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Experimental study of alkali-metal collisional line broadening for astrophysical applications FRANCOIS SHINDO, JAMES BABB, KATE KIRBY, KOUICHI YOSHINO, Harvard-Smithsonian Observatory — The visible and near infrared spectra of L- and T-type brown dwarfs exhibit prominent resonance lines of alkali-metal atoms [1]. It is expected that such features are present in the spectra of extrasolar giant planets (EGPs) [2,3]. In the cool dwarfs, the most prominent alkali-features are due to the resonance lines of Na at 590 nm and of K at 770 nm, significantly broadened by collisions with $H_2$and He at temperatures around 1000 K. As this broadening is pressure and temperature sensitive, the resonance line profile can be used as a diagnostic of the atmospheric conditions of cool brown dwarfs and EGPs. To improve the data available for modeling, we have set up a spectroscopic experiment to measure absolute absorption coefficients of alkali vapors colliding with H_2 and He at relevant temperatures. Our apparatus allows us to use the "hook" method to determine the atom number density of the alkali element. We will discuss our first spectroscopic measurements on the absorption of potassium vapors mixed with He buffer gas. This work is supported in part by NASA grant NAG5-12751. References: [1] A. Burrows et al. 2002, ApJ, 573, 394 [2] S. Seager and D. D. Sasselov 2000, ApJ, 537, 916 [3] A. Sudarsky et al. 2003, ApJ, 588, 1121

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