PHOTOMETRY OF THE RS CVn BINARY II PEG

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B and V photometry of II Peg obtained at Kavalur on 39 nights during 1980-81, 1981-82 and 1984-85 observing seasons is presented in Fig. 1. From an analysis of the available data on this object we find that no two light curves agree in any of the following : shape, amplitude, phases of the light maxima and minima, mean light level, or brightness at the light maxima and minima.

In Fig. 2 we have plotted the phase of light minimum against the mean Julian Day of observation. The values are visual estimates from the respective light curves. Photometric data on II Peg are taken from Chugainov (1976), Rucinski (1977), Vogt (1981), Nations and Ramsey (1981), Raveendran, Mohin, and Mekkaden (1981), Bohusz and Udalski (1981), and Rodono, Pazzani, and Cutispoto (1982).

It is interesting to see that during the interval from JD 2444175 to JD 2444595, the light curves had two minima indicating the simultaneous presence of two major active regions, say A and B, separated in longitude. The solid lines represent the 'best fit lines' passing through well defined minima. The slightly different slopes indicate different photometric periods of 6.672 ± 0.010 and 6.694 ± 0.002 days for these two regions A and B respectively. This implies that the respective regions were located at different latitudes also. The minima observed at JD 2444878 and JD 2444988 were also included in group B for the solution of the photometric period, since both lie close to the line passing through the minima of group B.

Further, we find that both the minima observed by Rucinski in 1976 and Vogt in 1977 lie on the line corresponding to group B. Probably the active region had its origin sometime in 1976 and finally disintegrated sometime in 1981. This puts a limit of about 5-6 years for the life time of the active region. The minima belonging to group A which appeared in 1979 could not be traced after 1981 and hence probably had a shorter life time. Similar values for the life time for the centres of activity have been found in the case of DM UMa, another active member of the RS CVn class (Mohin et al. 1985).

The minima observed by Chugainov in 1974 follow a completely different path indicating that the corresponding activity had a different latitude and longitude. Again the recent photometry shows that the two

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minima observed do not fall on any of the two lines and hence probably are due to different active regions formed later.

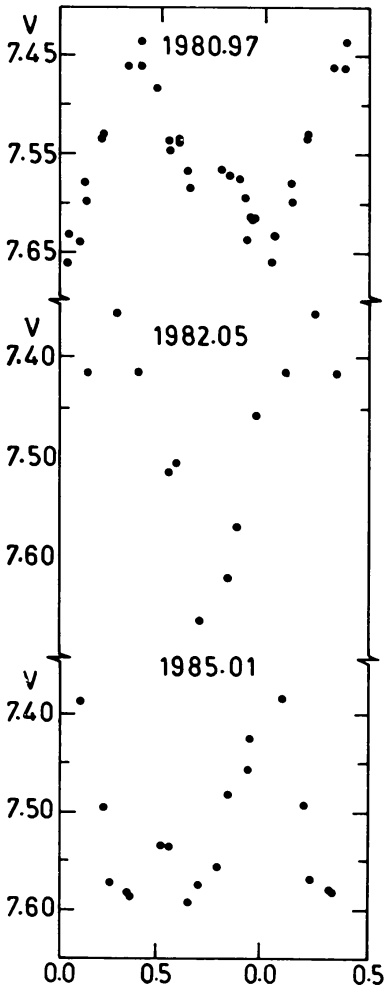

Figure 1

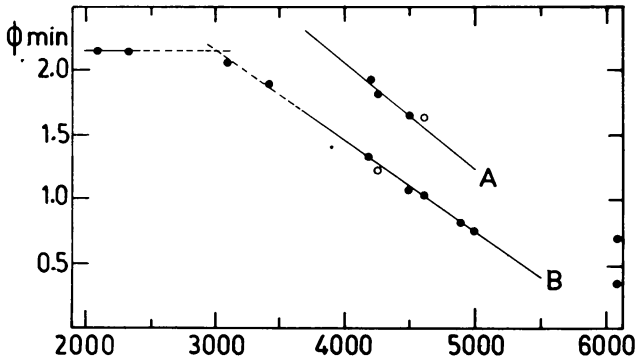

Figure 2

It is also found that there is apparently no correlation between the colour (B-V) and the visual magnitude, but there is a large scatter with a total range of ~ 0.1 mag, much larger than the expected observational error.

An extended version of this paper will be submitted to Bulletin of the Astronomical Society of India.

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