Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03257, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03257
EGU General Assembly 2008

Impact of aerosol on the NO_2 airmass factors used for satellite retrievals

J. Leitao, A. Richter, A. Heckel and J.P. Burrows

IUP - Universität Bremen, Otto-Hahn-Allee 1, P.O. BOX 33 04 40, D-28334 Bremen, Germany (jleitao@iup.physik.uni-bremen.de / Phone: 0049-421-2184474)

Satellite instruments such as GOME, GOME-2, SCIAMACHY, OMI perform measurements of the backscattered solar radiation from which trace gas distributions in the atmosphere can be retrieved. These data are of growing importance to investigate the global distribution of pollutants such as nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and several others. With the satellite derived global fields one can identify emission sources and analyse long-term trends of pollutant concentrations.

As in all remote sensing techniques, the retrieval of tropospheric columns of NO_2 from the satellite measurements is based on several assumptions that in one way or another contribute to the uncertainty in the final retrieval. While some of these factors are well known others are highly uncertain and variable. To obtain the vertical column of NO_2 one must divide the slant column obtained from satellite measurement by an airmass factor (AMF). This AMF is dependent on many aspects such as: geometry and wavelength of measurement, vertical distribution of the species, surface albedo, aerosol loading and clouds. Since the impact of all these factors in the retrieval is not yet well understood and quantified, a sensitivity study is highly required and essential to prioritise necessary improvements.

It is known that the presence of aerosols has an impact on the measurements of tropospheric NO_2. Therefore, in this poster, we investigate how different aerosol properties (e.g.: aerosol optical thickness, composition, height of layer) can influence the AMF and consequently the retrieval of tropospheric NO_2 for different scenarios such as anthropogenic pollution and biomass burning.