

REVISED PERIOD AND AMPLITUDE CHANGE
FOR V802 CYGNI

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Abstract

Recent work on V802 Cygni indicates a period and amplitude change.

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V802 Cygni ($\alpha = 19^{\text{h}} 35^{\text{m}} 59^{\text{s}}$, $\delta = 34^{\circ} 56'.6$, 1900), an RR Lyrae star demonstrating the Blazhko phenomenon, was reported by Miller in 1957 to have a period of 0.59560285 day. This result was based on data from the years 1922 - 1955.

During the summer of 1981, I examined V802 Cyg on plates taken at the Maria Mitchell Observatory during the interval 1967 - 1981. When the light curves were plotted, an interesting aspect of this star was revealed. There appears to be a very distinct change in the amplitude of variation for this star. As can be seen in the graph of the light curve in Figure 1, the variable star had a low amplitude in 1968 - 1974 and a high amplitude in 1975 - 1981. The period used in plotting each light curve represents the best fitting period for those years.

Attempting to apply Miller's period to my data showed that the period of V802 Cyg has changed considerably since the time of Miller's work. Thus, the period had to be redetermined for these years. Due to the nature of the star, not one period was sufficient to cover the range of years that was studied. In fact, three different periods were found for three subsections of the years 1967 - 1981. These periods are summarized in Table I.

The graph of observed minus computed (O-C) phase of the light variation, Figure 2, clearly shows the three groups of years having different periods. As the period was not constant for each successive year, the period determined for each subgroup of years represents the best fitting period obtainable. The period for the years 1968 - 1970 was found to be 0.595447 day. The period for 1971 - 1974 was 0.595635 day. These final periods were determined by graphically applying a correction to the period that was used in plotting the O-C diagram shown. The third period that was determined represents the years 1975 - 1981, and was found to be $0.595482 \pm 8 \times 10^{-6}$ day. A least squares solution was used for this group of years.

An attempt was made to bridge Miller's work by using his published Julian dates of maximum light with my O-C diagram. Unfortunately, there is a gap of about 12 years with no available data. Therefore it is impossible to predict what the star had been doing during this period. It would be interesting to look at V802 Cygni again at a future date.

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REFERENCE

Miller, W. J. 1957, Ric. Astron. 13, No. 16, 438-443.

TABLE I Periods of V802 Cygni Determined for Three Groups of Years

<u>Period (Days)</u>	<u>Years</u>
0.595447	1968-1970
0.595635	1971-1974
$0.595482 \pm 8 \times 10^{-6}$	1975-1981

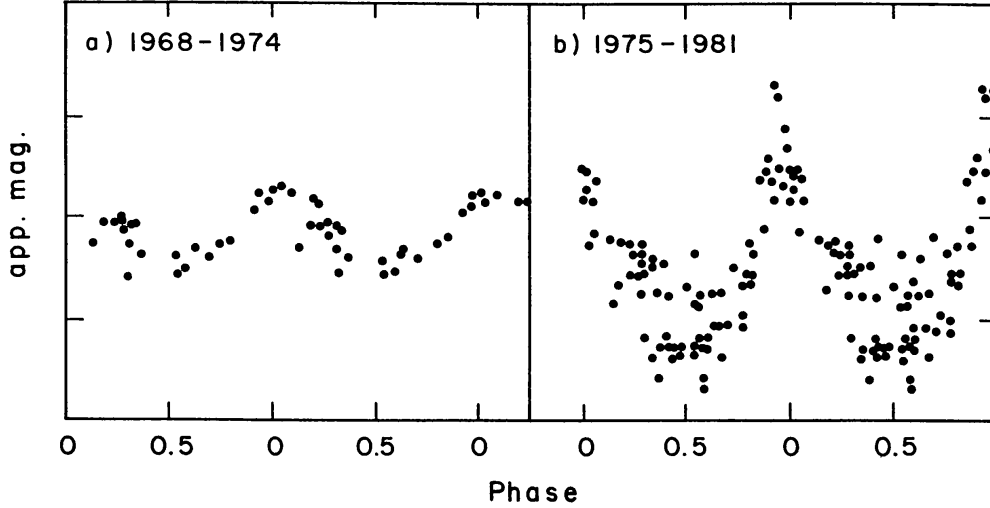


Figure 1. Light curves of V802 Cyg showing change in amplitude of variation. The epoch used in plotting both curves is JD 2444433.817. The period used for plotting the data from 1968-1974 is 0.595635 day and for 1975-1981 is 0.59548 day. The vertical axis represents a magnitude scale of 1 magnitude/division.

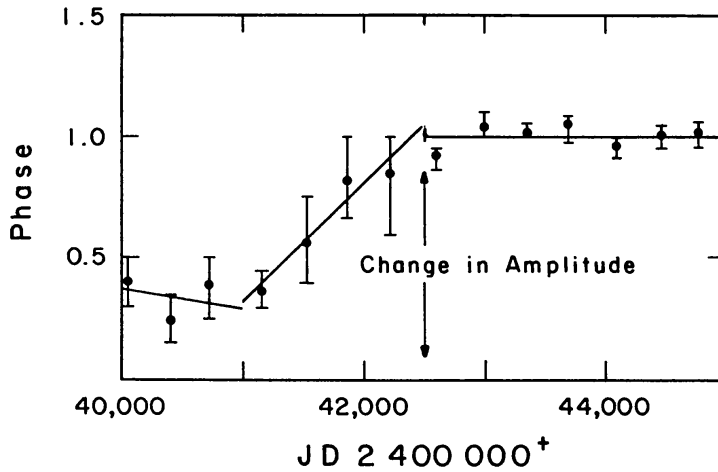


Figure 2. O-C diagram for years 1968-1981. The period used is 0.59548 day and the epoch is JD 2444433.817. The three different lines running through the observations represent the corrections to the phase. The vertical bars are an estimated range in uncertainty for the determined times of maxima.