Uniform Retrieval Analysis of Brown Dwarfs

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Spectra of brown dwarfs are key to exploring the chemistry and physics that take place in their atmospheres. Late T dwarf (850 - 500 K) spectra are particularly diagnostic due to their relatively cloud free atmospheres and deep molecular bands. With the use of powerful atmospheric retrieval tools, these properties permit proper allocation of constraints on the molecular/atomic abundances and temperature profiles. These constraints can be used to derive the elemental abundances (metallicity, C/O), chemical disequilibrium, and non-radiative-convective equilibrium temperature perturbations. Building upon previous analyses on T and Y dwarfs (Line et al. 2017; Zalesky et al. 2019), we present a uniform retrieval analysis of 52 T dwarfs via their low-resolution near-infrared spectra. This analysis more than doubles the sample of T dwarfs with retrieved properties. We present updates on current compositional trends and thermal profile constraints amongst the T dwarf population.