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VARIABLE STARS IN FIELD A OF NGC 6822

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In the context of our programme to study Cepheids in nearby galaxies (Antonello et al. 1999), we observed 5 fields in the irregular galaxy NGC 6822 (a Local Group member with $m - M = 24^m5$) during 3 runs from 1996 to 1998. The observations were performed with the direct CCD camera attached to the Dutch 0.9m telescope of the La Silla Observatory. Each field has a size of $3'8 \times 3'8$. Most of the observations were performed without filter (*Wh* band) in order to get the best photon statistics for detecting the variability of very faint objects (Antonello et al. 1999; Antonello et al. 2000; Riess et al. 1999). Two images in *V* and *R* filters were taken to get information about star colors.

A sufficient number of frames to allow a reliable study of time series have been obtained for Field A, for which we have 34 *Wh* images. This field is approximately at the centre of the galaxy (its coordinates are $\alpha_{2000} = 19^h44^m58^s$, $\delta_{2000} = -14^\circ48'18''$). The data reduction and calibrations of these frames, the methods adopted to detect variable objects, together with the results concerning the Cepheid-like variables were presented and discussed by Antonello et al. (2002). An approximate transformation of our *Wh* magnitudes to *V* ones is given by $V = Wh - 0.04(V - R) + 0.38(V - R)^2$.

In this note we report the newly discovered variable stars belonging to other classes. In the field we got reliable measurements for 4552 stars and among them we detected 130 variable objects. From the scatter of the data of non-variable objects we estimate that the external standard deviation is about 0.1 mag at $Wh=21^m0$ and 0.2 mag at $Wh=22^m0$. The group of variable stars includes 21 Cepheids and 4 W Vir stars, discussed by Antonello et al. (2002), and another 13 periodic variables, none of which was previously known, listed with their main characteristics in Table 1.

The remaining 91 objects are long period or irregular variables; three of them were previously detected by Kayser (1967). They are listed in Table 2. Given the distribution of our observations, no reliable period or time-scale of variation can be determined. The observed amplitudes range from about 0.15 to 2.0 mag; in particular, for V1534, V1838, V2881, V3389 (Kayser variable V10) and V3587, variations larger than 1 mag were observed. For the other two Kayser variables (V19 and V23, corresponding to ours V0384 and V1023), variations of 0.24 and 0.43 mag were observed, respectively. Most of these stars are red. However there are also a few blue (e.g. V1795 and V3416), and intermediate colour objects.

Table 1. Periodic variables in Field A of NGC 6822

Name	$\alpha(2000)$ [h m s]	$\delta(2000)$ [° ' "]	P [d]	Wh	$V - R$ [mag]	Ampl.
V0363	19 45 05.31	-14 49 25.2	22.88	21.74	2.10	0.3
V0646	19 44 54.24	-14 48 50.2	1.254	22.91	—	0.6
V1038	19 44 51.74	-14 48 03.2	0.9291	21.48	1.23	0.2
V1486	19 44 56.80	-14 47 14.6	57.46	20.73	2.06	0.3
V1550	19 44 51.49	-14 47 08.2	35.11	20.46	2.91	0.4
V1829	19 45 02.85	-14 46 30.7	2.11	21.44	1.50	0.3
V2302	19 44 53.71	-14 47 35.4	0.8430	21.25	1.80	0.2
V2508	19 44 51.33	-14 49 57.4	1.0338	21.20	1.19	0.2
V2694	19 44 51.11	-14 48 37.0	20.84	21.37	1.54	0.15
V2872	19 44 56.20	-14 47 30.8	1.550	22.41	1.14	0.8
V3034	19 44 58.00	-14 46 24.6	30.1	22.34	0.45	0.4
V3748	19 44 56.21	-14 46 53.9	33.53	20.54	2.04	0.2
V4443	19 44 54.74	-14 50 05.2	0.6479	23.16	—	1.2

The identification map for the variable stars is reported in the paper of Antonello et al. (2002).

