Characterizing the Cool KOIs
An Infrared Spectroscopic Survey of Kepler M Dwarf Planet-Candidate Hosts

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H- and K-Band Spectra of Cool KOIs taken with the TripleSpec Spectrograph on the Palomar 200-inch Hale Telescope Ordered in increasing $T_{\text{eff}}$

Science Highlights!

KOI-961 / Kepler 42: A Mid-M dwarf with 3 Short-period Sub-earths

KOI-961 and its 3 Known Planets

KOI-961 / Kepler 42:

KOI-952 / Kepler 32: A Compact System of 5 Planets

Swift et al. (2013)

KOI-256: An M Dwarf / White Dwarf Binary with Gravitational Microlensing

KOI-256 / Kepler 45: A Hot Jupiter Orbiting a Metal-Rich M dwarf (Johnson et al. 2012)

Spectra provided accurate stellar properties for analysis of KOI-952's 5 planets, aka Kepler 32: A Portrait of the Planet System Through the Decades (Swift et al. 2013)

KOI-3497: A False Giant Star

KOI-3497 shows a deep CO (2-1) band head emission of a giant star, but deep Ni I & Ca I lines are consistent with a dwarf! As noted by Rojas-Ayala, an early M dwarf binary like Kepler-437 b (rich in CO) could be an even closer analog for Kepler-437 b which also has the planet candidate? image courtesy of the Rubin-40 Team, including Christian Benitez, David Krotos, and Nick Lewis.

Comparison to Dressing & Charbonneau (2013)

Left: Stellar effective temperature, metallicity and radius determinations for the stars in this sample. We determined stellar effective temperature and metallicity and using the calibrations of Rojas-Ayala et al. (2010, 2012). We then interpolated these values onto new 5-Gyr Dartmouth isochrones calculated by Gregory Feiden (Uppsala University). The new Dartmouth isochrones include stars with effective temperatures less than 3000 K (Muirhead et al. in prep).

Left: Stellar effective temperature, metallicity and radius determinations for the stars in this sample. We determined stellar effective temperature and metallicity and using the calibrations of Rojas-Ayala et al. (2010, 2012). We then interpolated these values onto new 5-Gyr Dartmouth isochrones calculated by Gregory Feiden (Uppsala University). The new Dartmouth isochrones include stars with effective temperatures less than 3000 K (Muirhead et al. in prep).

Right: Comparing Dressing & Charbonneau (2013), who used photometry to determine Cool KOI properties. Our results generally show good agreement, however, there is a slight metallicity dependence to our determinations. Dressing & Charbonneau (2013) assumed a strict prior for their metallicities determinations due to degeneracies with temperature when using photometry.