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NEW PHOTOELECTRIC MINIMA AND LIGHT ELEMENTS OF MM HERCULIS

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The variability of the RS CVn type eclipsing binary MM Herculis (BD +22°3245, HD 341475) was discovered by Tsesevich (1954). Previous observational data were well studied up to now by several authors. The last period analysis of MM Her was made by Evren (1985) and the light elements of the system were computed.

The observations in Johnson's B, V, R filters were made at the Ege University Observatory in 1998 and 1999. The new light curves obtained from these observations have been published by Taş (2000). The times of four primary minima obtained in this study are listed in Table 1.

The $O-C$ (I) residuals in Table 1 were computed from the light elements given by Evren (1985) as

$$\mathrm{HJD}_{\mathrm{minI}} = 2445551.4336 + 7\overset{\mathrm{d}}{.}960358 \times E.$$

The least squares solution has been computed from all photoelectric minima given by Hall and Kreiner (1980), Evren (1985) and this study, and the new light elements were derived as follows:

$$\begin{array}{rcl} \mathrm{HJD}_{\mathrm{minI}} = 2445551.4274 & + & 7\overset{\mathrm{d}}{.}960326 \times E. \\ \pm 7 & & \pm 2 \end{array}$$

The $O-C$ (II) residuals were computed using these new light elements and all of them have negative sign. These residuals were plotted against cycle values (E) and are shown in Figure 1.

As seen from Figure 1, the $O-C$ (II) residuals may be represented with a sine-like variation. Our values (filled circles in Figure 1) are seen on the descending branch of this variation. This variation can either be the result of a light-time effect or magnetic activity. Our studies concerning the third body orbit and the physical parameters of the third companion being continued and will be discussed elsewhere.

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Hall, D.S. and Kreiner, J.M., 1980, *Acta Astron.*, **30**, 387
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Table 1: Times of new primary minima for MM Her

JD (Hel.) (24 00000+)	E	$O-C$ (I) (day)	$O-C$ (II) (day)	Filter
50956.48586	679	−0.03082	−0.00288	V
50956.48592	679	−0.03076	−0.00282	B
50956.48615	679	−0.0305	−0.0026	R
50964.44694	680	−0.0301	−0.0021	R
50964.44701	680	−0.0300	−0.0021	V
50964.44801	680	−0.0290	−0.0011	B
51362.45861	730	−0.0363	−0.0067	V
51362.45949	730	−0.0354	−0.0059	R
51362.46187	730	−0.0331	−0.0035	B
51378.38174	732	−0.0339	−0.0043	R
51378.38212	732	−0.0335	−0.0039	B
51378.38272	732	−0.0329	−0.0033	V

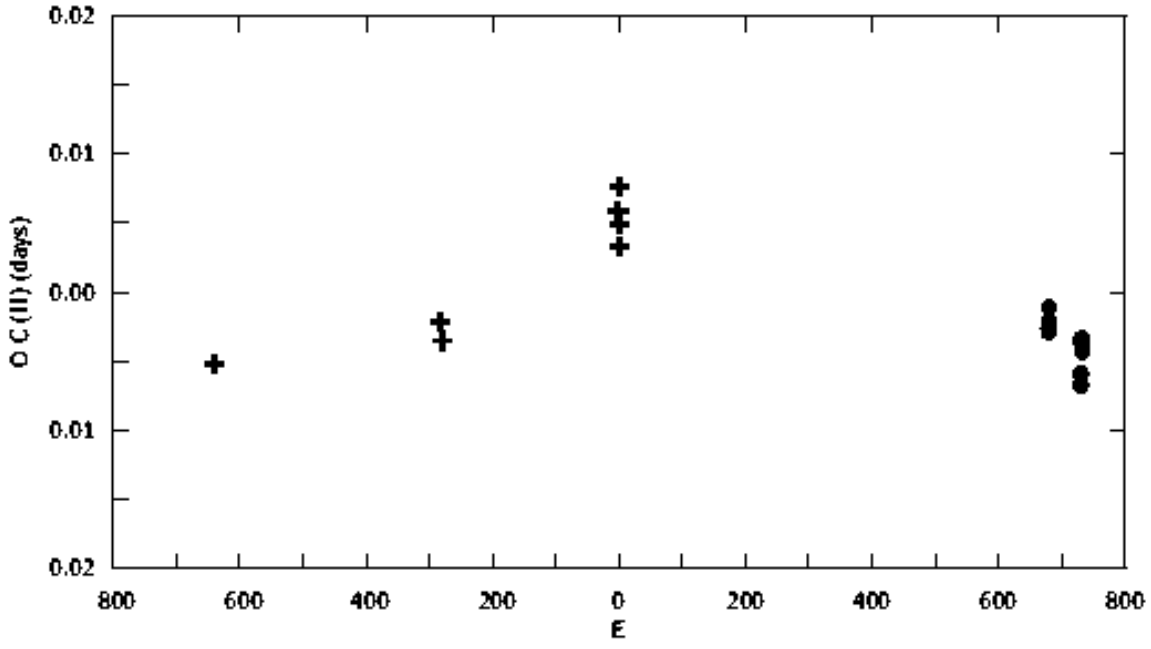

Figure 1. The $O-C$ (II) variation of MM Her. The symbols of plus and filled circle represent the data taken from literature and this study, respectively.