

## Eclipsing Variables from the MACHO Galactic Bulge Scutum Fields II

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		MACHO 303.44074.130	18 29 29.74, -15 03 30.7	EA	16.15	17.00	R	4.641240	2451390.918	min		<a href="#">Comm. 1</a>	<a href="#">303_44074_130.jpg</a>		<a href="#">303_44074_130.txt</a>
2		MACHO 303.44411.331	18 29 49.84, -15 02 54.8	EA	16.65	17.50	R	1.646198	2449908.177	min		<a href="#">Comm. 2</a>	<a href="#">303_44411_331.jpg</a>		<a href="#">303_44411_331.txt</a>
3		MACHO 302.44755.97	18 30 32.94, -14 30 06.3	EA	15.50	16.40	R	1.027200	2449924.941	min		<a href="#">Comm. 3</a>	<a href="#">302_44755_97.jpg</a>		<a href="#">302_44755_97.txt</a>
4		MACHO 302.44757.19	18 30 34.97, -14 22 49.0	EA	14.80	15.15	R	0.983101	2450323.997	min		<a href="#">Comm. 4</a>	<a href="#">302_44757_19.jpg</a>		<a href="#">302_44757_19.txt</a>
5		MACHO 303.44915.120	18 30 39.67, -15 00 57.7	EW	15.85	16.15	R	0.533749	2449949.003	min		<a href="#">Comm. 5</a>	<a href="#">303_44915_120.jpg</a>		<a href="#">303_44915_120.txt</a>
6		MACHO 302.44923.114	18 30 40.85, -14 28 48.2	EB	15.40	15.73	R	0.797059	2450159.295	min		<a href="#">Comm. 6</a>	<a href="#">302_44923_114.jpg</a>		<a href="#">302_44923_114.txt</a>
7		MACHO 302.44925.203	18 30 40.90, -14 21 35.8	EB	16.30	16.65	R	1.211365	2450576.230	min		<a href="#">Comm. 7</a>	<a href="#">302_44925_203.jpg</a>		<a href="#">302_44925_203.txt</a>
8		MACHO 303.44915.172	18 30 41.33, -15 01 21.6	EB	16.40	16.85	R	0.576992	2450235.148	min		<a href="#">Comm. 8</a>	<a href="#">303_44915_172.jpg</a>		<a href="#">303_44915_172.txt</a>
9		MACHO 302.44930.647	18 30 41.20, -14 00 04.7	EW	17.30	18.05	R	0.308122	2451364.934	min		<a href="#">Comm. 9</a>	<a href="#">302_44930_647.jpg</a>		<a href="#">302_44930_647.txt</a>
10		MACHO 302.44930.54	18 30 42.59, -13 59 40.7	EB	14.55	14.80	R	1.462650	2450308.953	min		<a href="#">Comm. 10</a>	<a href="#">302_44930_54.jpg</a>		<a href="#">302_44930_54.txt</a>
11		MACHO 302.44923.364	18 30 44.71, -14 29 16.9	EW	16.65	17.05	R	0.381247	2450670.949	min		<a href="#">Comm. 11</a>	<a href="#">302_44923_364.jpg</a>		<a href="#">302_44923_364.txt</a>
12		MACHO 303.45082.28	18 31 00.57, -15 04 22.7	EB	13.75	14.25	R	0.832911	2449833.320	min		<a href="#">Comm. 12</a>	<a href="#">303_45082_28.jpg</a>		<a href="#">303_45082_28.txt</a>
13		MACHO 302.45090.327	18 31 08.75, -14 33 53.1	EW	16.55	17.00	R	0.385447	2449926.012	min		<a href="#">Comm. 13</a>	<a href="#">302_45090_327.jpg</a>		<a href="#">302_45090_327.txt</a>
14		MACHO 302.45091.404	18 31 11.47, -14 27 06.2	EB	16.85	17.20	R	0.586156	2450607.205	min		<a href="#">Comm. 14</a>	<a href="#">302_45091_404.jpg</a>		<a href="#">302_45091_404.txt</a>
15		MACHO 301.45107.80	18 31 11.57, -13 24 01.2	EW	16.25	16.70	R	1.097030	2449885.158	min		<a href="#">Comm. 15</a>	<a href="#">301_45107_80.jpg</a>		<a href="#">301_45107_80.txt</a>
16		MACHO 301.45269.635	18 31 12.05, -13 47 27.7	EW	17.15	17.70	R	0.416571	2449926.008	min		<a href="#">Comm. 16</a>	<a href="#">301_45269_635.jpg</a>		<a href="#">301_45269_635.txt</a>
17		MACHO 301.45278.386	18 31 19.35, -13 12 35.8	EW	17.20	17.65	R	0.893200	2450311.053	min		<a href="#">Comm. 17</a>	<a href="#">301_45278_386.jpg</a>		<a href="#">301_45278_386.txt</a>
18		MACHO 301.45439.274	18 31 29.71, -13 40 50.5	EW	16.25	16.60	R	0.386522	2450301.041	min		<a href="#">Comm. 18</a>	<a href="#">301_45439_274.jpg</a>		<a href="#">301_45439_274.txt</a>
19		MACHO 301.45437.135	18 31 36.07, -13 50 37.8	EW	15.05	15.40	R	0.457300	2449918.984	min		<a href="#">Comm. 19</a>	<a href="#">301_45437_135.jpg</a>		<a href="#">301_45437_135.txt</a>
20		MACHO 301.45438.240	18 31 37.81, -13 45 02.8	EB	15.75	16.10	R	1.208095	2449952.011	min		<a href="#">Comm. 20</a>	<a href="#">301_45438_240.jpg</a>		<a href="#">301_45438_240.txt</a>
21		MACHO 301.45606.365	18 31 47.20, -13 45 39.1	EW	16.55	16.90	R	0.416897	2450594.111	min		<a href="#">Comm. 21</a>	<a href="#">301_45606_365.jpg</a>		<a href="#">301_45606_365.txt</a>
22		MACHO 303.45586.304	18 31 47.51, -15 04 01.3	EA	16.45	16.95	R	1.790722	2450654.026	min		<a href="#">Comm. 22</a>	<a href="#">303_45586_304.jpg</a>		<a href="#">303_45586_304.txt</a>
23		MACHO 301.45607.33	18 31 48.75, -13 41 49.2	EW	13.45	13.75	R	0.482642	2449924.938	min		<a href="#">Comm. 23</a>	<a href="#">301_45607_33.jpg</a>		<a href="#">301_45607_33.txt</a>

