

## FORMALDEHYDE: THE 5.7 $\mu\text{m}$ AND 3.6 $\mu\text{m}$ BANDS

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The goal of this study was to achieve absolute line intensities and reliable line broadening parameters for the strong 5.7  $\mu\text{m}$  and 3.6  $\mu\text{m}$  bands of formaldehyde ( $\text{H}_2\text{CO}$ ) and to generate, for both spectral regions, a complete linelist for atmospheric applications.

High-resolution Fourier transform spectra were recorded at LADIR for the whole 1600 - 3200  $\text{cm}^{-1}$  spectral range and for different path-length-pressure products conditions. Using these spectra, a large set of  $\text{H}_2\text{CO}$  individual line intensities<sup>a</sup> and of self- and  $\text{N}_2$ -broadening linewidths<sup>b</sup> were measured.

The calculated band intensities derived for the 5.7  $\mu\text{m}$  and 3.6  $\mu\text{m}$  bands are in excellent agreement with the values achieved recently by medium resolution band intensity measurements. It has to be mentioned that intensities in the 3.6  $\mu\text{m}$  achieved in this work are, on the average, about 28 % stronger than those quoted in the HITRAN 2004 database. The linelist of positions and intensities based on this work<sup>a</sup> has been included in the HITRAN 2008 database.

Concerning the linewidths, empirical expansions and theoretical calculations (semi-classical Robert-Bonamy formalism) have been performed and compared to the measurements. Rotational dependences have been studied, and the temperature dependence of the  $\text{N}_2$ -broadening coefficients has been calculated.

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<sup>a</sup>A. Perrin, D. Jacquemart, F. Kwabia-Tchana, and N. Lacome, JQSRT 110,700-716,2009.

<sup>b</sup>D. Jacquemart, A. Laraia F. Kwabia-Tchana, R.R. Gamache A. Perrin and N. Lacome, JQSRT in press.