

HIGH RESOLUTION SPECTROSCOPY OF CO₂ IN THE 4500 – 7500 CM⁻¹ REGION

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Several of the CO₂ rovibrational bands in the 4500 – 7500 cm⁻¹ region are excellent candidates for atmospheric remote sensing; however, many crucial global carbon cycle science questions require atmospheric CO₂ retrievals with a precision approaching 1 ppmv. Such precise retrievals require that line positions and line intensities be known with greater accuracy than is currently available. The positions and intensities of transitions due to hot bands as well as the less abundant ¹³CO₂, ¹⁸OCO and ¹⁷OCO isotopomers must also be well characterized since these transitions necessarily have different temperature characteristics and may perturb the CO₂ retrieval. Using spectra recorded on the Kitt Peak FTS, we have reanalyzed the line positions for more than 50 vibrational states with energies up to 7700 cm⁻¹. Comparisons made to the HITRAN database show good agreement for the strong ¹²CO₂ transitions but discrepancies ranging from 0.003 to 0.0100 cm⁻¹ for many of the weaker hot band and isotopomer transitions.