

COMMISSION 27 OF THE I. A. U.
 INFORMATION BULLETIN ON VARIABLE STARS

Number 2427

Konkoly Observatory
 Budapest
 2 November 1983
 HU ISSN 0374 - 0676

PHOTOELECTRIC H α N AND H α W OBSERVATIONS OF R CMa*

The eclipsing binary system R CMa (BD-16° 1898) was observed in 8 nights from February 18 to March 2, 1983 using a photoelectric photometer mounted on the 51 cm Cassegrain reflector of Biruni Observatory. The photoelectric photometer is equipped with an unrefrigerated RCA 4509 multiplier photocell and a Leeds and Northrup Speedomax was used to record the amplified signal from the photomultiplier. The observations were made using Strömgren H α N and H α W filters possessing characteristics indicated in Table I. The observing sequence was the usual pattern of sky - comparison - variable (3 times) - comparison - sky, with each observation lasting about 50 seconds.

Table I. Filter characteristics

Filter designation	$\lambda(\text{max})(\text{\AA})$	FWHM(\AA)	Max. Transmission
H α W	6583	238	47 %
H α N	6569	38	57 %

BD-15° 1734 was used as the comparison star and BD-15° 1732 was observed once a night as the check star. The effects of differential atmospheric extinction were removed using the extinction coefficients derived from the comparison star observations. The differential corrections were, however, small due to the angular proximity of the variable and comparison stars. Light curves are plotted in Figure 1 where the phases were computed according to the following ephemeris (Koch, 1960):

$$\text{Min I} = \text{HJD } 2422030.638 + 1^{\text{d}}.1359386 \text{ E}$$

but a correction of 0.^d0211 was added to the epoch to bring the recent primary minimum to the 0.0 phase. H α N-H α W index was also computed but no significant phase-dependent variation greater than the observational scatter was observed.

According to Guinan (1977 and 1983) R CMa is an old, high velocity, semi-detached eclipsing binary with mass loss and exchange whose period undergoes changes (an abrupt change in period was observed around 1914) and exhibits

* Contribution No. 10, Biruni Observatory

asymmetry in the light curve. All these suggest that the system should be observed and studied more.

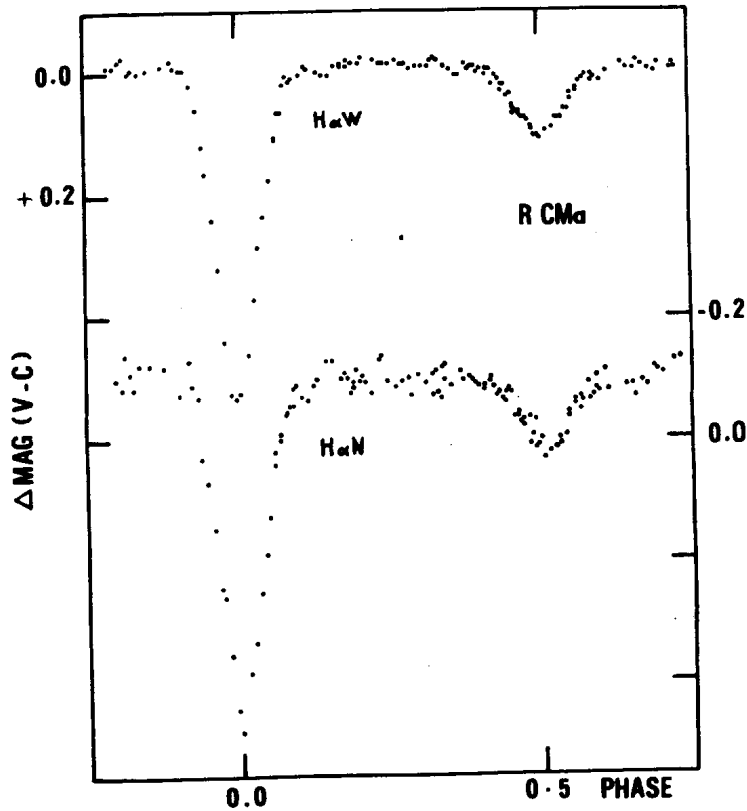


Figure 1. The H α N and H α W light curves of R CMa as a function of orbital phase

We are presently analysing the observed light curves using Kopal's method for partial eclipses (Edalati, 1978). The characteristic parameters of the light curve are given as follows:

$$\text{Min I (observed)} = 2445391.2364 ; \quad \text{O-C} = 0.0211^d$$

Amplitudes:

$$\text{Min I (H}\alpha\text{W)} = 0.545^m, \quad \text{Min II (H}\alpha\text{W)} = 0.120^m$$

$$\text{Min I (H}\alpha\text{N)} = 0.570^m, \quad \text{Min II (H}\alpha\text{N)} = 0.115^m$$

Mean values of $\Delta\alpha(V-C)$ index:

phase interval	$\Delta\alpha(V-C)$
0.97 - 0.03 (Min I)	-0.08 ± 0.01
0.10 - 0.40 (Max I)	-0.08 ± 0.02
0.47 - 0.53 (Min II)	-0.07 ± 0.02
0.60 - 0.90 (Max II)	-0.09 ± 0.03

M.T. EDALATI and B. KHALESSE

Physics Department
School of Sciences
Mashad University
Mashad, Iran

N. RIAZI

Biruni Observatory
Shiraz University
Shiraz, Iran

References:

- Edalati, M.T. 1978, *Astrophys. Space Sci.*, 58, 3.
Guinan, E.F. 1977, *A.J.*, 82, 51.
Guinan, E.F. 1983, *A.J.*, 88, 126.
Koch, R.H. 1960, *A.J.*, 65, 326.