HARMONISATION OF GOME, SCIAMACHY AND GOME-2 OZONE CROSS-SECTIONS

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The generation of long-term datasets of atmospheric trace gases is a major need and prerequisite for climate and air quality related studies. In particular ozone is an important species in the stratosphere (UV protection) and troposphere (air pollution, climate gas). The global monitoring capabilities of satellite borne atmospheric chemistry sensors play a unique role in the determination of long term trends.

Currently there are three atmospheric chemistry instruments with a high potential of synergy in orbit: the Global Ozone Measuring Experiment (GOME), the Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY), and GOME-2. Two more satellites, each carrying a GOME-2 spectrometer are planned to be launched five years apart in the next decade. It will result in a time series covering two or more decades of ozone observations. As the lifetime of individual satellite missions is limited, information from different sensors needs to be combined.

The goal of the current work is to derive a consolidated and consistent set of absorption cross-sections in the UV/visible spectral region for GOME, SCIAMACHY, GOME-2 series that allows the derivation of a harmonized long term data set.

The harmonization of cross-sections is carried out by a combination of re-evaluation of the cross-sections measured in laboratory pre-flight with the satellite spectrometers and of new experimental work to improve upon the absolute scaling of the available cross-section data. This work is in progress. Based on the results from the work, it is expected that the ozone data quality and time series will improve significantly as required for climate, air quality, and stratospheric ozone trend studies. As a delivery updated ozone cross-sections will be available for reprocessing with GOME, SCIAMACHY and GOME2 and to the scientific community as well.

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