Stellar Spectra in the TESS Northern CVZ

Kevin K. Hardegree-Ullman\(^1\), Jessie L. Christiansen\(^1\), Michael C. Cushing\(^2\), Courtney D. Dressing\(^3\), Ian J. M. Crossfield\(^4\)

\(^1\)Caltech/IPAC-NExScI, \(^2\)University of Toledo, \(^3\)UC Berkeley, \(^4\)MIT

In the era of *Gaia*, why do we need spectra?

“Spectral types are defined by appearance of spectra of standard stars... NOT assigned by colors, masses, abs. mags.” – E. Mamajek

- *Gaia* distances are invaluable. Combined with photometry, we can learn a lot about stars.
- Adding spectra gives us more precise info about spectral type, \(T_{\text{eff}}\), \(\log g\), and [Fe/H].

NASA-NSF Exoplanet Observational Research allowed us to get spectra of ~1000 high priority stars with Hydra on WIYN.

- Primary targets are probable K and M dwarfs in the TESS Input Catalog.
- To optimize yield, we placed fibers on other stars with TESS Input Catalog temperatures < 5000 K.
- This yielded spectra for targets across the stellar sequence (classified using PyHammer, Kesseli et al. 2017) highlighting the need for spectra for accurate stellar classification and properties.
- The bottom right panel contains two probable M dwarf-White Dwarf binaries (top) and several nearly featureless spectra with M dwarf-like slopes.
- This study, in combination with large spectroscopic surveys like LAMOST and APOGEE will be crucial for statistical planet studies with TESS.
- These spectra and the associated stellar properties will be available soon on ExoFOP-TESS.