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PROBABLE DETECTION OF A VERY SHORT ORBITAL PERIOD  
FOR THE OLD CLASSICAL NOVA CP PUPPIS (1942).

Spectra of the old nova CP Pup were obtained from May 1 to May 5 1984 with the IDS detector of the ESO 1.5-m telescope of La Silla, Chile. Those of the first 4 nights in the range 4080-5290 Å had a dispersion of 59 Å/mm, while those of the last night in the range 4400-6750 Å had a dispersion of 114 Å/mm. Exposure times range from 20 to 40 min.

After reduction and various corrections the spectra showed signs of rapid changes on time scales of 1/2 hr. Because of this each of the exposures, corresponding to the two IDS apertures, used to construct our IDS image files, were considered separately.

Power spectrum analysis of radial velocities shows many peaks, because observations were grouped in runs of the order of 0.1 days for successive nights. However, as can be seen in Fig. 1, the HeII  $\lambda 4686$  emission line radial velocity peaks have themselves a "peak" between periods of 0.05 and 0.07 days, while H $\beta$  does not so clearly define a best period.

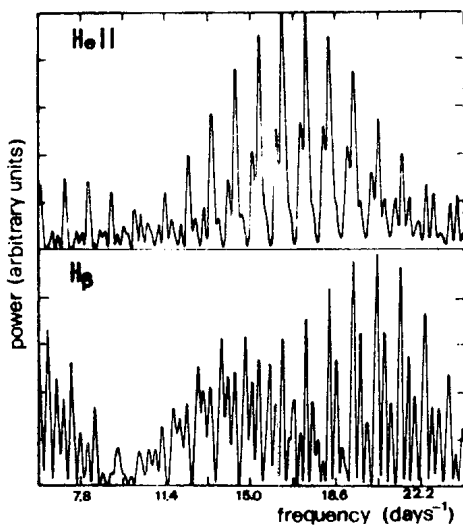


Fig. 1. Power spectra of HeII  $\lambda 4686$  and H $\beta$  radial velocities. HeII solution: in the frequency range 14.3-19.3 days<sup>-1</sup> are given in Table 1. Most of the peaks are separated by distances corresponding to integral multiples of the frequency for one day. Some periods are however more probable than others.

Table I

HeII  $\lambda 4686$  radial velocity solutions between  $P = 0.05$  and  $P = 0.07$  days

P (days)	Comments
0.06977	$H_{\beta}$ radial velocity better than following, but HeII worse
0.06518	$H_{\beta}$ radial velocities very bad
0.06115	quite good; also given by $\chi^2$ method for HeII equivalent widths
0.05765	not so bad
0.05169	worse for both $H_{\beta}$ and HeII radial velocities

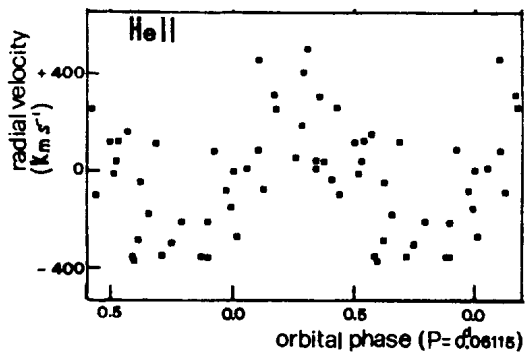


Fig.2. Radial velocity curve of HeII  $\lambda 4686$  (single aperture spectra) emission line. Orbital phases are given for  $P=0.06115$  days,  $T_0=JD2445822.5217$ .

Various arguments including the scatter of the points, and the phase of what appears to be an eclipse of  $H_{\beta}$  suggest a most probable period of 0.06115 days (see Fig. 2). The equivalent widths of HeII  $\lambda 4686$  also appear to have the same period.

This is the first orbital period of an old classical nova which would appear to be below the cataclysmic binary period gap (Robinson, E.L., 1983 IAU Colloquium No.72, Dordrecht:Reidel, 101, 1). New observations are needed to settle the question as to whether the true binary period was detected, rather than the orbital period of a blob in the disc or some kind of pulsation.

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