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Characterizing mid-type M dwarfs in the Kepler field with the Discovery Channel Telescope and WIYN

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Title: Characterizing Mid-Type M Dwarfs in the Kepler Field with the Discovery Channel Telescope and WIYN

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Abstract

Planet occurrence rates increase with decreasing stellar mass (later spectral types); therefore, M dwarf systems are our most promising targets in the search for exoplanets. The identification and characterization of stars in the original Kepler field was accomplished using photometry alone, resulting in large uncertainties for late-type stars like M dwarfs. In order to more accurately compute the planet occurrence rate around mid-type M dwarfs, we need to better constrain their stellar radii and masses, properties which strongly correlate with other stellar parameters such as temperature and metallicity. These measurements need to be performed on a statistically significant population of stars including systems with and without planets. Therefore, we have begun to spectroscopically

characterize the properties of the 559 probable mid-type M dwarfs in the Kepler field using red optical spectra obtained with the DeVeny Spectrograph on the Discovery Channel Telescope (DCT) and Hydra on the WIYN telescope in order to constrain the planet occurrence rate for such stars. We will be presenting initial results from our DCT and WIYN observations, including new temperature, radius, and mass estimates which we can use in occurrence rate calculations.

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