COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 2892

Konkoly Observatory
Budapest
8 May 1986
HU ISSN 0374-0676

HαN AND HαW OBSERVATIONS OF THE ECLIPSING BINARY SYSTEM VV ORIONIS (HR1868)

H-alpha narrow and H-alpha wide observations of the eclipsing binary system VV Orionis were carried out in two sets, during 23 nights from 7 March through 21 April 1983 and in 13 nights from 10 December, 1983 through 10 February, 1984. The observations were obtained using 51 cm Cassegrain reflector equipped with an unrefrigerated RCA 4509 photomultiplier at Biruni Observatory of Shiraz University. Each reading lasted about 50 seconds and the usual pattern SCVVVCS was used in this investigation.

The stars HR1861 (B3V) and HR1873 (B3V) were used as comparison and check stars respectively. There was not considerable change during the observations.

VV Ori (B1V and B4V, m_v=5.3) is an important system among the very few early-type eclipsing binaries for which reliable limb-darkening coefficients can be empirically determined at least for one of its components (Chambliss, 1983).

The observations were made using Strömgren filters HαN (half-width = 38 Å, λmax=6569 Å, Max.transmission=57%) and HαW (half-width =238 Å, λmax = 6583 Å, Max. transmission = 47%).

Figure 1 shows the light curves belonging to the first set of observations. The second set of observations obtained during excellent sky conditions is shown in Figure 2. The composed light curves of the two sets of observations are also represented in Figure 3.

A total of five times of minimum light are obtained according to the ephemeris given by Duerbeck(1975): JD (Hel) Min I = 2442041.6813 + $1^d.48537788E$. These values are given in Table I.

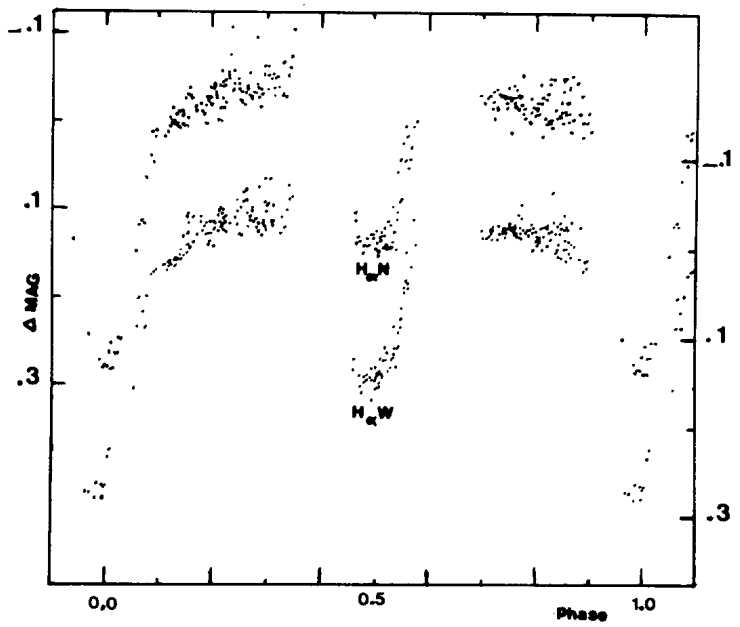

Figure 1 : Light curves of VV Ori (first set of observations)

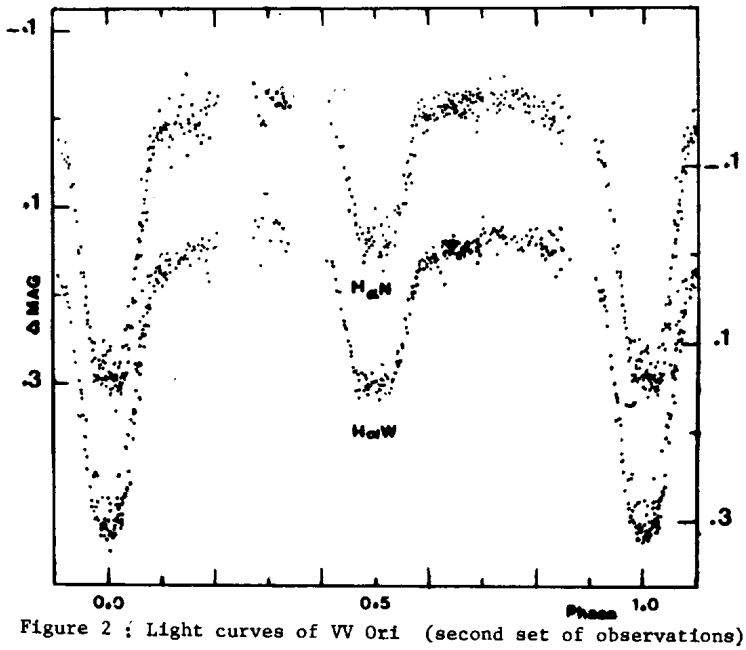

Figure 2 : Light curves of VV Ori (second set of observations)

