

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

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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 $^{12}\text{CH}_4$ 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.

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