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Mira Variables from the OGLE II Galactic Disc Photometric Database in Centaurus and Norma

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		Cen_SC1 24720	13 56 45.55, -62 36 02.2	M	14.4	>17.2	I	600::	2451319	Max			Cen_SC1_24720.gif		Cen_SC1_24720.dat
2		Cen_SC1 39931	13 57 09.84, -62 56 53.6	M	14.0	16.7:	I	520:		other			Cen_SC1_39931.gif		Cen_SC1_39931.dat
3		Cen_SC1 79775	13 58 09.60, -63 13 14.7	M	<16.2	>18.7	I	400:	2451626	Max			Cen_SC1_79775.gif		Cen_SC1_79775.dat
4		Cen_SC1 75886	13 58 11.10, -63 25 12.9	M	13.0	>15.4	I	400:	2451672	Max			Cen_SC1_75886.gif		Cen_SC1_75886.dat
5		Cen_SC2 1798	13 58 35.53, -63 24 55.5	M	13.3	14.1	I	395	2451314	Max			Cen_SC2_1798.gif		Cen_SC2_1798.dat
6		Cen_SC2 28594	13 59 15.88, -63 09 44.1	M	<14.8	>17.6	I	380		other			Cen_SC2_28594.gif		Cen_SC2_28594.dat
7		Cen_SC2 34394	13 59 25.70, -62 54 22.8	M	13.0	15.5	I	200	2451618	Max			Cen_SC2_34394.gif		Cen_SC2_34394.dat
8		Cen_SC2 83633	14 00 09.71, -62 37 12.8	M	<16.5	>17.9	I	395	2450919	Min			Cen_SC2_83633.gif		Cen_SC2_83633.dat
9		Nor_SC1 8057	16 12 22.06, -54 28 02.7	M	<10.9	13.3	I	430	2450925	Min			Nor_SC1_8057.gif		Nor_SC1_8057.dat
10		Nor_SC1 72494	16 12 33.48, -54 23 16.7	M	11.1	14.3	I	346	2451686	Max			Nor_SC1_72494.gif		Nor_SC1_72494.dat
11		Nor_SC1 214406	16 13 38.92, -54 08 19.0	M	11.7	>14.3	I	350	2451230	Max			Nor_SC1_214406.gif		Nor_SC1_214406.dat
12		Nor_SC2 32631	16 13 52.33, -54 01 55.0	M	<12.5	14.0	I	392	2451328	Min			Nor_SC2_32631.gif		Nor_SC2_32631.dat
13		Nor_SC2 97927	16 14 00.84, -54 06 03.0	M	12.0	14.7	I	323	2451730	Max			Nor_SC2_97927.gif		Nor_SC2_97927.dat
14		Nor_SC2 116222	16 14 03.59, -53 54 04.8	M	15.7	18.3:	I	474	2451340	Max			Nor_SC2_116222.gif		Nor_SC2_116222.dat
15		Nor_SC2 201418	16 14 31.10, -53 36 59.8	M	11.6	13.7:	I	319	2451635	Max			Nor_SC2_201418.gif		Nor_SC2_201418.dat
16		Nor_SC3 132451	16 15 42.90, -53 34 49.5	M	12.1	14.9	I	303	2451291	Max			Nor_SC3_132451.gif		Nor_SC3_132451.dat
17		Nor_SC3 132435	16 15 48.65, -53 33 05.8	M	11.5	14.5	I	600:	2450921	Max			Nor_SC3_132435.gif		Nor_SC3_132435.dat
18		Nor_SC3 174524	16 16 06.35, -53 54 43.5	M	<12.3	13.9	I	382	2451312	Min			Nor_SC3_174524.gif		Nor_SC3_174524.dat
19		Nor_SC3 217292	16 16 41.81, -54 15 30.6	M	12.1	14.9	I	560:	2450974	Max			Nor_SC3_217292.gif		Nor_SC3_217292.dat
20		Nor_SC4 68051	16 16 49.02, -53 26 13.8	M	11.1:	12.8	I	385	2451259	Min			Nor_SC4_68051.gif		Nor_SC4_68051.dat
21		Nor_SC4 29981	16 16 50.93, -53 56 53.2	M	12.2	15.1:	I	425	2451328	Max			Nor_SC4_29981.gif		Nor_SC4_29981.dat
22		Nor_SC4 125329	16 17 13.41, -53 33 55.6	M	11.8	14.6	I			other			Nor_SC4_125329.gif		Nor_SC4_125329.dat