References:

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Table 2. Long period and irregular variables in Field A of NGC 6822

Name	$\alpha(2000)$ [^h ^m ^s]	$\delta(2000)$ [[°] ["] [']]	<i>Wh</i>	<i>V - R</i>	Ampl [mag]	Kayser Ident.
V0002	19 44 51.90	-14 50 11.3	20.74	1.77	0.23	
V0005	19 44 57.15	-14 50 09.5	20.42	1.21	0.19	
V0008	19 44 54.06	-14 50 10.3	20.01	1.94	0.16	
V0081	19 44 51.72	-14 50 03.9	20.73	1.31	0.38	
V0100	19 45 03.27	-14 49 59.8	21.28	1.70	0.42	
V0103	19 44 58.87	-14 50 00.5	20.99	2.24	0.17	
V0126	19 45 05.36	-14 49 54.6	21.34	1.63	0.39	
V0130	19 44 58.73	-14 49 55.7	20.86	1.73	0.26	
V0131	19 44 58.75	-14 49 54.4	21.26	2.01	0.91	
V0160	19 45 03.63	-14 49 50.4	20.92	1.50	0.30	
V0161	19 45 03.48	-14 49 49.4	20.70	1.62	0.18	
V0181	19 44 56.74	-14 49 49.2	20.03	0.68	0.37	
V0212	19 44 51.42	-14 49 47.0	21.08	3.24	0.29	
V0218	19 45 00.38	-14 49 43.9	19.97	0.81	0.15	
V0226	19 44 57.45	-14 49 43.7	21.00	2.58	0.57	
V0321	19 45 01.26	-14 49 31.8	20.16	1.87	0.19	
V0331	19 45 03.80	-14 49 27.0	21.24	2.29	0.55	
V0384	19 44 57.32	-14 49 20.0	16.80	1.56	0.24	V19
V0395	19 44 56.94	-14 49 22.0	20.82	1.74	0.55	
V0407	19 44 58.93	-14 49 20.0	21.71	1.99	0.67	
V0606	19 44 54.90	-14 48 55.5	21.78	—	0.79	
V0662	19 44 58.58	-14 48 46.8	21.64	—	0.49	
V0694	19 45 04.71	-14 48 42.3	21.14	2.31	0.42	
V0777	19 44 54.56	-14 48 28.6	21.10	1.45	0.29	
V0837	19 45 02.53	-14 48 23.9	20.95	2.02	0.31	
V0931	19 45 05.81	-14 48 15.0	21.25	3.04	0.58	
V1023	19 44 54.47	-14 48 06.4	17.67	1.53	0.43	V23
V1041	19 44 50.99	-14 48 05.1	22.87	1.35	0.76	
V1051	19 45 02.82	-14 48 01.2	21.93	—	0.65	
V1052	19 45 05.78	-14 48 00.2	20.96	1.37	0.15	
V1099	19 45 04.13	-14 47 54.3	20.76	1.74	0.19	
V1118	19 44 53.80	-14 47 52.2	19.92	1.81	0.20	
V1160	19 44 55.28	-14 47 44.1	20.77	1.15	0.25	
V1175	19 44 53.55	-14 47 47.2	21.78	1.29	0.80	
V1201	19 44 51.83	-14 47 46.1	21.06	2.87	0.31	
V1429	19 45 01.99	-14 47 17.8	21.37	—	0.67	
V1430	19 45 01.93	-14 47 15.7	21.51	3.13	0.40	
V1438	19 44 50.86	-14 47 07.0	22.04	1.71	0.49	
V1470	19 45 03.92	-14 47 10.8	21.51	1.55	0.90	
V1514	19 45 06.33	-14 47 05.7	21.10	1.60	0.43	
V1521	19 45 02.96	-14 47 09.4	21.28	1.38	0.40	
V1534	19 45 00.52	-14 47 05.0	21.25	3.00	1.17	
V1562	19 44 54.29	-14 47 01.7	20.62	2.24	0.29	
V1578	19 44 53.79	-14 47 00.4	21.02	1.48	0.41	
V1598	19 44 57.48	-14 47 00.2	21.58	2.07	0.18	

Table 2. (continued)

