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Hβ OBSERVATIONS OF NOVA CYGNI 1975

Hβ photoelectric observations of Nova Cygni 1975 were made at Villanova University Observatory during the period 8 September 1975 to 7 December 1975. The observing instrumentation consisted of the 38 cm telescope and photoelectric photometer equipped with an uncooled EMI 9558 QB photomultiplier tube. The sensitivity of the system was monitored by observations of an internal Sr 90 Cerenkov light source. Interference filters, of both narrow and intermediate bandpass, centered near the wavelength of the Hβ line, were used for the observations. The characteristics of these filters have been tabulated by Guinan and McCook (1974). Note that the Hβ filter is similar to that utilized by Crawford (1960) to define the Hβ system.

BD $+47^{\circ}3292$ (m_v=4.6) was chosen as the comparison star, while BD $+47^{\circ}3348$ (m_v=6.3) served as the check star to monitor the constancy of the comparison star. For observations made after 7 October 1975, this situation was reversed, with BD $+47^{\circ}3348$ acting as the comparison, and BD $+47^{\circ}3292$ acting as the check. This was necessitated by the large decrease in magnitude of the nova during the observation period. On several nights, differential magnitudes were obtained for the two reference stars in both filters and the appropriate correction applied to the post 7 October 1975 observations, thus referencing all (v-c) calculations to BD$+47^{\circ}3292$. The effects of atmospheric extinction were removed from all observations. No significant variations were noted between the reference stars.

Figure 1 presents the nightly mean differential magnitudes, computed as (v-c) = (Nova Cygni 1975 - BD $+47^{\circ}3292$), obtained with the Hβ narrow (Hβ n) and the Hβ intermediate (Hβ w) filters, plotted against Julian Date. The change in magnitude during the period plotted (9 September 1975 to 11 November 1975) amounted to a decline of $2^{m}.88$ in the Hβ w filter and $3^{m}.86$ in the Hβ n filter. Figure 2 is a plot of the nightly mean Hβ index versus

Julian Date. This index is expressed in magnitudes and is computed in sense:

$$H\beta \text{ index} = H\beta \text{ n} - H\beta \text{ w}$$

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Crawford, D.L. 1960, Ap. J., 132, 66.
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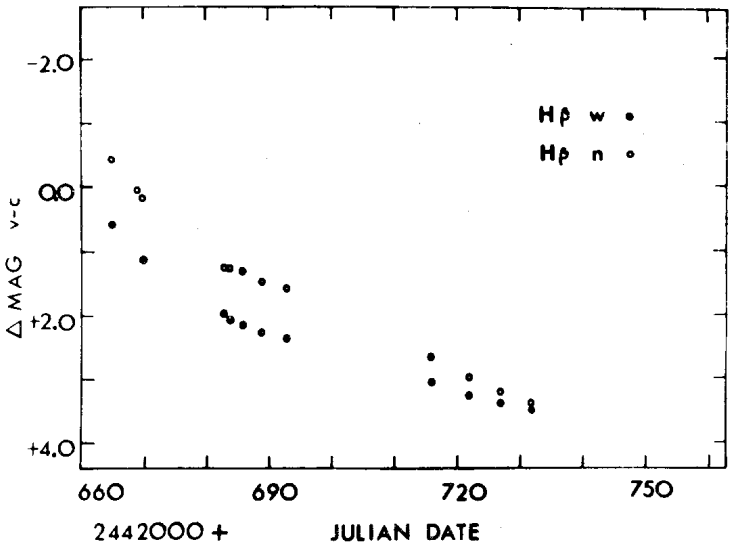

Fig.1. Nightly mean differential magnitudes (v-c) vs. Julian Date, for both Hβn and Hβw filters.

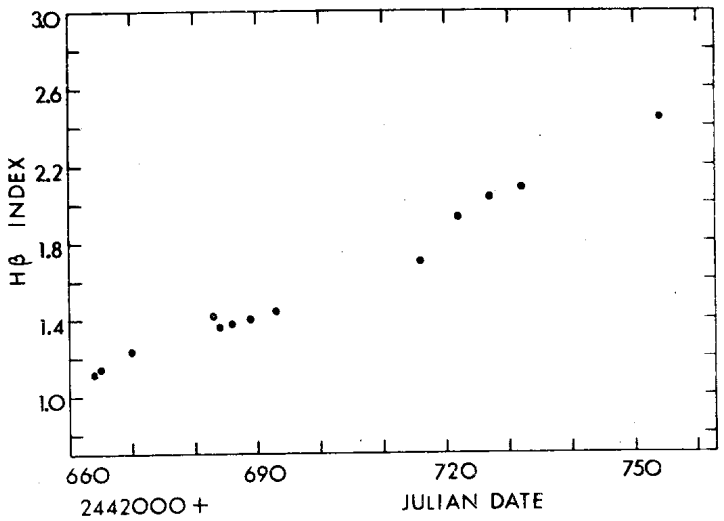

Fig.2. Nightly mean Hβ index vs. Julian Date. Note that the index is expressed in magnitudes and Hβ emission decreases as index becomes more positive. This index is computed as Hβ index = Hβn-Hβw, and due to the 180 A half-bandwidth of the Hβw filter, also reflects changes in the continuum around the Hβ line, as well as changes in the line itself.