3	9	1.477	.520	.976	1.404	1.243	1.619
19	PUP 3211	68290	8 6.6 -12-37		K0III	RD	15	17	4.725	15	6	1.907	-.212	1.262	1.179	.555	.776
		70516	8 17.3 45 17	LDS 0904 A	(G0)		4	23	7.709	4	8	1.367	.157	1.081	1.283	.903	1.192
	3337	71663	8 23.5 -2-11		A5M	D	4	29	6.418	5	8	1.431	.563	.973	1.404	1.282	1.673
	3364	72268	8 26.7 -36-23		(K2)		3	73	6.847	3	12	3.416	-1.530	1.646	.988	-.694	-.698
	3456	74371	8 38.5 -45 -3		B6IA		4	21	5.194	4	4	.816	.726	.850	1.519	1.449	1.855
	3494	75149	8 43.1 -45-32		B4IA		2	50	5.432	2	4	.731	.643	.854	1.519	1.365	1.764
		75860	8 47.4 -43-23		B1.5IAB		3	29	7.584	2	3	.944	.102	.938	1.406	.864	1.085
	3593	77320	8 56.7 -42-47		B2.5VN	VR	160	25	6.041	174	7	.436	1.152	.783	1.596	1.838	2.368
		77581	8 58.3 -40-10		B0.5IB	VR	15	31	6.876	15	7	.692	.394	.890	1.470	1.130	1.452
		79211	9 7.7 53 7		M0V		4	25	7.767	4	6	2.379	-.802	1.461	1.022	.027	-.012
		79210	9 7.7 53 7		M0V	R	4	29	7.666	4	6	2.387	-.791	1.473	1.019	.041	.004
		233622	9 14.7 50 31		(B0)		5	23	9.948	7	8	.397	1.195	.767	1.599	1.877	2.409
		80715	9 16.2 40 40		K2V		4	35	7.720	3	7	1.925	-.297	1.298	1.126	.482	.604
	-25.07160	9 19.8 -25-49	OS IV C 020	(GP)			3	25	10.130	3	29	2.396	-.738	1.348	1.130	.060	.165
		82309	9 26.1 20 26		K3III		3	31	7.423	3	4	2.660	-.669	1.492	1.016	.129	.212
KAP	HYA 3849	83754	9 35.5 -13-53		B5V	VR	11	20	5.056	13	10	.727	1.140	.811	1.576	1.824	2.362
	3870	84335	9 39.5 57 35		(GM3)		3	36	5.147	3	9	3.221	-1.086	1.601	1.003	-.285	-.157
	3872	84400	9 39.9 -50-46		(B8)	D	3	73	6.202	3	6	.856	1.081	.817	1.558	1.770	2.286
		85162	9 44.9 31 52		M2III		2	45	7.086	2	9	3.212	-1.148	1.637	.963	-.351	-.279
		86214	9 51.9 -59-21		B2IB		4	20	9.224	4	11	.408	.968	.805	1.564	1.664	2.142
		88230	10 5.4 49 58		K7V	VR	31	34	6.581	40	9	2.418	-.748	1.504	1.008	.081	.051
	3997	88351	10 6.1 -81 -4		(G5)		4	20	6.628	3	6	1.767	-.182	1.216	1.203	.578	.800
	4007	88647	10 8.2 -58-20		(M4)		4	52	6.184	4	12	3.228	-1.184	1.586	.997	-.373	-.264
ZET	LEO 4031	89025	10 11.1 23 55		F0III	VR	6	24	3.436	8	5	1.678	.587	.969	1.414	1.309	1.703
	4045	89273	10 12.8 -50-42		(M5)		3	69	6.236	3	7	2.955	-.985	1.389	1.100	-.192	-.013
	4049	89353	10 13.5 -28-30		(B9)	VR	8	75	5.408	8	12	2.057	.658	.891	1.464	1.374	1.780
	4076	89911	10 17.4 -19-22	RING HYD 014	A1V		4	20	6.110	4	10	1.550	.911	.882	1.472	1.609	2.095
	4084	90089	10 18.9 83 4		F5IV	VR	35	18	5.255	39	8	1.242	.498	.977	1.403	1.225	1.598
	4086	90132	10 19.1 -37-31		(A4)	R	2	88	5.368	3	5	1.474	.670	.942	1.426	1.380	1.804

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
		90313	10 20.4 -59 -1		B1IB		4	21	8.359	4	6	.633	.590	.863	1.498	1.310	1.697
		90948	10 24.8 -66-52		(60)		4	20	8.384	3	5	1.246	.285	1.031	1.350	1.017	1.329
RHO	LEO 4133	91316	10 27.6 9 49		B1IAB	RD	14	16	3.869	22	6	.273	1.147	.779	1.619	1.840	2.368
	4173	92287	10 34.2 -56-44		B3III		4	23	5.876	3	3	.655	1.115	.807	1.579	1.808	2.329
		29.02091	10 41.9 28 58		---		3	30	10.255	3	8	1.002	.342	.941	1.369	1.072	1.389
	4221	93563	10 42.9 -56-14		(B8)		5	24	5.154	5	6	1.084	1.054	.817	1.558	1.749	2.253
		94304	10 47.9 -57-53		B8IA		3	33	6.872	3	5	1.042	.395	.889	1.459	1.123	1.470
