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A PRELIMINARY REPORT ON THE FLARE ACTIVITY
OF THE U Gem-TYPE STAR VY Scl

1. Introduction

Iriarte and Chavira (1957) were the first who discovered the star to be variable. In the course of the search for faint blue stars in high southern latitudes, Luyten and Haro (1957) found that the range of this star, designated as SPC VAR.4, was at least 4 mag. Haro (1959) suggested that it was similar to the U Gem-type stars (or SS Cyg-type variables). Haro and Chavira (1960) and Pişmiş (1972) studied photographic material and concluded that VY Scl can be classified as an R CrB-type star. Pişmiş' material showed two minima of roughly 4.5 mag deep with an interval of 600 days. In the maximum, at the 13th mag, VY Scl showed an irregular variability of 0.75 mag. However he cites Herbig who concluded that the spectral characteristics are not like those of any R CrB-type star.

2. The Observations

The observations have been made with the Walraven five-colour simultaneous photometer, attached to the 90-cm Light-Collector of the Leiden Southern Station (at the Republic Observatory Annexe) Hartbeestpoortdam, South-Africa, during several nights in June and July 1973. The variable, during that time around the 13.5 mag, was compared with the 11th mag star close to it and marked on Pişmiş finding chart as the brightest star. In four nights of observing the star longer than half an hour, it showed intensive flare activity and in a very short time. A tentative reduction of the longest run is shown in Fig.1 for the B and U passbands of which the effective wave lengths are 4260 and 3620 Å respectively (Walraven and Walraven, 1960; Rijf, Tinbergen and Walraven, 1969). Generally the integration time for the variable was 1.5 min. and for the comparison star 0.5 min. The differences variable star minus comparison star are given in log intensity. The variable exhibits a relatively high U intensity, while the amplitude of the flares is nearly twice that in B. During the time span of over one month the average brightness of the star was more or less constant.

3. Discussion

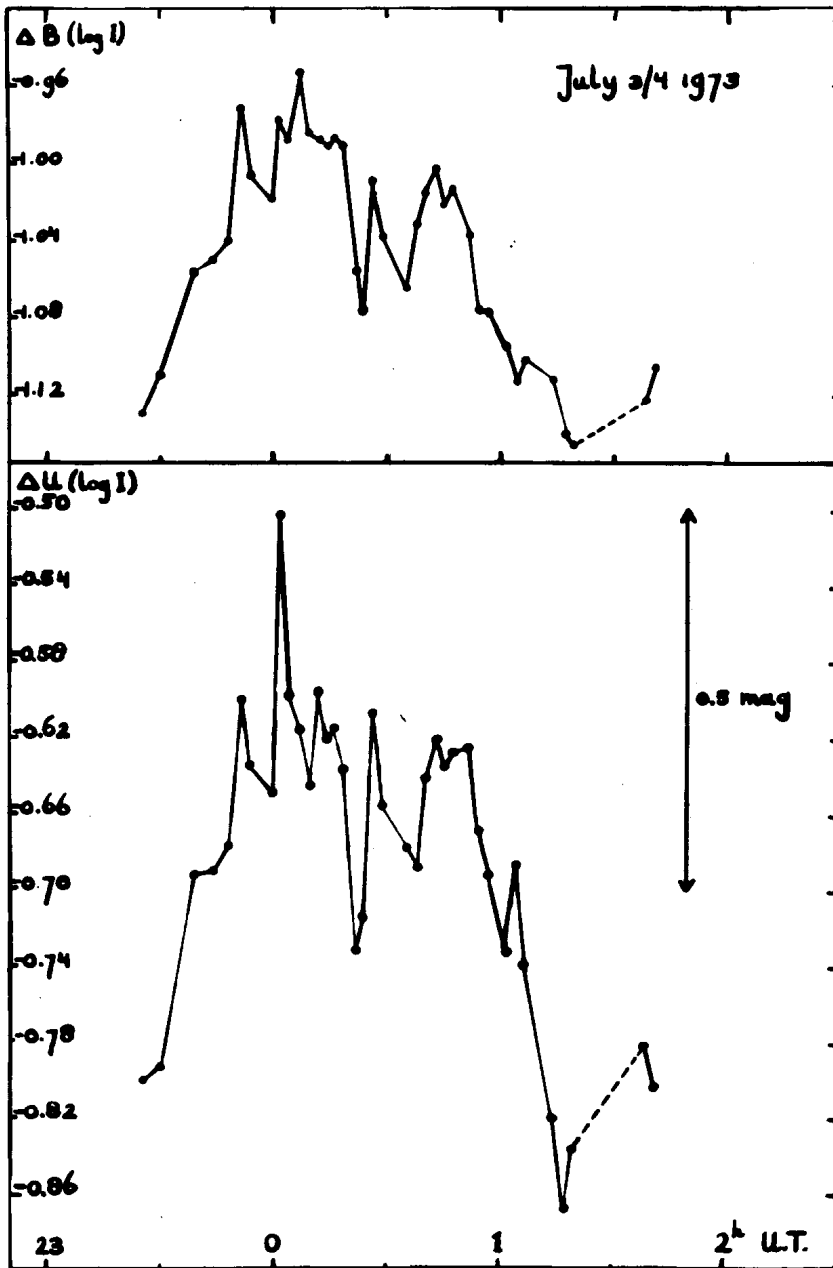
Because of the relatively high U intensity, the absence of any R CrB spectral characteristics and the very short time scale of the sudden outburst, VY Scl might be classified as an U Gem-type star (or SS Cyg-type), which are all small double star systems, one component being a white dwarf while the other is an underluminous later type star, which overflows its inner Lagrangian surface. The ejected material forms a ring or disk around the blue star (Kraft, 1962). New ejected material falling into the ring or disk can result in a hot spot and irregularities in the amount of infalling mass explain the sudden light outburst. This seems to be supported by recent spectroscopic observations by Feast (private communication), who found no spectral changes at all during several hours of observing. The strong decrease in intensity reported by Pişmiş might be the result of a decrease in mass exchange. VY Scl would be a very valuable object to observe with a high speed photometer.

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Fig. 1



The brightnesses VY Scl minus comparison star (in log intensity) plotted against universal time for the B- (4260 Å) and U- passbands (3620 Å).