# AIR-BROADENED LINE SHAPES IN THE $2\nu_3$ R BRANCH OF $^{12}CH_4$ BETWEEN 6014 AND 6100 $CM^{-1}$

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Complete and accurate information on line shape parameters of $2\nu_3$ methane transitions for air broadening as a function of temperature is critical not only for the correct interpretation of the observed atmospheric spectra but also for the development of a reliable theoretical model. For this reason, we obtained a series of high-resolution, high S/N spectra of high-purity $^{12}CH_4$ and $^{12}CH_4$ broadened with dry air at temperatures in the 130 to 295 K range using the Bruker IFS 125HR Fourier transform spectrometer at JPL. Two absorption cells were used in the experiment, a White cell with path length of 13 m for room temperature spectra and a 21 m Herriott cell[a] for cold sample spectra. The 15 spectra used in the analysis consisted of 3 low pressure (0.26 to 2.57 Torr) spectra with pure $^{12}CH_4$ and 12 air-broadened spectra with total sample pressures of 79-805 Torr and volume mixing ratios of methane between 0.23 and 1%. A multispectrum least-squares fitting technique[b] was employed to fit all 15 spectra simultaneously. Preliminary results for select R(J) manifolds will be presented.[c]

[a] A. W. Mantz, K. Sung, L. R. Brown, *et al.*, abstract submitted to this Symposium.

[b] D. C. Benner, C. P. Rinsland, V. Malathy Devi, M. A. H. Smith and D. Atkins, *JQSRT* **53** (1995) 705-721.

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