4R	LMI 4254	94480	10 49.3 26 1		A8V		4	20	6.192	3	3	1.580	.601	.970	1.398	1.318	1.714
		95589	10 56.8 -61-52		O7		3	25	9.620	3	13	.454	.666	.850	1.518	1.379	1.772
		95645	10 57.2 -60-43		B3IB		3	27	9.317	3	4	1.086	.926	.852	1.514	1.621	2.105
		303743	11 .5 -58-25	NGC 3532 050	(A2)		3	31	10.652	3	10	1.525	.635	.952	1.401	1.335	1.751
CHI 2	HYA 4317	96314	11 1.1 -26-45		(B9)	R	3	114	5.728	3	4	1.187	1.043	.830	1.550	1.731	2.245
		-58.03101	11 1.9 -58-13	NGC 3532 138	AM		3	61	10.393	3	7	1.541	.715	.952	1.430	1.419	1.844
		-58.03106	11 2.1 -58-12	NGC 3532 148	A1V		3	28	9.740	3	8	1.542	.817	.917	1.466	1.530	1.997
		303813	11 4.0 -58 -9	NGC 3532 226	A0P	VR	15	23	10.511	15	12	1.023	.938	.848	1.532	1.641	2.106
	4337	96918	11 4.4 -58-26		G0IA	B	3	28	3.928	3	12	2.376	-.608	1.369	1.132	.197	.295
		97859	11 10.3 5 30		(B6)	R	9	20	9.334	9	8	.764	1.088	.809	1.539	1.771	2.278
NU	UMA 4377	98262	11 13.2 33 38		K3III	VR	13	23	3.510	21	10	2.744	-.821	1.553	1.027	.004	.075
		98457	11 14.5 -29-47		A0P		3	30	7.944	3	14	1.059	1.048	.842	1.538	1.747	2.232
	4420	99712	11 23.1 -34-46		(K2)		3	38	6.450	3	7	3.166	-1.077	1.684	.951	-.263	-.241
	4445	100307	11 27.4 -26-11		(M1)		3	28	6.178	3	5	3.243	-1.153	1.658	.958	-.335	-.265
		100943	11 31.9 -61 -6		B5I	R	3	76	7.077	2	6	.666	.840	.832	1.534	1.542	1.980
	4491	101370	11 34.8 -16 -4		(M2)		3	26	6.213	3	7	3.170	-1.099	1.583	.995	-.296	-.176
		105004	12 .3 -26 -1		(F8)		2	46	10.189	2	12	1.185	.275	1.015	1.364	1.006	1.314
		105056	12 .6 -69 -1		B0IA		3	29	7.365	3	7	.312	.896	.807	1.548	1.598	2.039
DEL	CEN 4621	105435	12 3.2 -50-10		B2IVNE	VR	6	35	2.539	7	7	.312	1.127	.791	1.599	1.817	2.328
		106204	12 8.0 -65 -3		B9P		3	28	8.619	2	9	1.132	.989	.840	1.530	1.686	2.155
DEL	UMA 4660	106591	12 10.5 57 35		A3V	R	19	16	3.309	31	9	1.563	.860	.922	1.477	1.565	2.043
	4677	106975	12 13.0 -3-23		F3V		3	28	6.966	3	5	1.290	.493	.991	1.394	1.223	1.589
		107877	12 18.7 27 33	COMA TR 101	F5V	VR	12	18	8.363	13	8	1.225	.418	.988	1.364	1.145	1.496
		108170	12 20.4 -61-41		O9.5IA		3	26	8.676	3	6	.600	.507	.877	1.493	1.241	1.579
	4729	108250	12 21.0 -62-34		B4IV	VR	6	25	4.817	6	5	.645	1.138	.807	1.580	1.828	2.362
	4739	108396	12 22.0 -58-26		(M4)		3	61	5.427	3	12	2.994	-.984	1.411	1.086	-.196	-.004
		25.02511	12 24.7 25 4	COMA TR 150	G9V	VR	6	43	9.712	7	14	1.486	-.001	1.146	1.243	.751	.987
GAM	CRU 4763	108903	12 25.6 -56-33		M3II		2	51	1.622	2	9	3.227	-1.039	1.608	.992	-.253	-.111
	4807	109896	12 33.3 2 25		(M3)	R	6	22	5.714	5	11	3.152	-1.048	1.601	.984	-.249	-.126
	4822	110318	12 36.1 -12-28		(F6)	R	3	70	5.151	3	3	1.429	.437	1.001	1.380	1.167	1.515
		111503	12 44.6 -45-38		(F8)		3	53	9.541	3	7	1.339	.350	1.008	1.373	1.090	1.428
		111631	12 45.6 0-13		M0.5V		5	30	8.499	5	9	2.444	-.803	1.512	1.013	.027	-.012
		-59.04540	12 47.6 -59-52	NGC 4755 008	---		2	52	9.902	3	10	.568	.739	.853	1.521	1.456	1.875
KAP	CRU 4890	111973	12 47.9 -59-50	NGC 4755 002	B3IA		4	34	5.953	4	7	.679	.697	.848	1.521	1.405	1.818
		-59.04546	12 47.9 -59-51	NGC 4755 417	B2IVNE		2	47	9.927	3	9	.524	.785	.833	1.523	1.484	1.902
		-59.04559	12 47.9 -59-51	NGC 4755 004	M2IAB		2	49	7.606	2	25	3.207	-1.779	1.672	.975	-.925	-1.001
