Supporting information for manuscript: "Temperature and pressure dependence of high-resolution air-broadened absorption cross sections of NO_2 (415-525 nm)"

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Work Info: Absolute absorption cross-sections of NO_2 were measured with a high-resolution Fourier transform spectrometer at Kitt Peak National Solar Observatory.

The spectra were recorded in synthetic air at a 0.060 cm^{-1} resolution in the 415-525 nm range with a high-precision Fourier-transform spectrometer. The measurements were conducted for a range of pressures (1-760 Torr) and temperatures (220-298 K), which are representative of typical tropospheric and stratospheric conditions. Maximum uncertainty for the reported absolute absorption cross sections is 7% (two sigma), which is primarily limited by the light source drifts and by uncertainties in NO_2 concentrations. Note that the error is likely to be largest at the edges of the spectral range studied here; 5% is probably a better conservative estimate for the middle of the investigated range. The wavelength (referred to vacuum) accuracy is 0.011 cm^{-1} (2.8×10^{-4} nm at 500 nm) and precision is 0.0022 cm^{-1} throughout the investigated wavelength range.

File Info: All files are compressed using "ZIP" standard. Data are saved as individual columns of ASCII text data with 4 significant digits of precision. Absorption cross section units are cm^2/molecule; natural logarithm base. Vacuum wavenumber scale in cm^{-1} is saved in a separate

file with 10 significant digits of precision (file name "wavenumber_scale.zip"). Alternatively, the vacuum wavenumber scale can be reconstructed from the following end values: Start = 18000.023179375 cm^{-1}; End = 24499.973540343 cm^{-1}. File names follow convention "S##_XXXXP_YYYYT.zip", where XXXX is pressure in Torr, YYYY is temperature in K, ## is scan number (not important). Pressures and temperatures used are listed in the table below. You can also download I_2 calibration scans "s27_I2.zip" and "s44_I2.zip", and a combined I_2 / NO_2 calibration scan "s54_I2_NO2.zip".

P (Torr)	T (K)	$[NO_2]$ (#/cm^3)	$[N_2O_4]$ (#/cm^3)
596.10	298.6	1.33E+15	4.82E+11
302.20	298.8	1.33E+15	4.76E+11
151.00	298.9	1.34E+15	4.77E+11
75.45	298.6	1.32E+15	4.75E+11
1.99	298.4	3.01E+15	2.51E+12
0.49	298.2	7.51E+14	1.58E+11
760.50	273.2	2.07E+15	9.20E+12
421.50	273.0	2.01E+15	8.83E+12
151.20	272.9	1.77E+15	6.93E+12
1.24	272.6	2.05E+15	9.57E+12
309.50	249.6	1.53E+15	4.98E+13
309.00	249.5	1.53E+15	5.05E+13
1.85	249.2	2.97E+15	1.97E+14
233.80	230.8	1.67E+15	5.18E+14
1.67	229.2	1.81E+15	7.48E+14
211.30	228.7	1.41E+15	4.89E+14
117.84	226.6	1.37E+15	6.01E+14
300.50	214.7	1.58E+15	4.07E+15
155.30	214.7	1.61E+15	4.24E+15
41.27	214.0	1.61E+15	4.66E+15
5.07	215.1	1.72E+15	4.49E+15