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VY CANIS MAJORIS -- A UNIQUE VARIABLE  
(Preliminary Results)

By accident, the unique variability of Canis Majoris went unrecognized. The object was too faint to be included in Harvard's Milton Bureau, and the observations by Florja, Van Hoof and Deurinck did not span a sufficient time interval.

Recently, at the suggestion of G. Herbig, I observed VY Canis Majoris on about 2,000 plates in the Harvard collection. My sequence was based on photoelectric magnitudes of nearby comparison stars, kindly provided by G. Wallerstein, and extended to fainter stars through Selected Area 147. The average error of one estimate was about 0.1 magnitude. Good coverage on blue plates was available from 1893 to 1954, but adequate yellow plates were available only from 1913 to 1920.

The synoptic light curve (Fig.1) was prepared by plotting all observations, drawing a smooth curve through them, and reading the

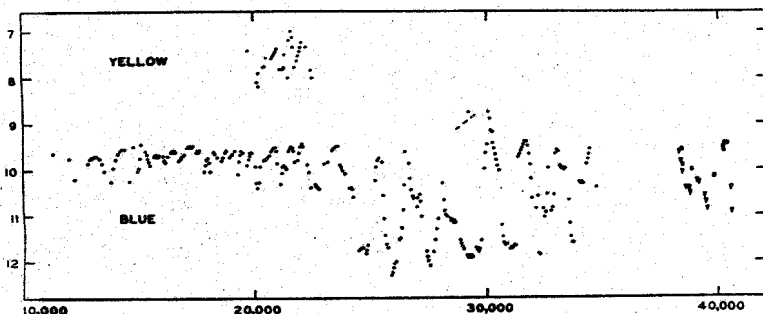


Fig. 1

magnitude at 50-day intervals. The details after 1954 are from 87 observations kindly made by Dieter Friedrich on plates at Remis Observatory (triangles), as well as a few individual photoelectric measurements (boxes).

From about JD 2,411,300 to 22,000 (1889-1919), VY Canis Majoris exhibited variations of less than a magnitude. The cycles ranged from 200 to 1,000 days, with the average length of about 600 days. Then the character of the light curve changed dramatically. At least until the end of the Harvard patrol, longer cycles persisted, 400 to 1,900 days, with an average of 1,100 days. Though the range became as large as three magnitudes, a tendency for diminishing amplitude seems to have prevailed since JD 30,000. Note also the brightening trend of the major minima, about 0.1 magnitude per 1,000 days.

Probably the best evidence that the relatively minor features of the photographic light curve are real is the agreement between it and the yellow curve between 1913 and 1920.

VY Canis Majoris becomes redder as it fades. The large dots in Fig. 2 are photoelectric measurements; unfortunately they were all made when the star was bright. The other dots are from my data, determined from pairs of yellow and blue plates that were taken within five days of each other. Open circles indicate uncertain values.

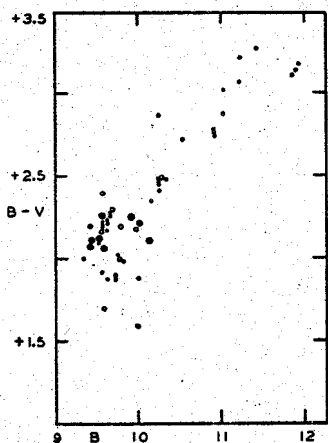


Fig. 2

Details of the brightest maximum and faintest minimum are also shown. Each dot represents an individual magnitude estimate. Note in Fig. 3 the sudden rise of nearly one magnitude at JD 30,000. In Fig. 4 there are indications of more frequent short-term activity, particularly the well-defined peak at JD 25,650 and the marked dip at JD 26,350.

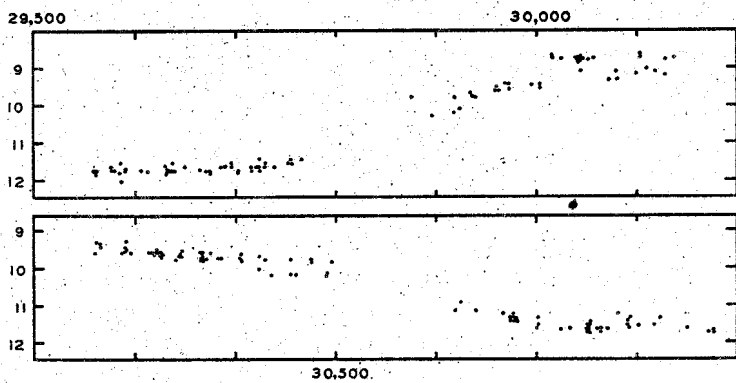


Fig. 3

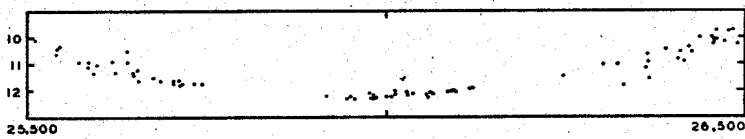


Fig. 4

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