	4912	112374	12 51.1 -25-55		(CF6)	VR	19	101	6.895	19	35	2.088	.011	1.097	1.294	.768	1.015
	4930	113120	12 56.3 -70-56		B1V		3	29	6.171	3	6	.400	1.019	.797	1.584	1.719	2.209
	4938	113523	12 59.2 -40-39		(M4)		3	28	6.229	3	10	3.178	-1.148	1.624	.974	-.339	-.257
	4939	113602	12 59.7 -51-35		(M1)		3	39	6.431	3	5	3.292	-1.187	1.680	.963	-.361	-.332
		-63.02544	13 1.4 -63-40		B0.5IAB		3	33	9.977	3	10	.761	.426	.899	1.472	1.155	1.499
	4975	114529	13 6.0 -59-23		B8V	VR	185	48	4.563	183	6	.920	1.059	.829	1.544	1.745	2.259
		115071	13 9.6 -62 -3		O9.0VN		3	29	7.940	3	4	.490	.688	.837	1.523	1.409	1.799

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
		-61.03549	13 10.0 -62 -2		O9.0III		3	39	10.183	2	9	1.090	-.319	1.003	1.360	.473	.600
	5005	115308	13 11.3 0-52		(F0)		3	26	6.691	4	4	1.492	.591	.949	1.412	1.306	1.692
		115473	13 12.2 -57-37		WC6		3	41	9.124	3	19	.861	.652	1.337	1.094	1.604	1.116
	5027	115842	13 14.6 -55-17		B0.5IAB		3	28	6.034	3	3	.511	.639	.842	1.525	1.350	1.741
	5039	116226	13 17.1 -48 -2		B7IV		4	22	6.374	4	5	.919	1.054	.817	1.565	1.738	2.256
		116858	13 21.3 -23-46		K3V		3	33	8.747	3	9	1.802	-.187	1.287	1.167	.593	.759
		119392	13 37.9 23 50		(MA)		3	27	7.342	3	10	3.150	-.980	1.568	.995	-.187	-.051
		120678	13 45.8 -62-14		OPE		2	49	7.881	3	11	.204	.814	.804	1.546	1.518	1.934
		120955B	13 47.5 -31-26		---		2	47	8.323	2	13	1.266	.706	.929	1.438	1.413	1.832
		121678	13 51.7 -56-17		G3V		3	27	9.054	3	4	1.271	.197	1.040	1.335	.941	1.243
		121849	13 52.8 -33-30		G5V	R	6	21	8.135	6	4	1.354	.116	1.099	1.291	.864	1.142
		122132	13 54.8 47 6		M2III	VR	15	26	7.007	27	11	3.242	-1.118	1.679	.949	-.300	-.259
		126307	14 19.6 27 53		K4III		3	32	6.404	2	13	3.141	-1.071	1.638	.970	-.248	-.225
		128165	14 30.4 53 20		K3V	R	7	21	7.251	14	8	1.987	-.300	1.342	1.109	.488	.607
		128220	14 30.6 19 39		OP	VR	33	17	8.471	43	10	.376	.660	.852	1.491	1.385	1.746
		129929	14 40.2 -36-48		B3V	VR	75	19	8.066	73	5	.333	1.181	.778	1.605	1.863	2.402
ZET	CIR 5539	131058	14 46.3 -65-35		B3VN		3	38	6.105	2	4	.675	1.041	.809	1.564	1.738	2.254
THE	CIR 5551	131492	14 48.7 -62-22		B4VNP	D	3	25	5.466	2	3	.626	1.017	.813	1.559	1.708	2.214
		132910	14 56.6 54 15		(F0)		5	22	6.852	5	8	1.434	.580	.962	1.412	1.305	1.699
GAM	UMI 5735	137422	15 20.9 72 11		A3II-III	B	5	22	3.045	7	7	1.803	.902	.881	1.517	1.610	2.075
		-33.10593	15 28.0 -33-36		(F)		3	30	9.530	3	3	1.181	.348	.997	1.376	1.086	1.419
ALF	SER 5854	140573	15 39.3 6 44		K2III	R	19	14	2.649	20	7	2.461	-.516	1.439	1.072	.275	.427
BET	SER 5867	141003	15 41.6 15 44		A3V	RD	13	16	3.659	12	6	1.598	.869	.907	1.477	1.568	2.047
	5934	142883	15 51.9 -20-41		B3V		5	30	5.832	5	4	.773	.936	.841	1.533	1.632	2.107
		143309	15 54.5 -60 -3	NGC 6025 012	(B8)	VR	12	24	9.246	12	8	.950	.927	.847	1.531	1.629	2.097
		143413	15 55.0 -60-12	NGC 6025 003	B7IV	VR	27	14	8.382	25	6	1.059	.902	.840	1.532	1.600	2.061
	6055	146003	16 8.9 -53-34		(M2)		3	33	5.447	3	11	3.262	-1.214	1.659	.974	-.393	-.337
		146919	16 13.6 -52-48		B0.5I		3	29	8.540	3	7	.744	.331	.912	1.446	1.055	1.362
