TEMPERATURE DEPENDENT OZONE ABSORPTION CROSS SECTIONS FOR SATTELITE SPECTROMETERS: NEW LABORATORY MEASUREMENTS

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We report on the work devoted to the up-to-date measurements of the ozone absorption cross-sections. The main goal of the project is to produce a consolidated and consistent set of high resolution cross-sections for satellite spectrometers series that allows a derivation of the harmonized long term data set. It is expected that five atmospheric chemistry instruments will provide two or more decades (1995 - 2020) of ozone observations. Information from different sensors has to be combined for a consistent long-term data record, since the lifetime of individual satellite missions is limited.

The harmonization of cross-sections is strongly supported by new experimental work. New laboratory measurements of ozone cross-section are underway that will improve a) absolute scaling of cross-sections, b) temperature dependence of cross-sections and c) wavelength calibration. We take advantage of a Fourier transform spectrometer and Echelle spectrophotometer to extend the dynamic range of the system (covering several orders of magnitude in cross-sections from UV up to the near IR). Measurements cover the spectral range 220 - 1000 nm at a spectral resolution of 0.02 nm in UV/VIS with absolute intensity accuracy of at least 2 percents, and wavelength accuracy better than 0.001 nm in the temperature range 193-293 K in 10 K steps. A lot of attention is paid to the accuracy of determining the temperature of the ozone flow and new methods for absolute calibration of relative spectra.

New cross-sections dataset will improve significantly the ozone data quality and time series as required for climate, air quality, and stratospheric ozone trend studies. Updated ozone cross-sections will be available for reprocessing with satellite spectrometers and to the scientific community as well.