ASAS 164802-6715.2: Identification of Its Two Eclipsing Binaries

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#	Name	Other	Coord (J2000)	Type	Max	Min	System	Period	Epoch (JD)	type	Sp	Comment	L.Curve	Find.Chart	Data
1		2MASS J16480306-6715178	16 48 03.08, -67 15 17.9	EA	11.19	11.45	V	1.59339	2455722.029	Min		[Comm. 1](#)	[1.gif](#)	[chart.gif](#)	[Data_EA.txt](#)
2		2MASS J16480119-6715102	16 48 01.20, -67 15 10.3	EW	11.34	11.76	V	0.4225126	2455697.061	Min		[Comm. 2](#)	[2.gif](#)		[Data_EW.txt](#)

Comments:

The variable star catalogued as ASAS 164802–6715.2 by Pojmanski (2002) was found to display two types of eclipsing variability by Pilecki and Szczygiel (2007). In this case the additional variability was interpreted as a result of the blending of two nearby stars. This is confirmed by our results.

1. 2MASS J16480306–6715178 = TYC 9050 00298 1 is identified as an EA-type eclipsing binary (labelled Star A in the finding chart). Its colors at maximum are: B–V = 0.52; V–I = 0.58 (this paper) and J–K = 0.28 (2MASS, Skrutskie et al. 2006). Min II = 11.25V.

2. 2MASS J16480119–6715102 (labelled Star B in the finding chart) is 14" away from the EA-type variable. Its colors are remarkably similar to the EA star: B–V = 0.52; V–I = 0.59 (this paper) and J–K = 0.28 (2MASS). Min II = 11.74V.

Remarks:

All Observations were carried out using a Meade 12 Schmidt-Cassegrain GPS telescope located at Carnes Hill Observatory. The cameras used were either an SBIG ST402 ME utilising the custom built SBIG BVIc photometry filter set, or an SBIG ST9 XE camera utilising SBIG filter wheel and Custom Scientific BVRcIc photometric filters. Observations were mostly carried out using the ST402 with the ST9 used on at least one occasion. Differential photometry from the two cameras has been found to be in agreement to within 0.03 magnitudes provided the same comparison star is used. Transformed photometry is generally in agreement to 0.01 magnitudes or better. Instrumental magnitudes were extracted using AIP4WIN 2.0 by carefully selecting appropriate apertures that excluded any surrounding stars. Magnitudes and colours are transformed to the standard system using E532, E631 and E765 from the field of Southern E standards. The comparison stars (identified in the finding chart) used were:
Comp 1 = TYC 9050 00067 1; 16 48 12.76, –67 13 11.8 (J2000); V = 11.13; B–V = 1.46; V–I = 1.49.
Comp 2 = TYC 9050 01557 1; 16 48 56.38, –67 15 41.1 (J2000); V = 10.39; B–V = 0.98; V–I = 1.04.
The data for Star A and B has been obtained using Comp Star 2 between HJD 2455709.956 and 2455710.089 and between 2455718.005 and 2455718.096. All other data was obtained using Comp Star 1. The elements were determined by combining our datasets with the ASAS-3 observations available at the following URL: http://www.astrouw.edu.pl/cgi-asas/asas_variable/164802-6715.2,asas3,0,0,500,0,0. Pre-whitening was applied using Period04 (Lenz and Breger 2005) to separate each frequency of variability found in ASAS-3 data but light contamination between the two stars causes very large scatter in the results. The ASAS-3 amplitude has been corrected in each case for the light contamination by the

companion using the V-magnitudes of each component as a reference. Finally the observations have been shifted to match the V-magnitude of each of the variable stars. ASAS-3 datapoints during the EA-eclipse have not been used for the EW light curve.

References:
Lenz, P., Breger, M., 2005, Comm. in Asteroseismology, 146, 53
Pilecki, B., Szczygiel, D.M., 2007, IBVS, No. 5768
Pojmanski, G., 2002, Acta Astronomica, 52, 397
Skrutskie, M.F., Cutri, R.M., Stiening, R., et al., 2006, Astron. J., 131, 1163