LINE MIXING EFFECTS IN THE ν_2+ν_3 BAND OF METHANE.

ADRIANA PREDOI-CROSS, ANIL V. UNNIKRISHNAN, HENRY HEUNG, *University of Lethbridge, Department of Physics, 4401 University Drive, Lethbridge, Alberta, TIK3M4, Canada*; LINDA R. BROWN, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91109*; D. CHRIS BENNER and V. MALATHY DEVI, *Department of Physics, The College of William and Mary, Williamsburg, VA 23187-8795*.

This study provides the first experimental measurements of line mixing via the off diagonal relaxation matrix element formalism in air-broadened methane spectra for any vibrational band and the first off diagonal relaxation matrix elements associated with line mixing for pure methane in the ν_2+ν_3 band of $^{12}CH_4$. A speed-dependent Voigt profile with line mixing is used with a multispectrum nonlinear least squares curve fitting technique.[a] The off diagonal relaxation matrix element coefficients of eighteen pairs of ν_2+ν_3 transitions between 4410 and 4629 cm^{-1} have been determined. The measured self-line mixing coefficients vary from 0.0019 to 0.0390 $cm^{-1}atm^{-1}$ at 296 K, and for air line mixing coefficients vary between 0.0005 and 0.0205 $cm^{-1}atm^{-1}$ at 296 K. The spectral data used in the analysis were recorded at a resolution of 0.01-cm^{-1} using the McMath-Pierce Fourier transform spectrometer located at the National Solar Observatory on Kitt Peak, Arizona.

[a]D. Chris Benner et al. *JQSRT* **53**, 705-721, 1995.