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SEVEN COLOUR PHOTOMETRY OF THE DELTA SCUTI STAR 27 Vir

27 Vir (HR 4824, A5, V=6.30) was observed during 5 hours in 1975 by Bartolini et al. (1975). They suggested that the star is a Delta Scuti variable with a period of $0^d.05$. We planned to monitor this star during a two week observing run in the second part of February 1977, but due to bad weather good measurements could only be obtained during the nights of February 26/27 and 27/28. The star was observed differentially using the Geneva U B V B₁B₂V₁G photometer attached to the 1-meter telescope of Observatoire de Lyon at Gornergrat Observatory. Comparison stars were HR 4861 (AOV, V=6.4) and HR 4855 (A3, V=6.05).

During the night of February 26 ten measurements in the sense first comparison star, program star, second comparison star were made in each colour. From the magnitude differences between HR 4861 and HR 4855 we infer that the mean error on one measurement amounts to $0^m.005$ magnitudes in all colours.

The measurements were made during a time span of almost 6 hours, which, according to the period of Bartolini et al. covers five periods. Using the method of least squares we approximated the magnitude differences 27 Vir - HR 4861 by a trigonometric polynomial with unknown frequencies and coefficients. The mean value of the location of the well-defined maxima in the frequency spectrum in every colour yielded a period $P = 0^d.042 \pm 0^d.0015$ with regression coefficients lying between 0.7 and 0.9. Figure 1 shows the resulting phase-diagrams for $P = 0^d.042$.

During the following night (Feb. 27/28) 11 measurements in the

B₂ filter were obtained during a time span of 1^h30^m. The mean error on one measurement as derived from the differences between the comparison stars is 0.^m004. The resulting light curve is shown in Figure 2.

It is evident that a period of 0.^d042 cannot fit the observations. A least squares fit yields an optimal representation by a sine curve for P=0.^d056. The fitted curve with amplitude (half-range) of 0.^m013 is shown in Figure 2.

These two discrete P-values, and also the shape of the light-curves obtained by Bartolini et al. indicate that this Delta Scuti star too exhibits multiple periodic light variations. Continuous monitoring is needed in order to extract two or more periods from the measurements.

Acknowledgement

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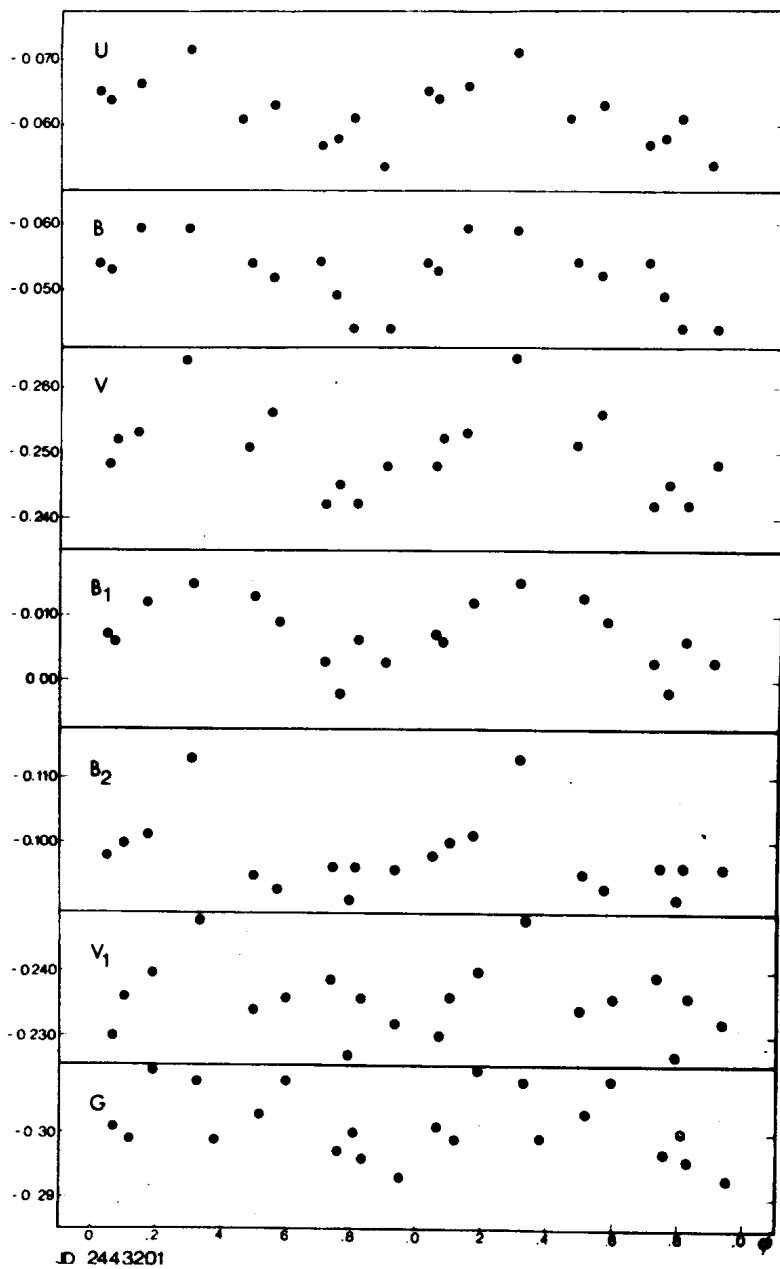
C. STERKEN
Astrophysical Institute
Vrije Universiteit Brussel
Pleinlaan 2
B-1050 Brussels, Belgium

