SPECTRAL LINE PARAMETERS INCLUDING LINE MIXING AND SPEED DEPENDENCE IN THE P- AND R-BRANCHES OF $^{16}O^{12}C^{16}O$ BROADENED WITH ARGON AT 6348 cm^{-1}

D. CHRIS BENNER, V. MALATHY DEVI, *Department of Physics, The College of William and Mary, Williamsburg, VA 23187-8795*; LINDA R. BROWN, CHARLES E. MILLER, ROBERT A. TOTH, *Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91109*.

Previously, intensity and line shape parameters using the Voigt profile modified by line mixing using the relaxation matrix formulation and speed dependence were measured for the 30012 ← 00001 band of $^{16}O^{12}C^{16}O$ from self-broadened and air-broadened spectra.[a] To maximize the accuracies of the retrieved parameters, the multispectrum nonlinear least squares retrieval technique[b] used in that study was modified to adjust the rovibrational constants (G, B, D, . . .) and intensity parameters rather than retrieving the individual line positions and intensities. The entire spectral region of the band and all of the spectra were included in a single fit. The spectra were recorded with the McMath-Pierce Fourier transform spectrometer (FTS) and the 6-m base path White-type cell at the National Solar Observatory on Kitt Peak, AZ. The absorption paths range between 25 and 121 m and the total gas pressures varied from 11 to 900 Torr. In the present study, using the same FTS and absorption cell, we replaced the air-broadened spectra with six CO_2-Argon spectra and measured Argon-broadened CO_2 width and shift coefficients, off diagonal relaxation matrix element coefficients and speed dependence parameters for transitions in the same band. To preserve the accuracies in line positions, intensities, self-broadened width and shift coefficients, and the self induced line mixing obtained in our previous analysis, those parameters were held fixed to their previous values and only the argon broadened widths, shifts, line mixing and speed dependence were adjusted in the present fit. Values of broadening, shifts, line mixing and speed dependence parameters obtained for self-, air- and argon-broadening will be compared. Comparison of Argon broadening from the present study with results reported in the literature[c] will be made. Argon-broadened width and shift coefficients were also determined for several transitions in the weak 31112←01101 band.

[a] V Malathy Devi et al. *JMS*, accepted for publication, 2007.
[b] D. Chris Benner et al. *JQSRT* **53**, 705-721, 1995.
[c] Valero and Suarez *JQSRT* **19**, 579-90, 1978.