		149019	16 26.9 -49-33		A1IA	VR	48	18	7.390	48	5	1.638	-.102	.987	1.379	.668	.856
		151121	16 40.3 23 59	NPL 043+37.1	---	R	2	57	10.147	4	17	.436	.669	.783	1.905	2.688	2.712
		151288	16 41.4 33 40		K7V	VR	8	37	8.081	10	10	2.437	-.755	1.509	.998	.078	.049
		151986	16 45.6 -41-12		B9P	D	3	30	9.564	3	7	.722	.856	.845	1.524	1.548	2.011
	6262	152236	16 47.0 -42-12		B1IAE	VR	35	29	4.724	33	5	.660	.377	.894	1.467	1.115	1.427
		-41.11030	16 47.0 -41-40	NGC 6231 272	B1V		3	38	9.493	3	4	.546	.796	.832	1.534	1.504	1.934
		-41.11042	16 47.3 -41-39	NGC 6231 224	O8V	B	3	52	8.253	3	4	.503	.701	.846	1.515	1.415	1.804
		152291	16 47.4 -40-29		(B8)		3	30	8.809	3	6	.358	.837	.815	1.560	1.545	1.973
		152623	16 49.3 -40-31		O8V		3	28	6.692	3	5	.362	.846	.821	1.552	1.551	1.987
		152728	16 49.9 -55-58		(M)	R	3	169	10.110	3	103	3.667	-1.292	1.522	1.013	-.476	-.370
	6337	154143	16 58.6 14 14		M3III		4	25	5.001	3	6	3.203	-1.084	1.651	.960	-.268	-.197
ETA	SCO 6380	155203	17 5.0 -43 -6		F0IV-N	VR	29	14	3.314	27	5	1.477	.467	.991	1.387	1.196	1.555
	6522	158741	17 25.8 -34-12		(F2)	R	7	19	6.126	7	5	1.554	.522	.985	1.396	1.247	1.615
		160124	17 33.1 -32-16	NGC 6405 100	B5V		4	33	7.171	3	9	.852	.945	.841	1.542	1.644	2.115
		-32.13109	17 33.7 -32 -9	NGC 6405 047	---		2	47	10.438	2	14	1.572	.735	.951	1.446	1.430	1.871
		160529	17 35.3 -33-27		A2IA		5	72	6.534	4	20	1.871	-.527	1.071	1.292	.280	.329
		161677	17 41.8 5 49	IC 4665 073	B6V	B	3	25	7.100	4	5	.850	.945	.827	1.536	1.635	2.122
	6621	161756	17 42.2 -26-57		B3IV		3	35	6.314	3	5	.862	.813	.845	1.517	1.516	1.957
		161796	17 42.5 50 5		F3IAB	VR	17	37	7.027	18	15	2.203	.416	.975	1.385	1.144	1.480
		161817	17 42.6 25 48		A2VI	VR	17	24	6.970	32	8	1.692	.764	.902	1.471	1.475	1.908
		320769	17 45.2 -35 -1	NGC 6475 011	(F5)		3	29	10.219	3	10	1.263	.411	.995	1.380	1.135	1.487
		320754	17 45.5 -34-38	NGC 6475 025	(B9)		4	21	9.985	3	10	1.697	.663	.947	1.438	1.363	1.781

NAME	BS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
	6663	162725	17 47.3 -34-48	NGC 6475 088	B9P		16	14	6.402	15	9	1.424	.961	.857	1.515	1.663	2.123
		320870	17 48.6 -34-54	NGC 6475 147	(A5)		3	25	10.413	3	9	1.694	.720	.929	1.442	1.434	1.852
		164546	17 56.5 -45-10		(B9)		5	20	7.783	4	5	1.210	.993	.840	1.540	1.682	2.171
		167971	18 12.5 -12-17		O8F		2	48	7.435	3	5	.847	.066	.951	1.406	.832	1.049
DEL	SGR 6859	168454	18 14.6 -29-52		K2III	RD	20	16	2.712	21	7	2.756	-.797	1.557	1.018	.010	.104
	6861	168574	18 15.3 -24-58		(M5)		3	67	6.124	3	9	3.410	-1.490	1.571	1.010	-.650	-.621
		168607	18 15.5 -16-25		B9IAP		4	44	8.179	4	7	1.700	-.908	1.131	1.264	-.082	-.093
		168625	18 15.6 -16-25		B8IA		4	33	8.359	4	4	1.641	-.729	1.088	1.283	.081	.124
	6873	168797	18 16.6 5 24		B3VE		3	26	6.130	3	5	.671	1.000	.817	1.563	1.693	2.181
		168814	18 16.6 -14-26		A2IB		3	29	7.118	3	5	1.849	.198	.957	1.419	.947	1.222
		6.03764	18 22.0 6 17	NGC 6633 062	(A7)		2	42	9.965	2	13	1.667	.585	.939	1.397	1.303	1.696
	6917	169981	18 22.1 29 46		A2IV	B	4	24	5.844	5	7	1.627	.860	.904	1.468	1.561	2.030
		170159	18 22.9 -13 -4		B0.5IB	R	2	211	8.556	2	3	.776	.284	.919	1.450	1.023	1.324
CHI	DRA 6927	170153	18 22.9 72 41		F7V	BR	9	21	3.539	11	8	1.201	.357	1.010	1.382	1.100	1.425
