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Characterizing the Atmospheres of Low-Gravity M-dwarfs ISABELA HUCKABEE, AISHWARYA IYER, MICHAEL LINE, Arizona State University — The objective of this study is to model the atmospheres of low surface gravity M-dwarfs. Ultimately this will aid in investigating observed trends in the physical properties of these stars unexplained by models thus far. A growing collection of low surface gravity M-dwarfs (Faherty et al.,2016; Patience et al., 2012) have appeared brighter in the infrared than typical M-dwarfs and they hypothesize this may be from a thick or high-altitude cloud layer, or dust absorption. Our code simulates a 1-D M-dwarf stellar atmosphere and determines the effective temperature, surface gravity, and atmospheric bulk chemical properties such as metallicity and carbon-to-oxygen ratios. We incorporate radiative transfer, equations of state, and convection to determine the model star's spectra, thermal structure, and molecular/elemental mixing ratios. We plan to fit low-resolution spectral data for cloudy, low gravity M-dwarfs and address color and brightness trends seen with these special class of stellar objects. The results will help gain a more in-depth understanding of the physical processes in low surface gravity M-dwarfs and therefore better understanding of potentially habitable exoplanets orbiting them.

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