23		Nor_SC4 181886	16 17 28.99, -53 41 33.0	M	12.7	15.9	I			other			Nor_SC4_181886.gif		Nor_SC4_181886.dat
24		Nor_SC4 208572	16 17 48.10, -54 12 25.6	M	11.5	13.7	I	251	2450947	Max		Comm. 24	Nor_SC4_208572.gif		Nor_SC4_208572.dat
25		Nor_SC6 103911	16 24 18.04, -52 20 13.0	M	<12.0	>13.2	I	365		other			Nor_SC6_103911.gif		Nor_SC6_103911.dat
26		Nor_SC6 226151	16 25 01.15, -52 27 27.6	M	<13.0	14.9	I	377	2451238	Min			Nor_SC6_226151.gif		Nor_SC6_226151.dat
27		Nor_SC7 59850	16 25 41.54, -51 53 06.5	M	12.5	15.3	I	402	2450958	Max		Comm. 27	Nor_SC7_59850.gif		Nor_SC7_59850.dat
28		Nor_SC7 100009	16 25 55.08, -52 15 19.2	M	<11.9	14.5	I	410		other			Nor_SC7_100009.gif		Nor_SC7_100009.dat
29		Nor_SC7 128069	16 26 08.63, -51 51 42.0	M	12.5:	15.9	I	500:		other		Comm. 29	Nor_SC7_128069.gif		Nor_SC7_128069.dat
30		Nor_SC8 46758	16 27 10.07, -52 02 39.3	M	12.8	>15.0	I	385	2451270	Max		Comm. 30	Nor_SC8_46758.gif		Nor_SC8_46758.dat
31		Nor_SC8 156431	16 27 54.67, -52 06 35.8	M	12.2	13.9	I	255	2450950	Max		Comm. 31	Nor_SC8_156431.gif		Nor_SC8_156431.dat
32		Nor_SC8 208200	16 28 14.44, -52 04 14.3	M	<11.8	13.5	I	335	2451681	Min			Nor_SC8_208200.gif		Nor_SC8_208200.dat

Comments:

24. First noted as a variable star in Derut et al. (2002).

27. First noted as a variable star in Derut et al. (2002).

29. First noted as a variable star in Derut et al. (2002).

30. First noted as a variable star in Derut et al. (2002).

31. First noted as a variable star in Derut et al. (2002).

Remarks:

The OGLE On-line Photometric Databases (Szymanski 2005) carry epoch photometry from the OGLE II surveys (Udalski et al. 1997) released to the public domain, and including a survey pointed at some fields in the Galactic Disc for which apparently no variability study has been published despite being available for several years.

Of lesser duration than the Bulge and Magellanic Cloud surveys, this dataset nevertheless can be seen to contain nearly one million stars fulfilling the criterion of having about one hundred plus observations each and is spread over an approximately one thousand day interval. This is sufficient for the assessment of period and variability type for many types of variable star, especially periodic ones, and even long period variables such as Mira stars.

An examination of the database returned 78 certain Mira variables, 32 from the Centaurus and Norma fields are presented here. A further 46 can be found in the Scorpius fields. The Carina fields appeared to have no readily apparent certain Mira variables that could be readily distinguished from semiregular variables. This compares well with a survey for Miras (Groenewegen and Blommaert 2005) conducted upon the admittedly slightly denser OGLE II Bulge fields of roughly thirty million stars, which reported nearly three thousand Mira variables. That is, the fraction of Miras is an order of four less in these two cases.

This list of 32 Mira variables gives details of the stars. As the OGLE II experiments use a passband that is very near to Cousins I, the amplitude of variability for these Miras is somewhat suppressed relative to situation with Johnson V, which is normally the case (see for example Lockwood and Wing (1971) for I band lightcurves of well known classical Miras), but the morphology of the lightcurves make the class evident enough. Another similarity to the Lockwood and Wing paper is the fact that despite a passband being used that is away from the opaque Titanium Oxide absorption lines, the lightcurves do not necessarily repeat cleanly from one cycle to the next, whether in peak magnitude or in ascending branch hump location or in cycle to cycle interval.

The seasonal nature of the survey, the short duration relative to the periods involved, and the magnitude limits, all combine to not allow coverage of more than three to four cycles at most for these objects, with maxima and minima being missing in some instances. Nevertheless period analysis of the data allows some good and very good periods to be determined, as well as approximate ones, and if minima are used in addition to the traditional maxima, epoch information can also be gleaned.

None of the stars are noted in the GCVS, NSV (http://www.sai.msu.su/groups/cluster/gcvs/gcvs/iii/html/) nor ASAS variable star listings (http://www.astrouw.edu.pl/asas/?page=download), the resources most likely to cover these regions, which is to be somewhat expected as Mira variables will on the whole have V-Ic colours of 2, 3 or higher, thus often being much fainter in the more traditionally used Johnson V and visual ranges used in traditional variability surveys. Five stars (Nor_SC4 208572, Nor_SC7 59850, Nor_SC7 128069, Nor_SC8 46758, and Nor_SC8 156431) were found variable in the EROS II project (Derut et al. 2002) but not studied in any detail.

References:

Derue, F., Marquette, J.-B., Lupone, S., et al., 2002, Astron. Astrophys., 389, 149
Groenewegen, M.A.T., Blommaert, J.A.D.L., 2005, Astron. Astrophys., 443, 143
Lockwood, G.W., Wing, R.F., 1971, Astrophys. J., 169, 63
Szymanski, M., 2005, Acta Astronomica, 55, 43
Udalski, A., Kubiak, M., Szymanski, M., 1997, Acta Astronomica, 47, 319