		171012	18 27.3 -18-26		B0.5IA		3	25	6.778	3	3	.585	.430	.871	1.487	1.160	1.513
		171094	18 27.7 -14-11		M2IAB		3	44	8.090	3	18	3.806	-1.904	1.735	.965	-1.020	-1.147
		171491	18 30.0 0 -2		(B5)		2	58	7.980	2	2	1.093	.137	.968	1.403	.879	1.160
		171589	18 30.6 -14-12		O7.5VF		3	43	8.254	3	11	.490	.662	.854	1.497	1.355	1.736
ALF	LYR 7001	172167	18 33.6 38 41		A0V	R	8	26	.059	10	10	1.505	.959	.900	1.510	1.662	2.168
		175514	18 50.6 9 13		O8VNN		4	42	8.585	3	10	.766	.289	.907	1.464	1.040	1.330
		179869	19 9.1 41 4		M3III	VR	17	33	7.092	35	9	3.166	-1.049	1.562	.997	-.250	-.116
43	SGR 7304	180540	19 11.8 -19 -8		G8II	R	2	284	5.214	2	5	2.005	-.331	1.302	1.150	.438	.633
	7308	180583	19 12.0 27 45		F6I-IIB	VR	11	49	6.160	11	17	1.760	.205	1.057	1.322	.952	1.239
		231195	19 16.1 14 14		F5IA		2	40	7.682	2	10	2.685	-.710	1.112	1.300	.097	.169
	7464	185257	19 33.1 -39-40		(A2)	VR	147	20	6.585	153	5	1.564	.657	.974	1.403	1.369	1.782
DEL	SGE 7536	187076	19 42.9 18 17		M2II+B	B	3	42	3.785	2	10	2.219	-.826	1.313	1.104	-.024	.068
		29.03772	19 46.7 29 9		O7F		3	27	10.105	4	7	.669	.400	.897	1.469	1.139	1.456
		188854	19 52.1 46 24		A7(P)		2	42	7.661	2	6	1.528	.550	.981	1.381	1.270	1.651
	7659	190056	19 58.0 -32-20		(K1)		4	62	5.018	4	6	2.382	-.572	1.424	1.084	.221	.341
		190068	19 58.1 15 5		A0P		3	26	8.250	3	9	1.414	1.003	.873	1.521	1.726	2.155
		190404	19 59.7 23 5		K1V	R	11	14	7.284	15	7	1.562	-.053	1.188	1.223	.719	.925
	7678	190603	20 .7 31 56		B1.5IA	VR	18	24	5.623	23	7	.757	.330	.914	1.462	1.083	1.383
		191287	20 4.0 -18-38		B9P		2	67	8.211	2	22	1.137	.890	.887	1.475	1.590	2.036
		191493	20 5.1 35 52		(K5)	VR	10	33	7.333	15	12	3.214	-1.087	1.655	.961	-.265	-.213
		192422	20 9.7 38 28		B0.5IB		3	25	7.099	3	4	.750	.388	.894	1.464	1.136	1.435
	7728	192472	20 9.9 -36-46		(M4)		3	40	6.357	3	8	2.844	-1.031	1.398	1.094	-.231	-.072
		192790	20 11.6 4 49		(A3)	D	3	26	8.807	3	4	1.495	.439	.990	1.388	1.172	1.528
		192913	20 12.3 27 29		A0P	R	6	21	6.642	7	7	1.193	1.042	.845	1.535	1.745	2.219
ALF 2	CAP 7754	192947	20 12.5 -12-51		G9III	RD	14	17	3.581	15	8	1.908	-.208	1.262	1.182	.559	.778
		193344	20 14.7 35 56		B9P	VR	11	18	7.604	19	9	1.344	1.012	.849	1.531	1.714	2.202
	7774	193472	20 15.3 13 14		A5M	R	16	17	5.940	21	6	1.516	.595	.973	1.401	1.312	1.711
		36.04063	20 21.9 37 3		O9.5IB		3	40	9.652	3	5	1.283	-.384	1.019	1.328	.408	.514
	7841	195506	20 26.7 45 36		K2III	VR	81	15	6.455	89	8	2.271	-.478	1.379	1.100	.312	.451
44	CYG 7847	195593	20 27.3 36 36		F5IAB	VR	26	17	6.204	40	8	2.307	-.254	1.138	1.266	.540	.684
		41.03807	20 30.6 41 16	CYG II 011	O6F		4	21	10.018	6	9	1.473	-.731	1.098	1.262	.090	.098
		196998	20 35.7 -22-40		K0V		3	38	9.680	3	13	2.048	-.458	1.357	1.090	.343	.392
55	CYG 7977	198478	20 45.5 45 45		B3IA	VR	14	22	4.828	18	8	.806	.498	.885	1.486	1.240	1.583
		200407	20 58.2 43 47		AM	R	13	16	6.736	16	8	1.492	.576	.976	1.398	1.304	1.693
	8122	202261	21 9.5 -17-46		(G5)	R	3	113	6.111	3	2	1.919	-.269	1.271	1.165	.502	.703
29	CAP 8128	202369	21 10.2 -15-35		(M3)	VR	6	27	5.289	5	4	3.195	-1.133	1.631	.980	-.323	-.219

