

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

Number 1261

Konkoly Observatory  
Budapest  
1977 April 8

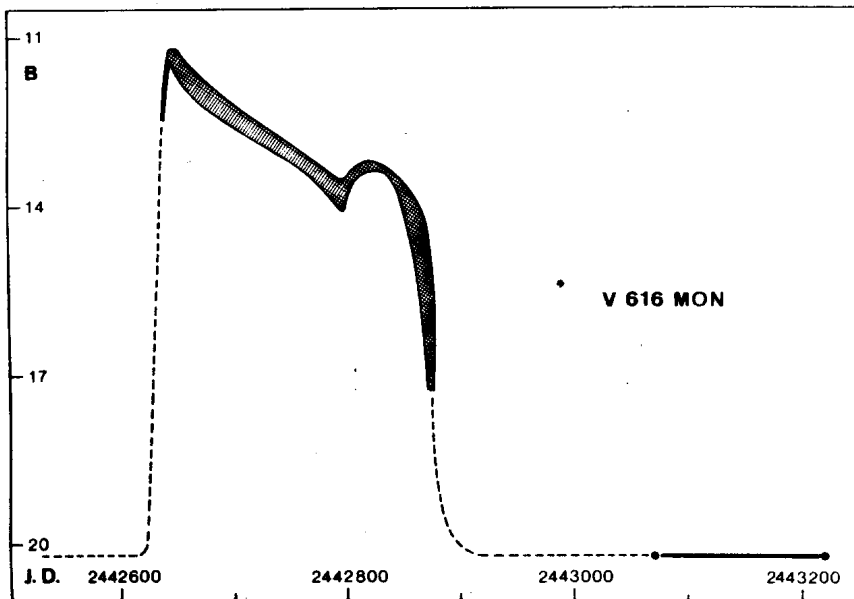
THE OPTICAL COUNTERPART OF A06.20-00 AT MINIMUM

The transient X-ray source A06.20-00 has been identified with a variable star, then named V 616 Monocerotis. The peculiarity of this object is due to its simultaneous X-ray and optical brightening (see e.g. Ciatti et al., 1977). Only another similar case has been recently reported by Murdin et al. (1977).

We recall that the observed properties of V 616 Mon, following the X-ray event, excluded its previous designation as Nova Mon 1975. The most widely accepted model requires a late-type star in binary system, where the increase of about 8 mag is due to optical reverberation of the X radiation originated in a compact companion.

From October 1976 to March 1977 we have obtained a new series of blue, yellow and red photographs of the variable with the 182cm and 122cm telescopes of the Asiago Astrophysical Observatory. On these plates V 616 Mon appears as a star of faint magnitude being again at minimum, as before the outburst. On the Palomar Sky Survey prints (1955) it shows almost the same brightness when compared with nearby stars. We have thought of interest to measure its magnitude and color in this phase, to have a better picture of its normal characteristics, lacking spectroscopic observations at this low luminosity.

We have used as comparison stars those in the clusters NGC 2158 (B and V) and NGC 2236 (R), for which photometric data are published by Arp and Cuffey (1962)



and Rahim (1970). The following magnitudes have been derived with the Becker iris photometer :

$$B = 20.20 \quad , \quad V = 18.25 \quad , \quad R = 17.00$$

At this magnitude level, the estimated error of our measurements is  $\pm 0.20$  mag, but for the visual ( $\pm 0.35$  mag) for which we have only one plate.

The given values are to be compared with those reported for the star before maximum, as follows :

|                    |                |                               |                      |
|--------------------|----------------|-------------------------------|----------------------|
| $B \sim 20.5$      | $B-R \sim 3.6$ | eye estimate ( $\pm 0.5$ mag) | Ward et al. (1975)   |
|                    | $R \sim 17.5$  | eye estimate                  | Boley et al. (1976)  |
| $B = 20.2 \pm 0.3$ |                | compar. with NGC 2158         | Eachus et al. (1976) |

With the present data we can improve our previous estimate on the nature of V 616 Mon. If we assume an interstellar extinction of  $E_{B-V} = 0.4$  mag (Wu et al., 1976), the corrected color index results indeed  $(B-R)_0 = +2.5$  corresponding to that of a normal main sequence star of spectral class K 8 at the distance of 620 pc. Although of lower weight, the color (B-V) is within

the errors consistent with this statement. The hypothesis of a giant star, with a much larger distance outside our galaxy, is to be excluded.

In the Figure we show the blue light curve of the variable (1975-1977), as obtained collecting all the data available in the literature and our minimum observations.

F. CIATTI and A. VITTONI  
Astrophysical Observatory  
I-36012 ASIAGO (Vicenza)  
Italy

#### References

- Arp, H.C., Cuffey, J. 1962, *Astrophys. J.* 136, 51
- Boley, F., Wolfson, R., Bradt, H., Doxsey, R., Jernigan, G., Hiltner, W.A. 1976, *Astrophys. J.* 203, L 13
- Ciatti, F., Mammano, A., Vittone, A. 1977, *Astron. Astrophys.*, in press
- Eachus, L.J., Wright, E.L., Liller, W. 1976, *Astrophys. J.* 203, L 17
- Murdin, P., Griffith, R.E., Pounds, K.A., Watson, M.G., Longmore, A.J. 1977, *Monthly Notices R.A.S.* 178, 27 P
- Rahim, M. 1970, *Astron. Astrophys.* 9, 221
- Ward, M.J., Penston, M.V., Murray, C.A., Clements, E.D. 1975, *Nature* 257, 659
- Wu, C.C., Aalders, J.W.G., Duinen, R.J. van, Kester, D., Wesselius, P.R. 1976, *Astron. Astrophys.* 50, 445