
Identifying modes in KIC 5807616, a pulsating sdB star from Kepler field

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Abstract

KIC 5807616 is a pulsating B-type hot subdwarf, reported to harbor planets. Its Kepler spacecraft Q2 and Q5-Q8 light curves as well as spectroscopic data were already analyzed and parameters characterizing the star were derived. Since then, Kepler had collected 2 years of additional data (Q9-Q16 and half of Q17). One might think new data could improve previously derived parameters, but it doesn't seem to be that easy. It appears that Fourier transform amplitude spectra (FT) of the KIC 5807616 data do not show "clear" multiplets. Therefore, mode identification is based mainly on period spacing of g-modes, while the analysis of multiplet splitting relies only on two p-modes with stable (clear) multiplet components. In this work, we attempted to get more information about multiplet structure by using a "multiplet stacking" or high resolution "running" FT to identify the modes, estimate the splitting and derive the rotational period of the star. We also analyzed the low frequency region of the FT where signatures of two planets were found in the past, but we have difficulties confirming their existence.

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