Geophysical Research Abstracts
Vol. 14, EGU2012-11741, 2012
EGU General Assembly 2012

Tropospheric trace-gas column observations from GOME-2 for air quality applications

P. Valks (1), N. Hao (1), D. Loyola (1), W. Zimmer (1), I. De Smedt (2), G. Pinardi (2), J.-C. Lambert (2), M. Van Roozendael (2), and A. Delcloo (3)

(1) German Aerospace Center, Remote Sensing Technology Institute, Wessling, Germany (pieter.valks@dlr.de), (2) BIRA-IASB Belgian Institute for Space Aeronomy, Brussels, Belgium, (3) RMI Royal Meteorological Institute of Belgium, Brussels, Belgium

This contribution focuses on the tropospheric GOME-2 trace gas column products developed in the framework of EUMETSAT's Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring (O_3M-SAF). We present an overview of the retrieval algorithms for tropospheric NO_2, SO_2, CH_2O and (sub)-tropical tropospheric ozone, and we show examples of air quality applications using GOME-2 observations.

The tropospheric trace gas column products are retrieved from GOME-2 solar backscattered measurements in the UV and VIS wavelength regions using the GOME Data Processor (GDP) version 4.5. Tropospheric NO_2 is retrieved with the Differential Optical Absorption Spectroscopy (DOAS) method in the 425-450 nm wavelength region. SO_2 emissions from anthropogenic sources can be measured by GOME-2 using the UV wavelength region around 320 nm. The GOME-2 NO_2 and SO_2 products are available in near real time, i.e. within two hours after sensing. For CH_2O, an optimal DOAS fitting windows around 335 nm has been determined for GOME-2. Tropospheric ozone columns for sub-tropical areas are derived from GOME-2 observations using a cloud slicing method. The GOME-2 tropospheric NO_2, SO_2, and CH_2O products have reached the operational O_3M-SAF status, and are routinely available to the users.

The use of tropospheric trace gas observations from GOME-2 for air quality applications will be illustrated for China and Europe. Time-series of tropospheric ozone, NO_2, SO_2 and CH_2O for the Pearl River Delta in Southern China (including Hong Kong) are analysed to investigate possible trends in air pollutants. This highly populated sub-tropical area frequently suffers severe episodes of photochemical smog. Furthermore, comparisons of tropospheric GOME-2 observations with ground-based measurements from several sites in Europe and China will be presented.