BROADBAND OZONE ABSORPTION CROSS SECTIONS IN NEAR UV - NEAR IR

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The global monitoring of the ozone concentration using both satellite borne and ground based instruments plays a key role in the determination of the long-term trends for the stratospheric ozone layer and air quality related studies. The requirement to measure small changes in stratospheric and tropospheric ozone places strong demands on the accuracy of the ozone absorption cross-sections used in retrievals of the spectra delivered by remote sensing spectrometers.

We report on the new dataset, which uniquely combines spectral resolution as high as 0.02 nm with a broad spectral coverage from 220 nm to 1100 nm for convenient use in various current and future projects. The new dataset enables the accurate convolution with the slit functions of all currently relevant ground based and satellite based remote sensing instruments. The absolute accuracy of about three percent or better for most of the spectral range, and wavelength accuracy better than 0.005 nm, has been achieved at eleven temperatures from 195 to 293K.

New dataset includes regions poorly covered so far. In overlapping regions comparison of the new ozone cross-sections with the previously available datasets shows good agreement within the uncertainty limits. We provide analysis of the consistency of our dataset and report on the impact of the new data on the ozone retrievals based on tests performed by different groups.

We believe that the new cross-sections have inherited and combined the advantages over the previous datasets to the maximum possible extent. New dataset is available for scientific community. We hope that groups working on the ozone observations will find new dataset useful on a long-term basis.