NAME	PS	HD/BD	COORD. 1900	MEMBERSHIP	SPEC.TYPE	REM	Q	SIG	MV	P	SIG	U	V	B1	B2	V1	G
		204076	21 21.0 -32-22		B1V	VR	48	19	8.780	48	5	.361	1.141	.782	1.596	1.824	2.352
69	CYG 8209	204172	21 21.7 36 14		B0IB	R	6	18	5.909	9	7	.238	1.065	.783	1.599	1.767	2.267
		204417	21 23.3 10 11		(K0)		3	31	8.770	3	9	1.807	-.119	1.246	1.182	.647	.855
2	PEG 8225	204724	21 25.5 23 12		M1III	D	4	24	4.556	5	14	3.248	-1.061	1.678	.972	-.236	-.195
			21 28.4 47 40	NGC 7092 171	---		3	34	10.618	3	7	1.284	.514	.978	1.414	1.248	1.607
		48.03432	21 31.9 48 19	NGC 7092 185	---		3	34	10.358	3	12	1.488	.621	.952	1.421	1.349	1.744
		207131	21 41.8 54 3		(G)		2	45	8.841	2	4	1.318	.461	.971	1.383	1.186	1.541
15	PEG 8354	207978	21 48.0 28 20		F5V		4	20	5.530	3	6	1.228	.449	.981	1.404	1.179	1.539
29	AQR 8396	209278	21 57.0 -17-27		(A2)	D	3	26	6.368	2	7	1.606	.436	.988	1.383	1.172	1.512
		209308	21 57.3 53 41		B9P	R	10	22	9.111	16	9	1.125	1.003	.848	1.519	1.705	2.174
NU	PEG 8413	209747	22 .6 4 34		K4III	R	6	19	4.865	9	7	3.019	-.886	1.621	.974	-.067	-.023
		211835	22 14.9 45 18		B3VE		2	40	8.489	2	13	.458	1.016	.811	1.564	1.714	2.204
31	PEG 8520	212076	22 16.6 11 42		B2VE		2	91	4.895	3	22	.334	1.110	.785	1.595	1.799	2.316
26	CEP 8561	213087	22 24.0 64 37		B0.5IB	VR	19	27	5.497	26	7	.625	.555	.868	1.506	1.281	1.658
NU	TUC 8582	213442	22 26.2 -62-29		(M4)		4	27	4.895	3	9	3.169	-1.093	1.569	.999	-.293	-.159
		213918	22 29.7 38 49		(B7)	D	3	25	8.715	3	8	.790	1.032	.841	1.565	1.733	2.191
		214925	22 36.5 -21-18		(K0)		3	49	9.270	3	30	2.749	-.886	1.413	1.087	-.077	-.014
19	PSA 8637	214966	22 36.8 -29-53		(M5)		4	31	6.151	4	9	3.105	-1.040	1.557	1.007	-.245	-.098
		215038	22 37.3 75 8		A0P		4	20	8.194	4	4	.858	1.004	.834	1.535	1.712	2.160
XI	OCT 8663	215573	22 41.0 -80-39		(B5)		3	32	5.321	2	4	.826	1.128	.803	1.566	1.810	2.341
		216411	22 47.6 58 28		B1IA	VR	28	30	7.203	50	9	.788	.259	.918	1.443	1.004	1.294
DEL	AQR 8709	216627	22 49.3 -16-21		A2V	R	6	22	3.263	7	8	1.629	.878	.905	1.487	1.582	2.067
		217227	22 54.2 43 18		B2V		4	23	7.167	3	12	.656	1.025	.819	1.558	1.721	2.219
		218393	23 2.6 49 40		BPE	R	2	45	7.010	3	11	.802	.579	.878	1.479	1.313	1.666
4	AND 8804	218452	23 3.1 45 51		K5III	VR	63	21	5.318	75	7	2.939	-.833	1.601	.989	-.017	.039
	8818	218655	23 4.6 -41 -8		(M3)		5	58	5.889	5	16	3.113	-1.069	1.543	1.018	-.272	-.123
		219430	23 10.6 -9-37		K3V	VR	7	29	9.172	6	8	2.055	-.335	1.376	1.097	.452	.552
	8883	220096	23 15.9 -27-32		K0III		4	22	5.660	4	4	1.626	-.063	1.171	1.236	.692	.943
	8889	220263	23 17.2 -60-36		(M1)		3	40	6.091	3	9	3.097	-1.116	1.609	.981	-.307	-.208
15	AND 8947	221756	23 29.7 39 41		A1III		4	24	5.586	5	7	1.585	.851	.915	1.467	1.556	2.040
		-13.06464	23 43.3 -13-32		(K8E)	D	3	25	9.593	2	7	2.297	-.608	1.471	1.037	.209	.229
	9049	224113	23 50.1 -32-29		B6V	VR	128	47	6.085	130	6	.891	1.080	.825	1.554	1.767	2.285
		225047	23 57.8 -30-43	SA 140 159	A0V	VR	48	20	8.396	48	8	1.435	.933	.891	1.484	1.624	2.120

REMARKS TO TABLE III

HD 000166	Microvariable in V magnitude.
HD 002491	Two unaccountably different V magnitudes were measured (V mag. diff. = .30) .
HD 002905	Microvariable in V magnitude.
