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BD+0^o3566, A NEW SHORT PERIOD VARIABLE STAR

A new variable star was found during a photometric study of the W UMa type star V502 Oph.

The comparison stars were chosen according to the standard criteria: they must be of approximately the same magnitude and less than two degrees from the program star. The characteristics of the observed stars are shown in Table I.

The observations were made with the 0.84m reflector at the Observatorio Astronomico Nacional, San Pedro Martir, Mexico during the nights of 13/14 and 14/15 June 1987. A Lowell photon counting system was utilized with Johnson's V filter.

Each observation is the result of one 40 s integration on each star. The sequence C1, C2, V was followed except at the time of the eclipse of V502 Oph when a continuous monitoring of the eclipsing star was undertaken. This explains the gaps in the photometry of this new variable star. The photometric values reported in Table II and shown schematically in Figure 1 are the magnitude differences between BD+0^o3566 (C2) and BD+0^o3569 (C1). On each night the average of the points has been subtracted to establish the zero baseline. The data points are accurate to 0.^m005 the average time span between successive points is 0.^d01 and the accuracy in time is 0.^d0014. From Figure 1 it can be seen that the amplitude of the variation is 0.^m04, although it is changing from one day to another. If the star is pulsating, this suggests the existence of several simultaneously interacting modes. The Fourier transform of the two nights confirms this result.

Table I

Characteristics of the observed stars

	BD	V	Sp.	α (1950)	δ	Type
V502 Oph	SAO +0 ^o 3562 121784	8.4-8.98	G2V+F9V	16 ^h 38 ^m 48 ^s	+0 ^o 36'8".5	WUMa
C1	+0 ^o 3569 121805	8.5	G0	16 40 19	+0 10 6.9	Comp.
C2	+0 ^o 3566 121803	8.45	A3	16 40 07	+0 37 11.3	New

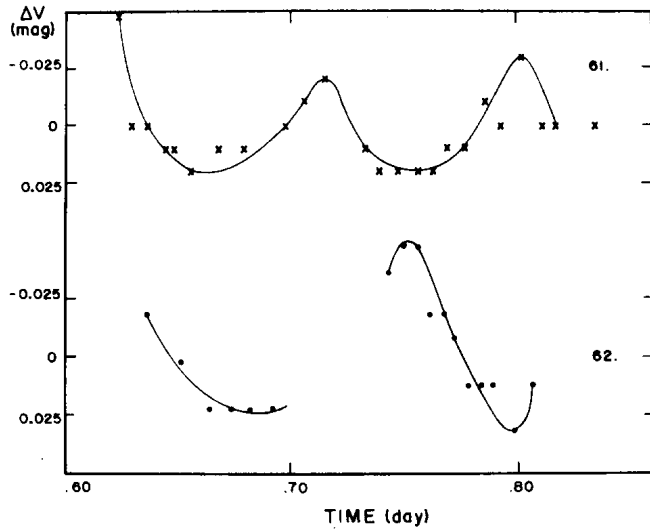


Figure 1. Light curve of the new variable star
BD +0°3566. On top, night HJD 2446961; bottom,
night HJD 2446962.

Table II
Photoelectric photometry of BD +0°3566

HJD	ΔV	HJD	ΔV
2446960+		2446960+	
1.6221	-0.049	1.8103	0.000
1.6304	0.000	1.8179	0.000
1.6373	0.000	1.8262	-0.040
1.6450	0.010	1.8346	0.000
1.6485	0.010	2.6367	-0.018
1.6561	0.020	2.6512	0.002
1.6686	0.010	2.6644	0.022
1.6797	0.010	2.6728	0.022
1.6894	0.010	2.6818	0.022
1.6978	0.000	2.6915	0.022
1.7061	-0.010	2.7436	-0.038
1.7151	-0.020	2.7492	-0.048
1.7318	0.010	2.7554	-0.048
1.7387	0.020	2.7610	-0.018
1.7471	0.020	2.7665	-0.018
1.7554	0.020	2.7714	-0.008
1.7623	0.020	2.7776	0.012
1.7693	0.010	2.7832	0.022
1.7762	0.010	2.7887	0.022
1.7853	-0.010	2.7978	0.032
1.7929	0.000	2.8054	0.022
1.8012	-0.030		

