



Improvement of total and tropospheric NO₂ column retrieval for GOME-2

Song Liu (1), Pieter Valks (1), Gaia Pinardi (2), Isabelle De Smedt (2), Yu Huan (2), and Steffen Beirle (3)

(1) Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Methodik der Fernerkundung (IMF), Oberpfaffenhofen, Germany, (2) Belgian Institute for Space Aeronomy (BIRA-IASB), Brussels, Belgium, (3) Max-Planck-Institut für Chemie (MPI-C), Mainz, Germany

This contribution focuses on the development and refinement of novel scientific algorithms for the retrieval of total and tropospheric nitrogen dioxide (NO₂) columns for the GOME-2 satellite instrument.

NO₂ plays significant roles in atmospheric chemistry. It is strongly related to ozone destruction in the stratosphere, and is regarded as an important air pollutant and ozone precursor in the troposphere. Total NO₂ columns from GOME-2 are retrieved with the Differential Optical Absorption Spectroscopy (DOAS) method using the large 425-497 nm wavelength fitting window in order to increase the signal to noise ratio. The tropospheric NO₂ column is derived using an improved Stratospheric-Tropospheric separation (STS) algorithm, followed by an air mass factor (AMF) conversion calculated with the LIDORT model. For the calculation of the tropospheric AMF, improved GOME-2 cloud parameters are used and a new surface albedo (LER) climatology based on GOME-2 observations for 2007-2013 is applied.

We present the improvements in the NO₂ retrieval algorithm, and we show examples of air quality applications with GOME-2 NO₂ data.