

Asteroseismology of Procyon: Preliminary results from SARG

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The F5 IV-V subgiant Procyon was observed over 6 nights with SARG at TNG. We took sequences of 10 s exposures with an average dead time in between of 127 s. In total, 956 spectra were collected with a typical signal-to-noise ratio ranging between 250-330. Data reduction was performed using IRAF tasks devoted to echelle spectra. Successively the modelling of the star plus iodine absorption spectra was performed by using AUSTRAL code (Endl et al. 2000, *A&A*, 362, 585) in order to obtain the radial velocities time series. The Scargle and Lomb modified periodogram (Lomb 1976, *Ap&SS*, 39, 447, Scargle 1982, *ApJ*, 263, 835) shows two prominent frequencies: $\nu_1 = 0.2346$ mHz and $\nu_2 = 0.8387$ mHz both with a significance level greater than 99%. Frequency ν_2 corresponds to the 20 min period found by Brown et al. (1991 *ApJ*, 368, 599).

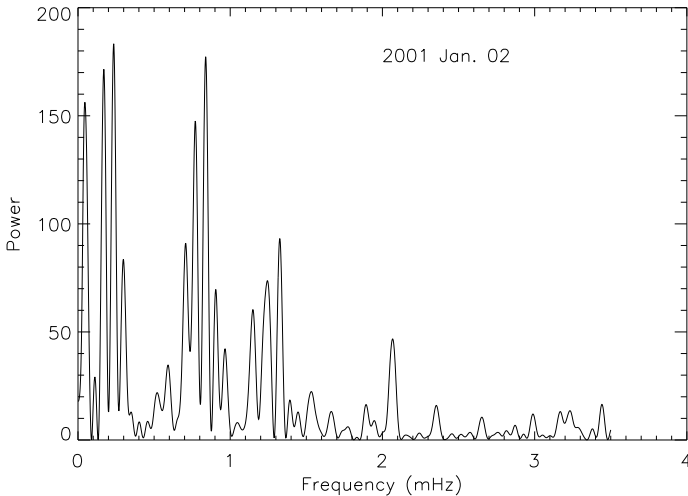


Figure 1: Power spectrum of Procyon SARG time series

In particular we were able to fit data with a sinusoidal signal with a period corresponding to ν_1 . It seems very probable that the Doppler signals detected result from **p-mode** oscillations of Procyon. In fact in our power spectra it is possible to see an excess of power about frequency ν_2 that survive also after a filtering of ν_1 . Moreover the power spectrum seems to have a cut-off for frequencies greater than 1.6 mHz almost equal to the acoustic cut-off frequency predictions for Procyon. In order to confirm these preliminary results we have to perform the reduction of the remaining 5 observing nights, but now we are confident that SARG is one of the promising instruments for the challenging task of the solar like **p-mode** detection.

References

- Brown et al., 1991, ApJ, 368, 599
Endl et al., 2000, A&A, 362, 585
Lomb, 1976, Ap&SS, 39, 447
Scargle, 1982, ApJ, 263, 835