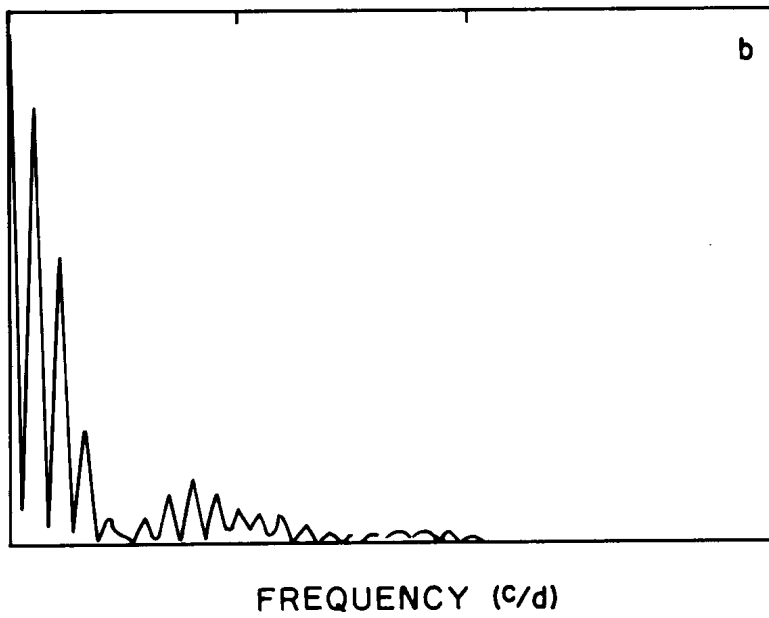
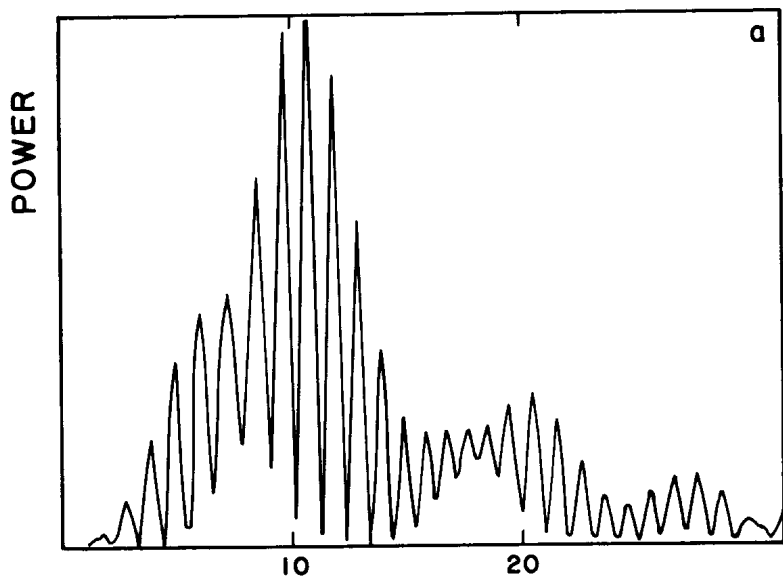


Figure 2a. Power spectrum of the two nights.

Figure 2b. Window function.

Figure 2b represents the window function, whereas Figure 2a the power spectrum of the two nights, with peaks at 9.70 and 18.45 c/d or, corresponding, periods at 0.103^d and 0.05^d . Since the spectral class of the newly found variable has been reported in the SAO Catalogue as A3, one might speculate from the observational characteristics, that it might be a pulsating star of Delta Scuti type, especially since it shows a relatively small and changing amplitude, two close and short periods of pulsation and a spectral type of A3. More detailed observations are needed to univocally decide on its nature.

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