



Homogenization of UV-Visible NDACC spectrometers reprocessing for ozone and NO₂

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SAOZ is a ground-based UV-Visible zenith-sky spectrometer deployed since 1988 at a number of NDACC (Network for the Detection of Atmospheric Composition Change) stations at all latitudes on the globe. The instrument is providing ozone and NO₂ total columns at sunrise and sunset using the Differential Optical Absorption Spectroscopy (DOAS) technique in the visible spectral range. SAOZ observations have been used extensively to validate various atmospheric chemistry satellite instruments such as nadir viewing TOMS, GOME, SCIAMACHY, OMI and GOME-2.

The NDACC UV-Visible working group initiated a tentative homogenization of ozone and NO₂ processing of all UV-Vis zenith sky spectrometers as one of its objectives. The first recommendation is concerning the total ozone retrieval. A significant change for the SAOZ network is the use of different cross-sections (O₃, NO₂, H₂O, O₄, and Ring calculations) and different spectral window fitting range, which leads to a recalculation of the slant columns. In addition, it is recommended to use a climatological air mass factor (AMF) instead of an annual AMF usually used in standard SAOZ processing.

Here we present the results of comparisons between TOMS (since 1988), GOME (since 1995), SCIAMACHY (since 2002), OMI (since 2004), GOME-2 (since 2006) and SAOZ at all latitudes – tropics, mid-latitudes and Polar Regions - in both hemispheres. In the case of ozone, the NDACC recommendations resulted in a significant improvement of the differences between ground-based SAOZ and measurements from space. Preliminary results of NO₂ SAOZ columns, using climatological AMF, are also presented and compared to different satellites, such as GOME, SCIAMACHY and OMI.