MULTISPECTRUM ANALYSIS OF METHANE FROM 4100 TO 4635 CM^{-1}: SELF- AND AIR-BROADENING COEFFICIENTS (WIDTH AND SHIFTS)

A. PREDOI-CROSS, *Department of Physics, The University of Lethbridge, Lethbridge,AB T1K 3M4, Canada*; L. R. BROWN, *Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr., Pasadena, CA 91109-8099*; V. MALATHY DEVI, D. CHRIS BENNER, *Department of Physics, The College of William and Mary, Williamsburg,VA 23187-8795*.

Methane plays an important role in atmospheric chemistry, and knowledge of the column distribution leads to a better quantitative understanding of its biogeochemical cycles. To support atmospheric remote sensing of methane, we have measured the air-broadened widths and air-induced pressure shift coefficients for over 1400 transitions of $^{12}CH_4$ belonging to $\nu_1 + \nu_4$ near 4220 cm^{-1}, $\nu_3 + \nu_4$ near 4320 cm^{-1} and $\nu_2 + \nu_3$ near 4540 cm^{-1}. Self-broadening coefficients have been obtained as well. Intercomparisons of broadening coefficients of the various bands have revealed that the widths vary according to both the lower and upper state quantum numbers.
[a]

[a]The research described in this paper was carried out by the Jet Propulsion Laboratory, California Institute of Technology, Langley Research Center and the College of William and Mary under contract with the National Aeronautics and Space Administration. A. Predoi-Cross was supported by the National Sciences and Engineering Research Council of Canada.