

CHARACTERIZING THE TOP OF THE RED GIANT BRANCH USING KEPLER DROP-LIST STARS

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We propose to conduct a study of the internal properties of fifty-five stars located near the top of the red giant branch. All of these stars are currently on the Kepler drop list. Program stars have effective temperatures and surface gravities of less than 3600K and $\log(g) = 1.0$ respectively. Project goals are 1) to quantify the range of pulsation spectra found in upper red giant branch stars, 2) to use state-of-the art FAMIAS software to determine the values of several key global and interior properties, and 3) to determine the decay rate (if any) of the observed pulsation modes. Parameters to be measured include masses, ages, metal contents, convective overshoot parameters, hydrogen contents, radii, surface rotations, and rotation profile. Many of the pulsation modes in red giants are thought to be unstable. Observational studies support this assertion, however, the measured decay times range from days to weeks, and even longer time frames are allowed. Since little is known about the long term stability of the oscillations in these stars, and the necessity of removing the longer term pulsations from our light curves, a full year of data is requested.