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PHOTOMETRY OF HR 5110

The RS CVn binary HR 5110 (HD 118616, $V = +4.97$) was observed on a total of nine nights in June and July 1979 at Biruni Observatory and at Villanova University Observatory, prompted by the observations of large radio outbursts from the system in late May and June 1979 (Feldman, 1979; Viner, 1979). The Biruni observations were obtained using the 51-cm, $f/13.5$ Cassegrain reflector equipped with an unrefrigerated RCA 4509 multiplier photocell. A Leeds and Northrup Speedomax chart recorder was used to record the amplified photomultiplier output. The Villanova observations were made using a thermoelectrically cooled (-10°C) RCA C31034 Gallium Arsenide photocell attached to the 38-cm reflector. A microprocessor-controlled integrating system recorded the observations (McCook and Maloney, 1979). The comparison star was 25 CVn (HR 5127, $V = +4.84$, A7 III). Matched pairs of intermediate and narrow-band interference filters centered near the Balmer H_{α} line were used at the two stations. The bandpass of the intermediate-band H_{α} filter ($H_{\alpha w}$) is sufficiently broad ($\text{HWHM} \sim 280 \text{\AA}$) to be little affected by the presence of the line feature. The filter characteristics are given in Guinan et al. (1979) and Guinan and McCook (1974) for Biruni and Villanova, respectively. Additional observations were obtained at Biruni using Strömberg y and u filters.

The observing sequence was the usual pattern of sky-comparison-variable-comparison-sky, with each observation typically consisting of a 50 sec deflection. The effects of differential atmospheric extinction were removed. The differential $H_{\alpha w}$, y and u magnitudes in the sense ($V-C$) are given in Fig. 1 as a function of orbital phase, computed from the ephemeris of Burke et al. (1979):

JD Hel. $2443639.52 + 2^d.6131738 \cdot E$

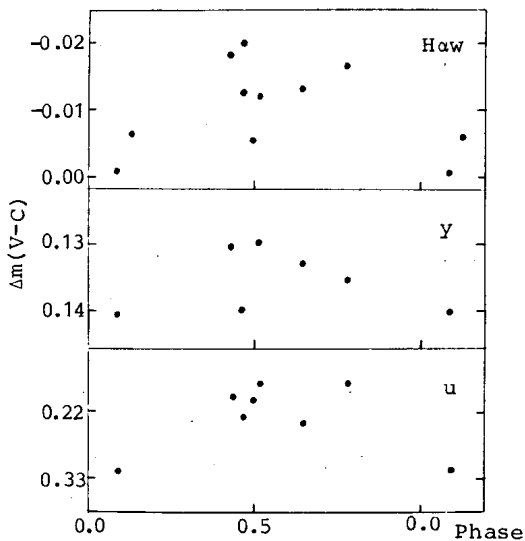


Fig.1. H α , y and u light curves of HR 5110

where zero phase corresponds to the conjunction in which the F-star is farthest from the observer (superior conjunction). H α indices were calculated in the usual manner:

$$\alpha\text{-index} = \text{constant} - 2.5 \times \log \left\{ \frac{\text{flux through narrow-band filter}}{\text{flux through broader-band filter}} \right\}$$

The mean, standardized α -index of the variable is typical for its assumed spectral type of F2 IV (Conti, 1967) so that there is no evidence for H α emission. Bopp and Talcott (1980) have also reported an absence of H α emission. The α index of the comparison is also nominal for its assumed spectral type. Furthermore, a transformation of the y observations indicates no significant change in the V-magnitude of the system since 1977. As can be seen from Fig. 1 the amplitude of the light variation is small, ~ 0.13 mag in H α , with slightly smaller variations in the other two bandpasses, and is about the same as reported by Hall et al. (1978) during 1977-1978. The occur-

rence of minimum light and maximum light at the superior and inferior conjunctions, respectively, of the F-star are in accord with the light variation expected from the reflection effect in a system seen at low inclination. A full discussion will be published later.

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References:

Bopp, B.W., and Talcott, J.C. (1980) *Astron. J.* 85, 55

Burke, E.W., Eaton, J.A., Fisher, G.F., Hall, D.S., Louth, H., Sabria, J.D., Skillman, D.R. (1980) preprint (to be submitted to the *Astron. J.*)

Conti, P.S. (1967) *Astrophys. J.* 149, 629

Feldman, P.A. (1979) *I.A.U. Circ. No.* 3366

Guinan, E.F. and McCook, G.P. (1974) *Pub. Astron. Soc. Pac.* 86, 947

Guinan, E.F., Dorren, J.D., Siah, M.J. and Koch, R.H. (1979) *Astrophys. J.* 229, 296

Hall, D.S., Henry, G.W., Vaucher, C.A., Louth, H., Lovell, L.P., Landis, H.J., Brooks, P., Schlegel, R. and Wasatonic, R. (1978) *Inf. Bull. Var. Stars* No. 1459

McCook, G.P. and Maloney, F.P. (1979) *Bull. Am. Astron. Soc.* 11, 649

Viner, M.R. (1979) *I.A.U. Circ. No.* 3368