

## LINE MIXING COEFFICIENTS IN THE $\nu_3$ BAND OF $^{12}\text{CH}_4$ AND $^{13}\text{CH}_4$

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Over 40 high-resolution absorption spectra of methane as previously described<sup>ab</sup> were recorded. Included in the spectra recorded at Kitt Peak were room temperature spectra of methane highly enriched in  $^{13}\text{CH}_4$  broadened by air and having a 5 cm path length. All of these spectra were simultaneously fitted<sup>c</sup> in order to obtain spectral line parameters in the  $\nu_3$  spectral region of  $^{12}\text{CH}_4$  and  $^{13}\text{CH}_4$ . In order to obtain reasonable fits, it was necessary to include line mixing<sup>d</sup> within the rotational manifolds. Line mixing was only required between spectral lines of the same species of methane. All of the P branch has been measured and measurement of the R branch is in progress. Mixing coefficients for the two isotopes and the two branches will be compared. It was also possible in a few cases to measure the line mixing coefficients between pairs of spectral lines belonging to the  $\nu_2+\nu_4$  band.

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<sup>a</sup>V. Malathy Devi, D. Chris Benner, M. A. H. Smith, C. P. Rinsland, G. Guelachvili and L. R. Brown, Self- and Air-Broadening and Shift Coefficients of  $\text{CH}_4$  lines in the 3  $\mu\text{m}$  Region, this conference (1998).

<sup>b</sup>V. Malathy Devi, D. Chris Benner, Mary Ann H. Smith, Curtis P. Rinsland, Guy Guelachvili and Linda R. Brown, Temperature Dependence Of Air-Broadening and Shift Coefficients in the  $\nu_3$  Band of  $^{12}\text{CH}_4$ , this conference (1998).

<sup>c</sup>D. C. Benner, C. P. Rinsland, V. Malathy Devi, M. A. H. Smith and D. Atkins, *JQSRT* **53**, 705-721 (1995).

<sup>d</sup>D. C. Benner, A Multispectrum Nonlinear Least Squares Fitting Technique: Inclusion of Line Mixing, this conference (1998).