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A Near-Infrared Search for Transiting Exoplanets around Brown Dwarfs using the 1.8-m Perkins Telescope

Transiting exoplanets in the habitable zone around brown dwarfs will be some of the most favorable habitable targets for follow-up atmospheric characterization with JWST, owing to large transit depths. However, we currently know of no transiting exoplanets around brown dwarfs, despite recent observing efforts to target later spectral types (e.g., MEarth). We present plans for a multi-year search for transiting exoplanets around brown dwarfs, using the Mimir instrument on the 1.8-m Perkins Telescope in Flagstaff, AZ. Through transit injection/recovery tests with Mimir photometry, and by simulating our survey with known M-dwarf occurrence rates, we predict the discovery of a handful of planets over the course of the 5 year survey. We present our planned observing strategy, and the simulation tool that we are developing to predict our survey's planet yield. We also show some preliminary brown dwarf lightcurves taken in J-band with Mimir to demonstrate our ability to slew between different targets on a single night of observing.