

Frequencies and oscillation modes of variable stars in σ Orionis and NGC 6811

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Abstract

We study photometric variable stars in two open clusters of very different age: σ Orionis ($\tau \sim 3$ Ma, $d \sim 385$ pc) and NGC 6811 ($\tau \sim 600$ Ma, $d \sim 1000$ pc). In NGC 6811 we expected to detect pulsations in known δ Scuti stars that are also observed in the *Kepler* field, from which we calculate the frequency spectra, and derive information about the stellar interior using asteroseismological models. In σ Orionis we expected to detect variability in stars produced by cool and hot spots on their surfaces because of magnetic activity, as well as by flares and occulting circumstellar discs. We confirmed our expectations and we also had a nice surprise, the discovery of a δ Scuti candidate in σ Orionis. It is Mayrit 524060 (HD 37564), a bright young A0 V star with a period $P = 1.61$ h and an amplitude of 0.017 mag.