

EVOLUTION OF CRITICAL MAGNETIC CYCLE PARAMETERS WITH STELLAR AGE: DIFFERENTIAL ROTATION AND ACTIVE REGION DECAY RATES IN KEPLER CLUSTERS NGC 6811 (1 GYR) AND 6819 (2.5 GYR)

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We propose to observe two candidate g-mode subdwarf B (sdB) pulsators in the old open cluster NGC 6791. Using period spacings and multiplets, we will identify pulsation modes. Their memberships within the cluster will also give us their age, metallicity, distance, and constrain their progenitor mass. These properties will directly test the latest generation of structural models. One g-mode sdB pulsator has already been discovered within this cluster by Kepler, so we can expect to find several more, which can be used to compare and contrast with each other to discern additional internal properties, such as stratification caused by diffusion. As sdB stars represent the exposed cores of most horizontal branch stars, recently verified by means of Kepler observations have linked them to cores of clump red giants via period spacings, what we learn about sdB stars translates directly to the cores of most horizontal branch stars. Only Kepler data can provide the extended, uninterrupted time-series data required to detect and fully resolve the pulsation spectrum. These stars are faint at $K_p=16.2$ and 18.1 , Kepler SC data will yield detection limits near 0.06 and 0.12 ppt with a year of photometry which should reveal rich pulsation spectra with tens of periodicities each. These stars have received SC Q11 DDT time which will be used to verify they are pulsators and that the pixel masks used are optimal.