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THE SECONDARY PERIOD OF THE RRab STAR SZ Hydrae

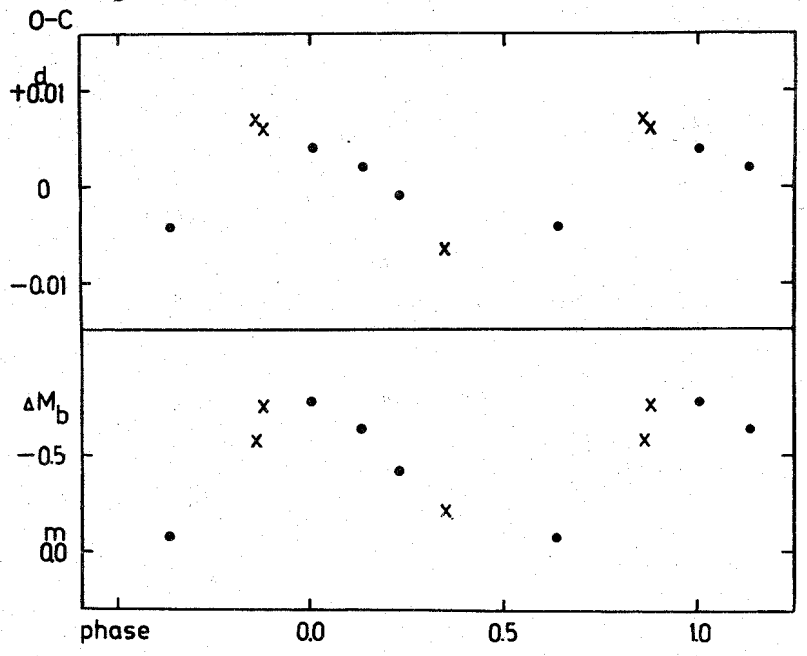
Inspired by a notice of L.J.Robinson (Per.Zv. V.16. No.1.,p.62, 1966) on a possible Blashko effect in the light variation of SZ Hya I initiated photoelectric observations of the star during my stay at the Catania Astrophysical Observatory on Aetna in spring 1970 in order to determine the length of its secondary period.

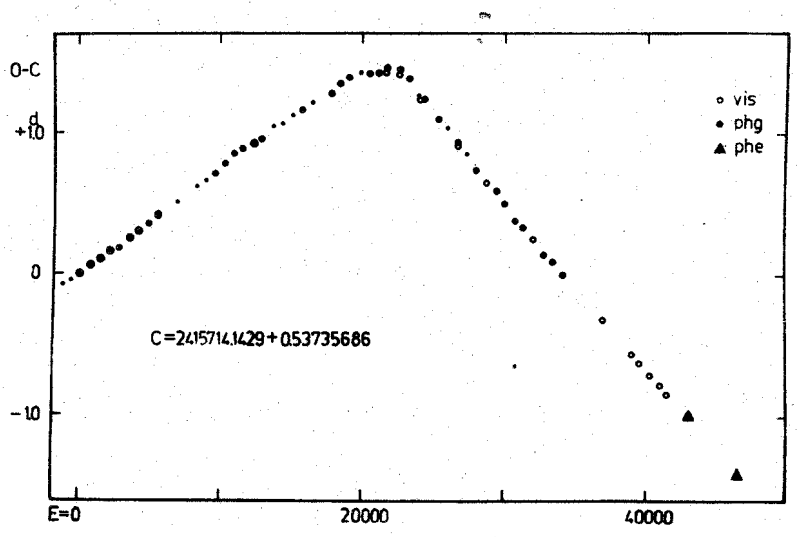
The observations were carried out with the quasi-Cassegrain reflector of 61 cm aperture and 600 cm focal length, equipped with an EMI 6256 photomultiplier tube.

Although only four maxima could be obtained, their favourable distribution in phase enabled the determination of the secondary period. The result is:

$$P_s = 25^d.8$$

Only Z CVn has a shorter secondary period among the RRab stars (P_s= 22^d.75, Inf.Bull.Var.Stars No.146, 1966).





The table contains the observed maxima in two colours $(\Delta)M_y$, $(\Delta)M_b$ and their O-C values computed with the following elements:

$$\text{Max.hel.} = 2440679{,}412 + 0^d{,}53724022E \qquad (1)$$

Three photoelectric maxima obtained by Arizona observers (Fitch, Wisnewski and H.L.Johnson: Comm. Lunar and Plan. Lab. Numb.71, pp 20-21, 1966) are included in the table.

J.D. max.	O-C	$(\Delta)M_y$	$(\Delta)M_b$
	Arizona observations:		
2438773,828	$+0^d{,}007$	$10^m{,}55$	$10^m{,}50$
810,884	-0.007	11,14	11,04
901,692	+0.008	10,75	10,68
	Catania observations:		
2440679,416	+0.004	-0,350	-0.780
685,321	-0.001	-0.050	-0.420
708,425	+0.002	-0.240	-0.640
721,313	-0.004	+0.240	-0.080

In figure 1 the values of ΔM_b and O-C are plotted against the phase of the secondary period computed by the formula:

$$\text{Max. amp.} = 2440705 + 25^d.8\ N \qquad (2)$$

The Arizona observations indicate the same secondary period. The Arizona magnitudes M_b were adjusted to the Catania magnitudes by shifting them by $-11^m.26$.

Combining their observations with my Catania results, an improved value of $25^d.74$ can be derived for P_s, but the number of elapsed epochs between the two series of observations may be yet in error by ± 1.

Fig.2 shows the O-C diagram for the fundamental period. Points denote the photographic epochs given by Robinson, the circles are visual epochs from Per. Zvj. (see above), the triangles are the epochs obtained at Arizona and Catania, respectively.

I am very grateful to Prof. Godoli for a grant enabling me to carry out observations in the Catania Observatory, and to Drs. C.Blanco, S.Catalano and M.Rodono for helping me in the observations.

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