

## Semiregular Variables: The Character of Variability and Possible Subdivision of the SRc Class

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**Abstract.** It is proposed to split the SRc class into two subclasses with prototype stars PZ Cas and S Per.

We use a set of photometric parameters (amplitude, mean amplitude, temporal variability of frequency and amplitude) for the detailed classification of SR variables. For the periodogram analysis, we have used the computer codes by Andronov (1994).

We studied brightness variations of PZ Cas during 14 yr (Andronov, Kudashkina, & Romanenko 1992). The period of this star increased from 801 to 900 d. After this, from 1994 the star had nearly constant brightness, and until 1997 showed small occasional increases of the brightness. An inversion of the asymmetry of PZ Cas with a 18-yr cycle was suggested by using earlier photographic observations (1957–1983) by Kudashkina (1985).

S Per is a SRc-type star with a strong modulation of the amplitude of pulsations. The peak in the periodogram is double:  $P_1 = 809^{\text{d}}6 \pm 0^{\text{d}}2$  and  $P_2 = 768^{\text{d}}8 \pm 0^{\text{d}}3$ . Besides that, there is a peak in the periodogram corresponding to the cycle of  $16170^{\text{d}} \pm 160^{\text{d}}$ . The light curve of S Per has been regular since JD 2447000 with the period  $816^{\text{d}}8$ . Suggesting that the star pulsates in the fundamental mode and using the classical relationships for blackbody and  $P-L$  relationship for supergiants (Feast 1980), we have estimated the radius of S Per to be approximately  $1400 R_{\odot}$ .

The conclusions are: The type SRc can be divided into at least two subtypes: (1) SRca – supergiant stars with multiperiodic pulsations and regular light curves of the Mira-type, sometimes disturbed by the switching mode intervals (S Per); and (2) SRcb – supergiant stars with quasi-periodic light curves and intervals of brightness constancy (PZ Cas).

### References

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