COMMISSION 27 OF THE I.A.U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3590

Konkoly Observatory
Budapest
17 April 1991
HU ISSN 0374 - 0676

THE PULSATION AMPLITUDE OF DELTA CETI

δ Ceti (HR 779, HD 16482) is a classical, no-frills, singly-periodic β Cephei variable. Its one claim to fame rests on the well-observed secular changes in its period and velocity amplitude. These have been documented and discussed in detail by a number of authors (Lloyd & Pike, 1984; Jerzykiewicz et al., 1988). Lloyd & Pike emphasized the requirement for consistent monitoring of this object with the hope that a substantial database of observations, built up over many years, would aid in the understanding of this, one of the purest β Cephei variables.

In this spirit, Kubiak and Seggewiss (1990) have recently reported an analysis of observations from the 1986 observing window. From their spectroscopic data they present the striking result that the observed pulsation velocity amplitude was nearly twice that previously observed and well in excess of that expected from the ephemeris calculated by Lloyd & Pike. The purpose of this note is to present the results of some spectroscopic observations taken by the authors rather fortuitously only some three months before the Kubiak & Seggewiss data and to reiterate, before the next observing season, the need for further observations of this star. Full details of our spectral observations together with some further photometry will be published elsewhere. The spectra reported on here were obtained very early in the 1986 season and as a result do not cover a full pulsation cycle. However, given the accuracy with which the period is known, the amplitude can be estimated accurately enough from the available phase coverage.

Our spectra were obtained at the Cassegrain focus of the Isaac Newton Telescope at the Spanish observatory of El Roque de los Muchachos, La Palma using a GEC CCD as detector and a grating giving a reciprocal dispersion of 7.6 A/mm. The spectra were centred at 4580A so that each exposure included nine sharp lines of Si III, O II and N II. The velocities derived are given in Table I. The observed values have been corrected for the Earth's motion but not for any instrumental zero point. The average standard error of the mean velocity of each spectrum is 0.8 km/s. The results are plotted in Figure 1 where they have been overlayed with a fitted least-squares sinusoid of period 0.161137 days. The derived semi-amplitude

Table I

Radial Velocities of HR 779

HJD+ 2446639	km/s	HJD+ 2446639	km/s
.64604	14.8	.70126	2.5
.64971	13.7	.70423	2.5
.65337	12.8	.70718	2.8
.65726	11.7	.71015	3.3
.66381	9.4	.71315	3.4
.66815	7.5	.71894	4.2
.67110	7.3	.72194	5.4
.67408	6.0	.72493	5.9
.67708	4.8	.72790	6.2
.68004	4.6	.73090	6.5
.68633	3.6	.73715	8.7
.68930	3.3	.74013	10.0
.69226	2.5	.74309	10.2
.69523	2.3	.74619	11.9
		.74918	12.8

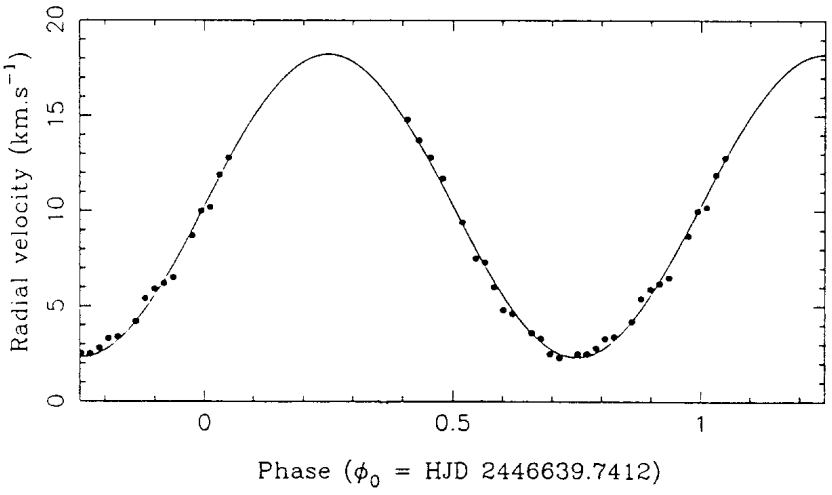

Figure 1

is K = 7.95 +/- 0.10 km/s. This compares favourably with the value of K = 8.1 km/s predicted by the amplitude ephemeris of Lloyd & Pike (1984). The time of velocity maximum is HJD 2446639.7815 +/- .0002 which has an (O-C) of +0.02 days from the Lloyd & Pike ephemeris and +0.01 days from the more recent ephemeris of Kubiak & Seggewiss. We also note that our new photometry is also consistent with previous photometry and ephemerides.

If the result of Kubiak & Seggewiss represents a real amplitude increase

it must have been rather sudden. Its duration is unknown but the solution to that may lie in some, as yet, unreduced data since we note that the average time between acquisition and publication of new data on this star is about 5 years! In any case it provides, yet again, an illustration of the value of systematic monitoring and lest we forget..... another 5 years has passed!

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