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UBV PHOTOMETRY OF II Peg DURING OCTOBER 1988

II Peg (BD + 27°4642, HD 224 085) is a single-lined active binary non-eclipsing system consisting of a K2-3 IV-Ve primary and a spectroscopically unseen secondary. The activity of II Peg is exhibited in all accessible regions of the electromagnetic spectrum (X-ray, ultraviolet, radio, optical). Its quasi-periodic light curve with a period nearly equal to the orbital period ($6^{d}.72422$) is variable both in amplitude and mean light level. It is generally attributed to the rotational modulation of starspots (Rucinski, 1977; Vogt, 1981; Poe and Eaton, 1985) and therefore II Peg is classified as RS CVn's. The various shape of the light curve of II Peg during different seasons could be explained by the changes in the temperature, location and the area of the spots, i.e. with the existence of a spot activity cycle. It is necessary to obtain enough light curves throughout a period of several years to define the migration curve.

The UBV photometry of II Peg obtained during October 1988 is presented in this paper. The observations were carried out with the 60-cm Cassegrain telescope equipped with a two-channel photometer (Szymanski and Udalski, 1988) at Mt. Suhora Observatory of Krakow Pedagogical University. In order to satisfy the requirements of the two-channel photometer (the distance between a variable and a comparison star to be between 10 and 20 arcsec) we have chosen BD + 27°4646 as the comparison star.

The observations were corrected for the atmospheric extinction using the mean extinction coefficients for the observatory. Due to the difference of about $0^{m}.65$ between the colours of the variable and the comparison star, second order extinction corrections were made.

The observational data reduced to Johnson-Morgan system (in the sense comparison minus variable) are listed in Table I. The mean errors are about $0^{m}.01$, $0^{m}.01$ and $0^{m}.02$ in V, B and U filters, respectively. The points marked with symbols ':' and '*' are those of lower quality.

The data are plotted in Figure 1. They cover well three consecutive cycles. One can see the same behaviour of the light curves in the three

Table I

No.	JD 2440000.+	ΔV	ΔB	ΔU	Notes
1	7437.613	1.915	1.253	0.585	
2	7438.400	2.076	1.420	0.709	
3	7439.367	2.129	1.480	0.799	
4	7440.328	2.049	1.407	0.708	
5	7441.426	1.925	1.273	0.602	
6	7443.641	1.778	1.097	0.328	:*
7	7444.346	1.918	1.246	0.580	
8	7446.393	2.136	1.477	0.852	
9	7447.355	2.061	1.388	0.749	:
10	7448.452	1.909	1.240	0.594	:
11	7449.350	1.759	1.067	0.388	
12	7450.336	1.746	1.026	0.345	
13	7451.279	1.964	1.314	0.662	
14	7452.275	2.114	1.464	0.785	
15	7453.327	2.089	1.454	0.775	
16	7453.635	2.094	1.460	0.713	*
17	7454.293	1.998	1.356	0.664	
18	7454.625	1.959	1.363	0.654	*
19	7455.270	1.847	1.182	0.504	
20	7456.255	1.765	1.080	0.362	
21	7456.632	1.721	1.062	0.351	*
22	7457.478	1.831	1.156	0.465	
23	7458.380	2.024	1.412	0.726	:

symbols: ':' bad atmospheric conditions
'*' large zenith distance

filters: one maximum and one minimum per cycle. There are also similar asymmetric shapes in the three cycles. The amplitudes of the light variations in the U, B and V filters are $0^m.52$, $0^m.45$ and $0^m.41$ respectively. These amplitudes are quite large in comparison with those observed in 1985/86 (Wacker and Guinan, 1986) but they are in good agreement with Byrne's (1986) observations made in September 1986 and with those of Boyd et al. (1987) obtained in October 1986 - February 1987.

Our observations allow us to determine a new photometric period value for II Peg : $6^d.75$. It is longer than the periods known from the literature: $6^d.7026$ (GCVS) or $6^d.72422$ (Vogt, 1981). We suggest the increase of the brightness period to be due to the slower rotation of the star at the higher latitudes where the spot (or spots) is (are) situated during this season.

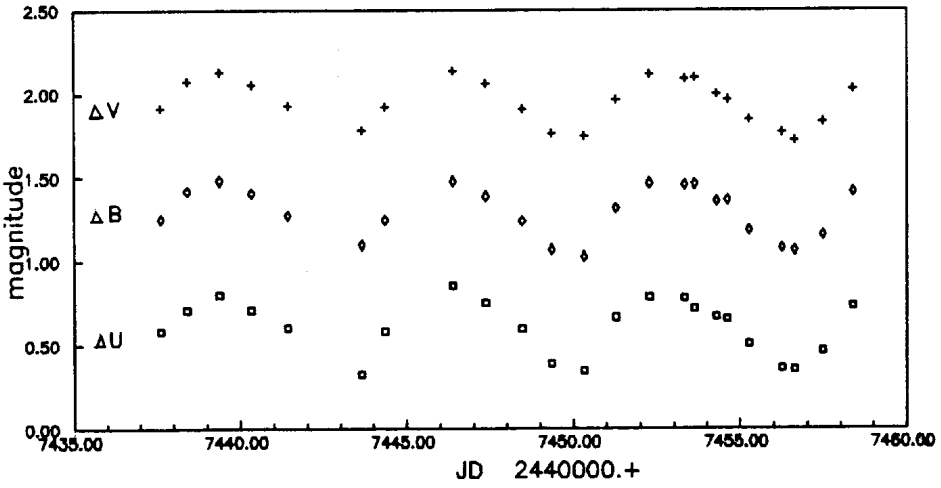

Figure 1

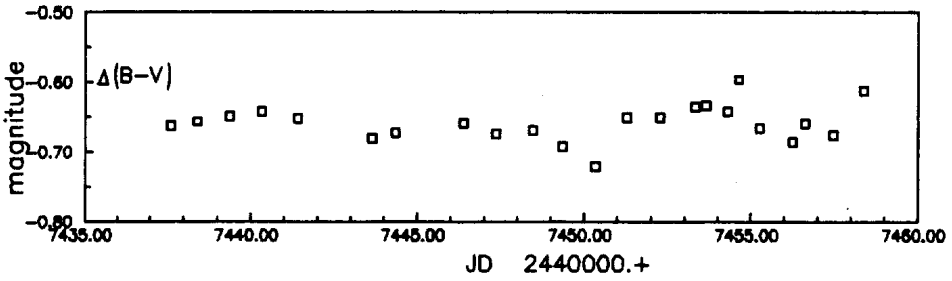

Figure 2

The respective B-V colour variations are presented in Figure 2. Some points (noted with symbols in Table I) do not lie well on the smooth curve determined by the other points. Nevertheless, it is seen that some regular variability exists and it is in phase with the variations in the V, B, and U filters. The amplitude of the B-V variations is about $0^m.05 - 0^m.06$ (if the deviating points are excluded).

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GABRIEL PAJDOSZ[1] DIANA KJURKCHIEVA[2] STANISLAW ZOLA[3,1]

1 Astronomical Observatory of Pedagogical University, Krakow, Poland
2 Higher Pedagogical Institute, Shoumen, Bulgaria
3 Astronomical Observatory of Jagiellonian University, Krakow, Poland

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