Reference:

Bartolini, C., Piccioni, A., Silveri, P.: I.B.V.S. No.981, 1975

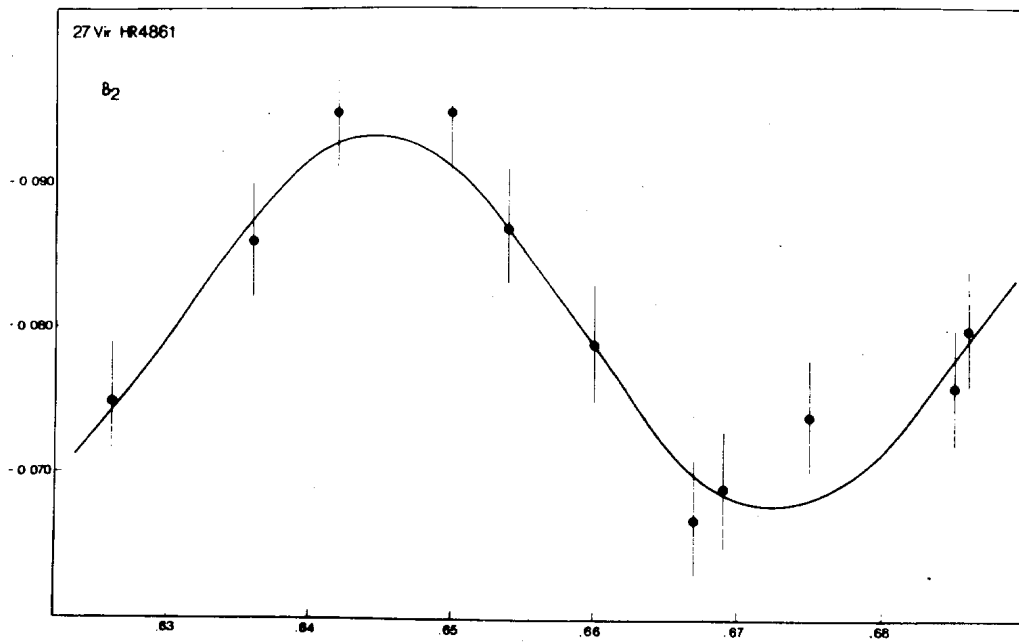
27 Vir - HR 4861

P. 0^d.042



JD 2443201

Fig. 1 : Phase diagrams constructed with $P=0^d.042$ for the differential measurements 27 Vir - HR 4861 on JD 2443201.



D 2443202

Fig. 2: B_2 measurements on JD 2443202 and the fitted sine-curve.