BD+63.00137	Microvariable in V magnitude and in colours.
HD 010436	Microvariable in V magnitude and in colours.
NGC 0752 500	Very blue object pointed out by Mrs. Rebeirot of Marseilles Observatory close to the NGC 752 cluster; microvariable in V magnitude.
HD 012399	Microvariable in V magnitude and in colours.
HD 012953	Microvariable in V magnitude.
HD 013267	Microvariable in V magnitude.
HD 013970	Microvariable in V magnitude and colours; likely a Ell-type variable.
HD 014489	Microvariable in V magnitude.
HD 014633	Microvariable in V magnitude.
HD 014956	Microvariable in V magnitude.
HD 015152	Microvariable in V magnitude.
HD 015497	Microvariable in V magnitude.
HD 017378	Microvariable in V magnitude.
HD 017971	Microvariable in V magnitude.
HD 018391	Microvariable in colours.
HD 022468	Three unaccountably different V magnitudes were measured,probably a variable star.
HD 022649	Microvariable in V magnitude.
HD 026574	Possibly microvariable in V magnitude.
NGC 1545 005	Microvariable in V magnitude.
NGC 1545 004	Microvariable in V magnitude and colours.
NGC 1545 003	Microvariable in V magnitude and colours.
HD 027536	Microvariable in V magnitude.
HD 033328	Microvariable in V magnitude.
HD 034921	Microvariable in colours and in V magnitude.
HD 035165	Microvariable in V magnitude.
HD 036619	Likely microvariable in V magnitude.
HD 037001	Possibly microvariable in V magnitude.
HD 041117	Microvariable in V magnitude.
HD 042087	Microvariable in V magnitude.
NGC 2244 006	Possibly microvariable in V magnitude.
NGC 2244 003	Presumption of microvariability.
HD 046273	Two unaccountably different V magnitudes were measured (V mag.diff.=.55) .
HD 046282	Two unaccountably different V magnitudes were measured (V mag.diff.=.40) .
NGC 2264 088	Microvariable in V magnitude.
HD 048329	Microvariable in V magnitude.
HD 049131	Large unexplained differences of magnitude and colours between J.D. 2443614.5 and J.D. 2443943 TO 2443946 .
HD 049336	Certainly variable in V magnitude and microvariable in colours.
NGC 2301 002	Microvariable in V magnitude.
NGC 2422 062	Possibly microvariable in V magnitude.
NGC 2422 070	Possibly microvariable in V magnitude.
NGC 2516 101	Possibly microvariable in V magnitude and in colours, effects of background not excluded.
NGC 2516 040	Possibly microvariable in V magnitude.
NGC 2516 127	Possibly microvariable in V magnitude and in colours, effects of background not excluded.
NGC 2516 038	Possibly microvariable in V magnitude.
NGC 2516 134	Possibly microvariable in V magnitude.
HD 068290	Possibly microvariable in V magnitude.
HD 077320	Microvariable in V magnitude; likely a Beta Cep-type variable.
HD 077581	Microvariable in V magnitude.
HD 079210	Component A of a couple, the B component of which is star HD 79211.
HD 083754	Microvariable in V magnitude and possibly microvariable in colours.
HD 088230	Microvariable in V magnitude.
HD 089025	Microvariable in V magnitude.
HD 089353	Variable in V magnitude.
HD 090089	Microvariable in V magnitude.
HD 090132	Two V magnitudes are close to 5.332 whereas the third is 5.582 for J.D. 2443614.681.
HD 091316	Possibly microvariable in V magnitude.
HD 096314	Two V magnitudes are close to 5.652 whereas the third is 5.901 for J.D. 2443561.805.
NGC 3532 226	Microvariable in V magnitude and possibly microvariable in colours.
HD 097859	Possibly microvariable in V magnitude.
HD 098262	Microvariable in colours and V magnitude.
HD 100943	Three unaccountably different V magnitudes were measured,probably a variable star.
HD 105435	Microvariable in V magnitude.
HD 106591	Possibly microvariable in V magnitude.
COMA TR 101	Microvariable in V magnitude.
HD 108250	Microvariable in V magnitude.
COMA TR 150	Microvariable in V magnitude, possibly microvariable in colours.
HD 109896	Possibly microvariable in V magnitude.
HD 110318	Two unaccountably different V magnitudes were measured for the pair HD 110317 - 110318 .
HD 112374	Variable in V magnitude and in colours.
HD 114529	Certainly a variable star, probably of EW-type.
HD 121849	Possibly microvariable in V magnitude.
HD 122132	Microvariable in colours and in V magnitude.
HD 128165	Possibly microvariable in V magnitude.
HD 128220	Microvariable in colours and in V magnitude.
HD 129929	Microvariable in V magnitude.
HD 140573	Possibly microvariable in V magnitude.
HD 141003	Possibly microvariable in V magnitude.
NGC 6025 012	Microvariable in V magnitude.
NGC 6025 003	Microvariable in V magnitude.

HD 149019 Microvariable in V magnitude.
NPL 043+37.1 The measure is made through a 1 arc min. circular aperture.
HD 151288 Microvariable in V magnitude.
HD 152236 Microvariable in V magnitude.
HD 152728 Faint star with dispersed measurements,likely a variable star.
HD 155203 Microvariable in V magnitude.
