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Operational O3M-SAF trace gas column products: GOME-2 NO2, BrO, SO2, CH2O, and H2O

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This contribution focuses on the operational GOME-2 trace gas column products developed in the framework of EUMETSAT's Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring (O3M-SAF). We present an overview of the retrieval algorithms and exemplary results for NO2, BrO, SO2, CH2O and H2O. These trace gas column products are retrieved from GOME-2 solar backscattered measurements in the UV and VIS wavelength regions, and are generated operationally by DLR using the GOME Data Processor (GDP) version 4.4.

Total and tropospheric NO2 is retrieved with the Differential Optical Absorption Spectroscopy (DOAS) method in the 425-450 nm wavelength region. The GOME-2 NO2 product is available for the users in near real time, i.e. within two hours after sensing. SO2 emissions from volcanic and anthropogenic sources can be measured by GOME-2 using the UV wavelength region around 320 nm. For BrO and CH2O, optimal DOAS fitting windows have been determined for GOME-2 in the UV wavelength region. H2O columns are retrieved with the classical DOAS retrieval in the visible spectral range. The GOME-2 SO2, BrO, CH2O and H2O products have reached the operational O3M-SAF status, and are routinely available to the users.

More than four years of operational trace gas column measurements are now available from GOME-2. We present validation results using ground-based measurements, as well as comparisons with other satellite products, such as those from SCIAMACHY and OMI. The use of tropospheric NO2 and CH2O columns for air quality applications will be presented, and we will show examples of SO2 measurements from volcanic eruptions and anthropogenic emissions. Finally, exemplary GOME-2 measurements of H2O will be shown.