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

Nan Hao (1), P. Valks (1), I. De Smedt (2), S. Emmadi (1), J. -C. Lambert (2), D. Loyola (1), G. Pinardi (2), M. Rix (1), M. Van Roozendael (2), and N. They (2)

(1) German Aerospace Centre, Remote Sensing Technology Institute (DLR-IMF), (2) Belgian Institute for Space Aeronomy (BIRA-IASB)

This contribution focuses on the operational GOME-2 trace gas column products developed at the German Aerospace Centre, 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 and CH2O. These trace gas column products are retrieved with the GOME Data Processor (GDP) version 4.4 using the Differential Optical Absorption Spectroscopy (DOAS) method in the UV and VIS wavelength regions.

Total NO2 is retrieved in the 425-450 nm and an additional algorithm is applied to retrieve the tropospheric NO2 column for polluted conditions. The operational 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. The GOME-2 SO2, BrO and CH2O products have reached the operational O3M-SAF status, and are routinely available to the users.

More than three years of operational trace gas column measurements are now available from GOME-2. We present initial 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, SO2 and CH2O columns for air quality applications will be presented, including temporal evolution analyses for China. Furthermore, we will show examples of BrO under polar winter conditions.