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DETECTION OF PERIODIC LIGHT VARIATIONS OF THE OLD NOVA BD Pav\*

BD Pav was discovered by Boyd (1939) when it had risen during 4 days from invisibility ( $m_p > 16^m.4$ ) to a maximum brightness of  $12^m.4$  on Sept. 7, 1934. In the following 6 days the star declined to  $12^m.85$  and finally became fainter than  $15^m.5$ , 20 days after maximum. Boyd classified BD Pav as a nova.

During two observing periods at the European Southern Observatory at La Silla, extended high speed photometry and spectroscopy of BD Pav have been performed, the observational details are given in Table I.

Table I

Date	HJD - 2444000		Telescope	Filter	Int.time
	Start	End			
1980-06-13/14	404.87	404.88	1.5m ESO	Spectrum	15m
1980-06-21/22	412.643	412.820	1m ESO	R(RG 665)	3s
1980-06-21/22	412.643	412.820	1.5m Danish	white	2.9s
1981-07-01/02	787.535	787.866	1m ESO	B,R	4s
1981-07-02/03	788.560	788.910	1m ESO	white	2s
1981-07-06/07	792.583	792.909	1m ESO	V,I	1s*
1981-07-07/08	793.585	793.917	1m ESO	U,V	2s

\*Simultaneously spectroscopic observations at the 1.5m ESO telescope. Exposure time: 15-20 min.

A strictly periodic light-variation with an amplitude up to  $0^m.5$  could be detected. The mean light curve is characterized

\*Based on observations collected at the European Southern Observatory.

by two humps of different shape and amplitude. A period analysis was applied to the data spanning a time interval of about 1 year. The only two humps observed in 1980 were somewhat distorted due to changing atmospheric transparency. If the identification of the higher hump in the 1980 lightcurve is taken to be correct the error of the photometric period is  $5 \cdot 10^{-7}$ . The time for the deeper light minimum after the brighter hump is given by the following ephemeris:

$$\text{HJD(lower minimum)} = 2444412.676 + .1793015 \cdot E$$

$\pm 1$ 
 $\pm 5$

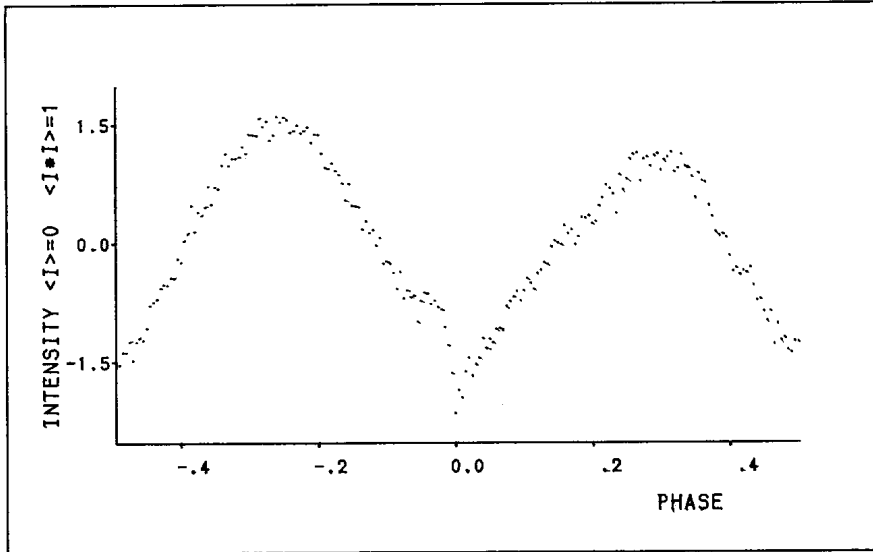


Figure 1: Variation of intensity of BD Pav according to the given ephemeris.

A phase diagram combining all data (for the nights with two color photometry we took the bluer range) is shown in Fig. 1. Before averaging into 200 bins the data of each night were normalized to obtain an average intensity of zero and equal hump amplitude.

There is a small humplike feature preceding the deeper minimum. The minimum itself frequently is very steep. Flickering, a characteristic property of cataclysmic variables, is found with timescales of minutes in the individual light curves. The spectrum is characterized by broad Balmer emission lines with complex structures, superimposed on broad shallow absorptions. Strong V/R variations with the photometric phase are shown. The intensity of the double peaked emission lines of H and HeII decreased strongly between June 1980 and July 1981.

A detailed analysis of the photometry and spectroscopy of BD Pav will be published elsewhere.

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