Name	$\alpha(2000)$ [^h ^m ^s]	$\delta(2000)$ [[°] ['] ^{''}]	Wh	$V - R$	Ampl. [mag]	Kayser Ident.
V1648	19 44 53.38	-14 46 56.5	21.00	2.18	0.22	
V1692	19 44 58.04	-14 46 47.2	21.20	0.90	0.55	
V1719	19 44 51.97	-14 46 47.0	20.90	2.17	0.27	
V1726	19 44 51.63	-14 46 48.1	20.43	1.52	0.28	
V1795	19 44 53.78	-14 46 35.2	20.54	-0.45	0.23	
V1819	19 44 54.24	-14 46 35.1	20.86	1.38	0.38	
V1838	19 44 53.65	-14 46 29.0	20.28	1.81	1.15	
V1878	19 45 05.70	-14 46 25.8	21.48	—	0.92	
V1898	19 45 03.42	-14 46 18.3	21.17	1.98	0.51	
V2003	19 44 56.39	-14 50 11.4	20.85	1.42	0.44	
V2005	19 45 01.97	-14 50 06.5	20.67	2.18	0.22	
V2007	19 44 51.62	-14 50 07.2	21.56	1.37	0.34	
V2009	19 44 57.42	-14 50 02.3	20.66	2.15	0.32	
V2021	19 45 01.20	-14 49 52.4	21.01	0.74	0.79	
V2099	19 44 57.63	-14 49 06.1	20.92	1.69	0.21	
V2107	19 45 02.47	-14 49 04.3	20.14	2.09	0.27	
V2132	19 44 51.64	-14 48 57.9	18.84	1.44	0.11	
V2144	19 44 58.32	-14 48 52.3	19.78	1.77	0.28	
V2167	19 44 51.95	-14 48 36.6	19.96	1.46	0.18	
V2194	19 45 04.94	-14 48 20.8	20.90	2.03	0.39	
V2197	19 44 56.12	-14 48 22.6	20.86	1.66	0.50	
V2198	19 44 53.53	-14 48 20.7	21.64	1.71	0.33	
V2214	19 44 51.66	-14 48 15.5	21.91	1.98	0.33	
V2229	19 44 58.55	-14 48 02.5	21.47	—	0.45	
V2248	19 44 52.39	-14 48 03.7	19.67	2.07	0.48	
V2351	19 44 56.40	-14 47 04.6	20.71	0.44	0.56	
V2379	19 44 55.86	-14 46 57.3	20.31	0.48	0.48	
V2540	19 44 55.76	-14 49 43.1	19.93	2.12	0.15	
V2639	19 45 01.03	-14 49 02.7	21.53	2.11	0.34	
V2677	19 44 51.77	-14 48 49.0	21.31	1.50	0.39	
V2718	19 44 57.60	-14 48 28.0	17.96	1.66	0.16	
V2881	19 44 58.84	-14 47 26.6	21.41	1.72	1.60	
V2883	19 45 05.07	-14 47 25.0	20.44	1.70	0.52	
V3198	19 45 03.79	-14 47 31.6	21.08	2.45	0.32	
V3389	19 44 54.20	-14 48 45.1	21.08	1.67	2.05	V10
V3391	19 44 54.97	-14 48 44.4	21.78	—	0.23	
V3416	19 44 57.87	-14 48 30.7	21.94	0.01	0.83	
V3440	19 44 54.93	-14 48 15.4	20.58	2.23	0.33	
V3491	19 44 53.81	-14 47 43.0	21.25	1.54	0.39	
V3587	19 44 59.43	-14 46 30.8	22.23	0.65	1.01	
V3610	19 44 56.75	-14 46 25.1	21.29	—	0.62	
V3642	19 44 55.50	-14 49 22.8	19.99	0.74	0.12	
V3699	19 45 01.11	-14 48 18.3	21.16	1.02	0.53	
V3775	19 44 54.50	-14 49 35.2	21.54	1.08	0.52	
V3808	19 44 59.17	-14 47 15.4	21.43	—	0.52	
V4175	19 44 57.70	-14 47 44.2	22.23	—	0.60	