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53 Psc REVISITED

53 Psc (B2.5 IV, HR 155, HD 3379) is a variable star located on the red side of the β CMA star instability strip. Williams (1954), Mathews (1956) and Sareyan et al. (1979) observed short period variations in light and radial velocity. Large profile variations were also claimed by Mathews (1956) and Sareyan et al. (1979). The quoted periods range from 0.08 to 0.091 day and the amplitudes are small: 0.01 mag in the UV domain, 0.002 to 0.01 in the blue region, a few km/s to 25 km/s in radial velocity over a night. Percy (1971) and Jerzykiewicz (1973, in Sareyan et al. 1979) found it to be constant in the B and the y filter respectively.

Recently, Wolf (1987) published a V light curve with an amplitude of 0.035 mag and a period of 0.096 d.

We report here on series of observations that we performed on 53 Psc in 1982 and 1987 with the 62 cm telescope of the Nice observatory at Pico del Veleta (Spain).

Two comparison stars, viz. 34 Psc (HR 26) and 66 Psc (HR 254), were used. The observations were made through our UV filter "4" and blue filter "5" (Sareyan et al., 1976) in 1982. In 1987 we used Strömngren u and b filters. Two nights of observation were obtained in October 1982, while in 1987, 2 and 4 nights were obtained in September and November respectively. The observational runs lasted more than 4 hours. The air masses were less than 2 during each observing sequence. Although the quality of the different nights were not of first class, a variation with a total amplitude over 0.01 mag would have been detected. This was not the case on any given night.

In view of these results the behaviour of 53 Psc appears rather peculiar: observed at different scattered moments this star exhibits variations with amplitudes varying from 0.002 to 0.035 mag in visible light and from few to 25 km/s in radial velocity.

Because a considerable amplitude in light variations is only observed on a single night from among more than fifteen, it is statistically not probable

that the observed amplitude changes are related to a beat period between interfering modes.

Although its period is very short, the pulsational constant of 53 Psc derived from Shobbrook's (1985) new photometric calibration is equal to 0.017 which is a value similar to the pulsational constants of the β CMA variables in NGC 6231 (Shobbrook, 1985).

The observed amplitude variations could be related to the location of 53 Psc at the low temperature border of the β CMA instability strip where the mechanism responsible for the instability is perhaps not enough efficient to maintain a stable pulsation. It would be interesting to look for such a phenomenon in *iota* Her, another star of this region of the HR diagram in which short period variations have also been detected (Chapellier et al., 1987).

Another possibility is that 53 Psc presents long term changes in amplitudes similar to those pointed out in different β CMA stars (Chapellier, 1986).

More simultaneous photometric and spectrographic observations are needed in order to obtain a better understanding of the behaviour of 53 Psc which could lead to new ideas on the mechanism responsible for this type of variability.

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