

UN-NAMED FLEMING VARIABLES

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Abstract

Among nearly 300 variable stars discovered by Williamina P. Fleming or under her direction, there are only fourteen that have not been sufficiently observed to have been assigned permanent designations in the *General Catalogue of Variable Stars*. From the available data, they appear to merit further investigation.

Introduction and discussion

Williamina P. Fleming (1857–1911) reported the discovery of over 300 variables (Fleming and Pickering 1907; Fleming 1912; Müller and Hartwig 1922), the majority having been discovered by her by means of their spectral peculiarities. Of these, there now remain only fourteen that have not yet received final designation in the *General Catalogue of Variable Stars* (GCVS) (Kholopov *et al.* 1985–87), but all are included in the *New Catalogue of Suspected Variable Stars* (NSV) (Kholopov *et al.* 1982). These fourteen stars are listed by their NSV numbers in Table 1.

The published amplitudes and/or spectral classes suggest that they are favorable candidates for more extensive investigations. Kholopov cites references to finder charts for those with an asterisk [*]. Under the heading *Early* are given provisional types of variation, either from the NSV catalogue or from Fleming's papers, as well as Fleming's own spectral classes. The next column gives available modern determinations of spectral class. The column headed *Seq* indicates the availability of magnitude sequences. The numbers refer to the number of each star in *Harvard Annals* Volume 46 (Fleming and Pickering 1907); the symbol # indicates stars in *Harvard Annals* Volume 56 (Fleming 1912) for which neither sequences nor finder charts are given. Finder charts are cited in the NSV for only three of the stars in Table 1, namely NSV 6200 (Bateson 1968), NSV 7645 (Bateson *et al.* 1977), and NSV 11792 (Walker and Olmsted 1958). The final column gives corresponding DM or HD numbers to help identify the variables. Only for NSV 11913 is neither a BD nor an HD number available; however, the star is only 5.4 arcminutes North following the Mira-type variable W Sge.

References

- Bateson, F. M. 1968, *New Zealand Circ.*, No. 129.
 Bateson, F. M., Morel, M., and Winnett, R. 1977, *Charts for Southern Variables*, Ser. 9.
 Fleming, W. P. 1912, *Ann. Harvard Coll. Obs.*, **56**, No. 6., 165.
 Fleming, W. P., and Pickering, E. C. 1907, *Ann. Harvard Coll. Obs.*, **47**, Part I.
 Kholopov, P. N. *et al.* 1982, *New Catalogue of Suspected Variable Stars*, Moscow.
 Kholopov, P. N. *et al.* 1985–87, *General Catalogue of Variable Stars*, 4th ed., Moscow.
 Müller, G., and Hartwig, E. 1922, *Geschichte u. Literatur des Lichtwechsels*, **3**.
 Walker, A. D., and Olmsted, M. 1958, *Publ. Astron. Soc. Pacific*, **70**, 495, star no. 38.

Table 1. Fleming variables needing confirmation.

NSV	R.A. (1950)	Dec	Max ptg	Min ptg	Early		New		Seq No.*	DM
					Var	Sp	Var	Sp		
756	02 ^h 11 ^m 04 ^s	-71°43'.1	9.6	10.5	I	Mc5d	M5/7III	8	-72°155	
840	02 27 02	-69 44.5	7.8	8.8		Mc5d	M6/7	10	-70°155	
1214	03 36 40	-55 33.5	8.0	8.9		Md:	M6/7III:	17	-55°551	
3379	07 03 27	-35 51.7	8.0	8.6		Md7	M6III	34	-35°3334	
5173	11 19 05	-55 29.3	9.7	10.4		Na	C	#	HD 98767	
6135 a	13 09 20	-56 44.1	9.8	10.4	I	Np	S5	73	-56°5632	
6200	13 18 22	-61 18.6	10.5	11.3	Lb	Md	S:	76	-60°4511	
6507 b	13 54 55	-56 06.6	9.8	10.8	Lb:	N	C	#	-55°5802	
7645	16 18 20	-50 21.3	9.6	10.8	Lb	Md:	K1/2III:	101	-50°6442	
8476 a	17 15 17	-45 54.8	11.5	12.5	Lb	N	C	#	-45°11383	
11738	19 03 56	-48 39.2	11.2	—		Mc	M4/7	140	-48°12910	
11792	19 08 53	-01 28	10.8	13.2		Na	R8	#	HD 179173	
11913	19 17 38	+17 08.5	12.2	14.5	I:	Md:	Mc	150	—	
12993 a	20 16 38	-49 58.8	13.	13.7		N	C	173	-50°12918	

* Sequences in *Ann. Harvard Coll. Obs.*, 47, Part I.

No sequences available.

a Variability discovered by L. Wells.

b Variability discovered by H. Leavitt.