24	MACHO 303.45587.484	18 31 50.12, -14 59 17.6	EW	17.05	17.50	R	0.473530	2449927.940	min	<a href="#">Comm. 24</a>	<a href="#">303_45587_484.jpg</a>	<a href="#">303_45587_484.txt</a>
25	MACHO 301.45612.194	18 31 55.09, -13 19 29.8	EB	16.00	16.45	R	0.747776	2449789.259	min	<a href="#">Comm. 25</a>	<a href="#">301_45612_194.jpg</a>	<a href="#">301_45612_194.txt</a>
26	MACHO 302.45597.140	18 31 55.57, -14 19 19.1	EW	16.05	16.45	R	0.414081	2450547.300	min	<a href="#">Comm. 26</a>	<a href="#">302_45597_140.jpg</a>	<a href="#">302_45597_140.txt</a>
27	MACHO 302.45596.172	18 31 56.54, -14 26 42.3	EB	16.05	16.45	R	1.293166	2451279.151	min	<a href="#">Comm. 27</a>	<a href="#">302_45596_172.jpg</a>	<a href="#">302_45596_172.txt</a>
28	MACHO 302.45598.289	18 31 57.64, -14 15 29.8	EB	16.35	16.80	R	0.820005	2450578.181	min	<a href="#">Comm. 28</a>	<a href="#">302_45598_289.jpg</a>	<a href="#">302_45598_289.txt</a>
29	MACHO 303.45750.39	18 32 03.67, -15 19 05.4	EB	16.70	17.08	R	0.649236	2450316.020	min	<a href="#">Comm. 29</a>	<a href="#">303_45750_39.jpg</a>	<a href="#">303_45750_39.txt</a>
30	MACHO 301.45773.228	18 32 05.49, -13 47 41.9	EW	16.00	16.40	R	0.805427	2449856.254	min	<a href="#">Comm. 30</a>	<a href="#">301_45773_228.jpg</a>	<a href="#">301_45773_228.txt</a>
31	MACHO 303.45755.445	18 32 05.65, -15 00 57.3	EW	16.95	17.30	R	0.448937	2450606.134	min	<a href="#">Comm. 31</a>	<a href="#">303_45755_445.jpg</a>	<a href="#">303_45755_445.txt</a>
32	MACHO 301.45779.145	18 32 05.62, -13 25 39.0	EA	15.65	15.95	R	1.921038	2451284.228	min	<a href="#">Comm. 32</a>	<a href="#">301_45779_145.jpg</a>	<a href="#">301_45779_145.txt</a>
33	MACHO 301.45775.487	18 32 07.29, -13 40 20.5	EW	16.90	17.35	R	0.429691	2450567.192	min	<a href="#">Comm. 33</a>	<a href="#">301_45775_487.jpg</a>	<a href="#">301_45775_487.txt</a>
34	MACHO 301.45775.220	18 32 10.81, -13 39 53.5	EW	15.90	16.25	R	0.440278	2450215.143	min	<a href="#">Comm. 34</a>	<a href="#">301_45775_220.jpg</a>	<a href="#">301_45775_220.txt</a>
35	MACHO 301.45772.498	18 32 13.10, -13 53 17.0	EW	17.45	17.95	R	0.409893	2449922.098	min	<a href="#">Comm. 35</a>	<a href="#">301_45772_498.jpg</a>	<a href="#">301_45772_498.txt</a>

