AIR-BROADENED LINE WIDTHS AND SHIFTS IN THE $\nu_3$ BAND OF $^{18}$O$_3$ AT TEMPERATURES BETWEEN 160 AND 300 K

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The 9.6-$\mu$m bands of O$_3$ are used by many remote-sensing experiments for retrievals of terrestrial atmospheric ozone concentration profiles. Line parameter errors can contribute significantly to the total errors in these retrievals, particularly for nadir-viewing. We have used the McMath-Pierce Fourier transform spectrometer at the National Solar Observatory on Kitt Peak to record numerous high-resolution infrared absorption spectra of O$_3$ broadened by various gases at temperatures between 160 and 300 K. Over 25 air-broadened spectra were analyzed simultaneously using a multispectrum nonlinear least squares technique to determine Lorentz pressure-broadening and pressure-induced shift coefficients along with their temperature dependences for selected P- and R-branch transitions in the $\nu_3$ fundamental band of $^{18}$O$_3$. We have compared the present results with other measurements reported in the literature for O$_3$ broadened by air or by N$_2$.

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