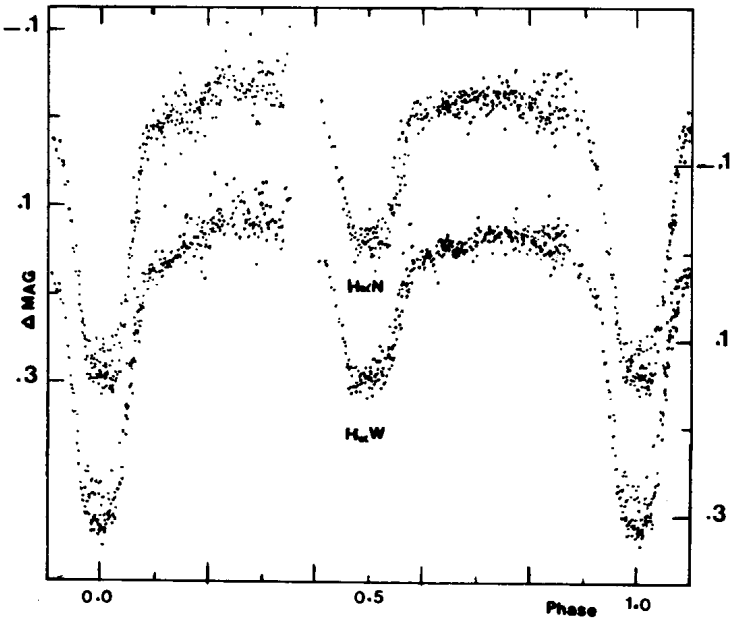

Figure 3 : Composed light curves of VV Ori.

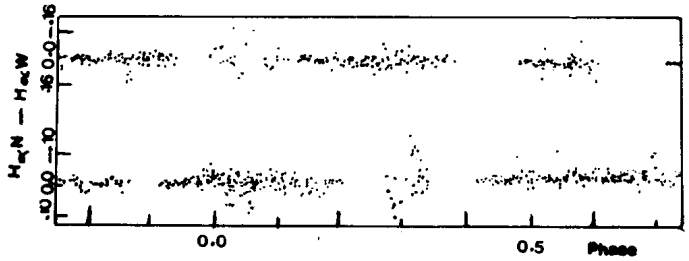

Figure 4 : Color index curves. The upper one belongs to the first set and the lower one belongs to the second set of observations. Scales are slightly different.

Table I. Times of minimum light for VV Ori.

JD 2445000+	E	$(O-C)_1$	$(O-C)_2$
679.3725	2449	+0.0008	0.00083
699.4234	2462.5	-0.0009	-0.00085
717.2494	2474.5	+0.0005	0.00063
737.3006	2488	-0.0009	-0.00075
740.2718	2490	-0.0004	-0.00031

The first set of residuals, $(O-C)_1$, are those obtained using tracing paper method and the second one, $(O-C)_2$, are obtained by means of least squares method. The two methods resulted in very similar residuals and a new minimum time and period is obtained for Duerbeck's epoch.

$$JD(Hel)\ Min\ I = 2442041.6846 + 1^d.48537652\ E$$
$$\pm \quad 4 \quad \pm \qquad\qquad 22\ p.e.$$

The period is very precisely determined to within 0.02 second. There is no evidence for any change of period and all available data indicate that the period of VV Ori has remained constant for at least the past 70 years (Chambliss and Leung, 1982).

Color indices are given in Figure 4. The average value of HαN-HαW is about -0.01 and it decreases to about -0.02 at primary minimum for the second set of observations.

The analysis of the light curves of VV Ori in collaboration with Dr.Carlson R.Chambliss (Kutztown University, Kutztown, USA) is in preparation.

Acknowledgments

I would like to express my sincere gratitude to Dr.Carlson R.Chambliss, from Kutztown University, for providing me with the minimum times. I also offer my thanks to Professor Y.Sobouti and Dr. H.W.Duerbeck for their help.

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