**Comments:**

1. MinII = 16.45.
2. MinII = 16.75.
3. MinII = 15.55.
4. MinII = 15.05.
5. MinII = 16.15.
6. MinII = 15.50.
7. MinII = 16.55.
8. MinII = 16.55.
9. MinII = 17.90. The coordinates are from the GSC2.3 catalogue (Lasker et al. 2008).
10. MinII = 14.75.
11. MinII = 17.00.
12. MinII = 13.85.
13. MinII = 16.95.
14. MinII = 17.05.
15. MinII = 16.70.

16. MinII = 17.70. The horizontal line is an artefact of the data, it cannot be removed without damaging the data for the star.

17. MinII = 17.60.

18. MinII = 16.55. The horizontal line is an artefact of the data, it cannot be removed without damaging the data for the star.

19. MinII = 15.40.

20. MinII = 16.00.

21. MinII = 16.85.

22. MinII = 16.70.

23. MinII = 13.70.

24. MinII = 17.40.

25. MinII = 16.30. The horizontal line is an artefact of the data, it cannot be removed without damaging the data for the star.

26. MinII = 16.40.

27. MinII = 16.15.

28. MinII = 16.60.

29. MinII = 16.95.

30. MinII = 16.35.

31. MinII = 17.30.

32. MinII = 15.95.

33. MinII = 17.30.

34. MinII = 16.20. The horizontal line is an artefact of the data, it cannot be removed without damaging the data for the star.

35. MinII = 17.90.

### **Remarks:**

The first part of this study was published by Bernhard and Greaves (2010).

Presented are the details for thirty five eclipsing variables found from the Scutum MACHO Galactic Bulge fields 301-303 epoch photometry as publicly served via their new Virtual Observatory interface (Smillie 2009) and as downloaded and sourced via TOPCAT.

Each object was checked against the Strasbourg CDS VizieR service and the International Variable Star Index (<http://www.aavso.org/vsx/>) for pre-existence as an eclipsing binary in variability catalogues.

The astrometric positions were derived from the Carlsberg Meridian Catalog 14 (CMC14 2006) and 2MASS (Skrutskie et al. 2006) if available. The Macho R magnitudes were calculated from the instrumental R magnitudes using the formula given in Alcock et al. (1999). The programmes AVE (GEA) and Period04 (University of Vienna) were used for the data analysis.

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### **References:**

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