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NEW PHOTOMETRIC OBSERVATIONS OF THE β CMa STARS γ Peg , 12 Lac AND β Cep

Recents studies demonstrated the existence of secular changes in periods and amplitudes in most of β CMa stars (Chapellier, 1985, 1986). In these papers the importance of regular observations of these stars were underlined.

Three of the classical β CMa stars, i.e. γ Peg , 12 Lac and β Cep were observed in October 1985, at Pico del Veleta, (Spain), with the 60 cm telescope of the Nice Observatory. The Geneva type photometer described in Le Contel et al. (1974) was changed from analogical to photon counting system. The photomultiplier was a 9816Q EMI tube with a S20 photocathode. Its temperature was regulated at -13° C ± 0.1. Filters 4 and 5 (respectively UV and blue) described in Sareyan et al. (1976) were used. For the brightest stars, γ Peg and β Cep , a neutral filter (d = 1.2) was used. One comparison and a check star were observed in sequence with the variable. In Table I we listed for each variable the comparison star, the heliocentric dates of observed maxima on the different nights and the corresponding amplitudes in the two filters. When we were unable to give a precise determination of a light maximum we only give in column 3 the Julian day.

γ Pegasi

The observed maxima are in agreement with the two latest ephemerides published by Sareyan et al. (1975) and Koubsky et al. (1981). As the phase lag between radial velocity maxima and light maxima is different from one study to another, (0.25 P in Sareyan et al., 0.18 in Koubsky et al.), we reanalysed separately all the published photoelectric and spectrographic data and derived the following ephemeris :

$$M_{V_\odot} = 2426000.1106_{\pm 26} + 0^d.15175022_{\pm 3}\ E$$

Table I : Light maxima dates and amplitudes

Star	Filter	M_{ℓ_0} (2400000+)	Amplitudes (mag)	Comparison star
γ Peg	blue	46351	0.025	HR 26
-	uv	46351.367	0.04	-
-	uv	46351.529	-	-
-	b	46354.39:	0.02	-
-	b	46354.560	-	-
-	uv	46354.409	0.03	-
-	uv	46354.560	-	-
12 Lac	b	46348	0.02	HR 8603
-	uv	46348	0.03	-
-	b	46353.420	0.09	-
-	uv	46353.424	0.14	-
β Cep	b	46349.51:	0.045	HR 8227
-	uv	46349.501	0.055	-
-	b	46352.38:	0.03	-
-	uv	46352.379	0.04	-

The corresponding mean phase lag is 0.24 ± 0.03 P.

In conclusion the period and amplitudes of γ Peg appear to have remained constant over the last fifty years.

12 Lacertae

This multiperiodic variable was observed at two different phases of the beat period. The amplitude seems to be constant. Only one maximum could be determined on the night when the amplitude of the beat period is larger. Its date is in good agreement with the ephemeris determined by Chapellier (1985) assuming a constant primary period since 1939. On the contrary it departs (Δ T = 0.0230 d) from the ephemeris which assumes that the primary period is decreasing at a rate of 0.21 s/c.

β Cephei

The amplitude in both filters is almost twice that of our last observations performed in 1983 (Chapellier, 1983). The cyclic variation of this parameter pointed out by Chapellier (1986) is confirmed. The period remains constant.

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