PROGRESS IN THE MEASUREMENT ON TEMPERATURE-DEPENDENCE OF H_2-BROADENING OF COLD AND HOT CH_4

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We report preliminary measurements on the temperature dependence of H_2-broadening of CH_4 in the near infrared at temperatures between 100 and 370 K. In support of the Jovian and exoplanet atmospheric remote sensing in the near infrared, we have measured the temperature dependence of H_2-broadened half width and pressure shift coefficients of CH_4, both of which are known to be rotational quantum number dependent. We studied both cold and hot CH_4 in the atmospheric K band (2.2 μm) with the focus on a) weaker lines in the ν_2+ν_3 band at low temperatures for cold giant planets and b) stronger lines in the ν_3+ν_4 band at elevated temperatures for extra-solar planets (e.g., hot-Jupiters). Three custom-built gas absorption cells (two cold and one hot) were used to obtain the spectra of CH_4 and H_2 mixtures at temperatures between 100 and 370 K. We will discuss our on-going spectrum analysis for a few select *J* manifolds and provide comparisons with published values, which are available only at room temperature.