HD 158741 Possibly microvariable in V magnitude.
HD 161796 Microvariable in colours and V magnitude.
HD 161817 Microvariable in V magnitude.
NGC 6475 088 Possibly microvariable in V magnitude.
HD 168454 Possibly microvariable in V magnitude.
HD 170159 Two unaccountably different V magnitudes were measured (V mag.diff.=.43) .
HD 170153 Possibly microvariable in V magnitude.
HD 172167 Dispersion in V magnitude results from particular observational circumstances.
HD 179869 Microvariable in V magnitude.
HD 180540 Two unaccountably different V magnitudes were measured (V mag.diff.=.58) .
HD 180583 Certainly variable in V magnitude and colours.
HD 185257 Microvariable in V magnitude.
HD 190404 Possibly microvariable in V magnitude.
HD 190603 Microvariable in V magnitude.
HD 191493 Microvariable in V magnitude and possibly microvariable in colours.
HD 192913 Possibly microvariable in V magnitude.
HD 192947 Possibly microvariable in V magnitude.
HD 193344 Microvariable in V magnitude.
HD 193472 Possibly microvariable in V magnitude.
HD 195506 Microvariable in V magnitude.
HD 195593 Microvariable in V magnitude.
HD 198478 Microvariable in V magnitude.
HD 200407 Possibly microvariable in V magnitude.
HD 202261 Two V magnitudes are close to 6.045 whereas the third is 6.305 for J.D. 2443353.684 .
HD 202369 Microvariable in V magnitude.
HD 204076 Microvariable in V magnitude.
HD 204172 Possibly microvariable in V magnitude.
HD 209308 Possibly microvariable in V magnitude.
HD 209747 Possibly microvariable in V magnitude.
HD 213087 Microvariable in V magnitude.
HD 216411 Microvariable in V magnitude.
HD 216627 Possibly microvariable in V magnitude.
HD 218393 One of the 3 measurements shows a deviating value of the colour U (0.74 instead of 0.83). The V magnitude is then 6.95 instead of 7.04.
HD 218452 Microvariable in V magnitude.
HD 219430 The star is double, probably variable or perhaps disturbed by HD 219449.
HD 224113 EA-type variable (see Astron. Astrophys. suppl. 39,121).

SA 140 159 Microvariable in V magnitude.

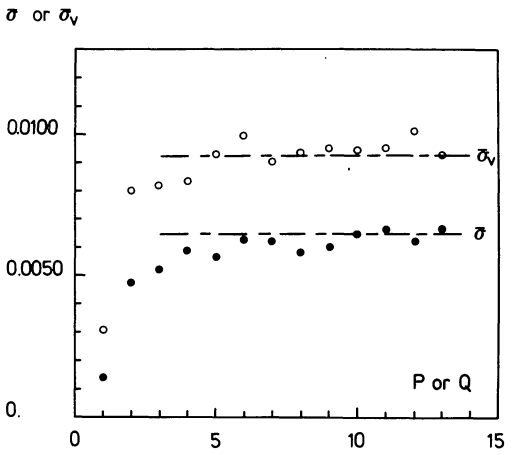

FIGURE 1. — Variation of the mean value of the standard deviations of the colours (σ) and the V magnitude ($\bar{\sigma}_v$) observed as a function of the number of good P or Q measurements. These means of standard deviations have been calculated using Rufener's catalogue (1981) after eliminating the variable stars. The reference lines (thin lines) correspond to the typical values obtained on a sample of 168 most frequently measured non variable stars.

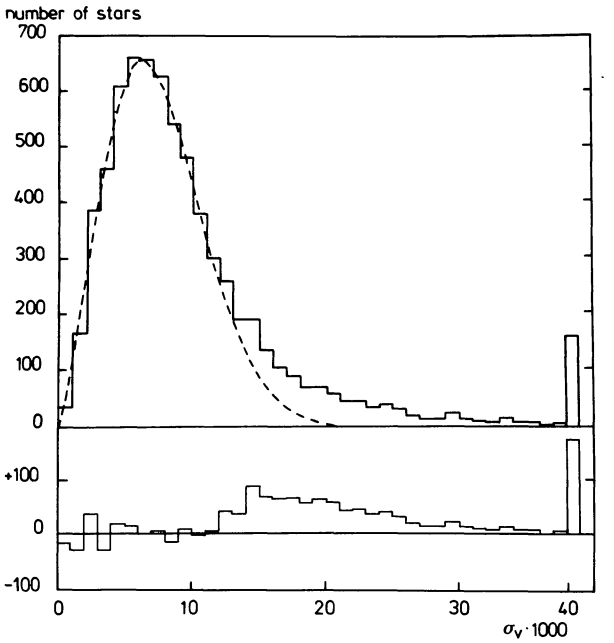

FIGURE 2. — The upper part of the figure shows the histogram of the standard deviations observed on the V magnitude (σ_v) for all the stars contained in Rufener's third catalogue (1981) having a number of good measurements $Q \geqslant 3$. The superimposed distribution, drawn in broken line, represents a function χ^2 calculated for 2.3 degrees of freedom and a standard deviation of the population with the value $s'_v = 8.2 \times 10^{-3}$. The difference between these two distributions is illustrated at the bottom of the figure; see text for its interpretation.