

# **A UV NO<sub>2</sub> DOAS retrieval for satellite data from GOME-2/MetOp-A -**

## **A possibility to detect NO<sub>2</sub> vertical distribution**

Lisa Behrens (IUP)

NO<sub>2</sub> is an important indicator for air pollution from anthropogenic as well as natural sources. NO<sub>2</sub> emission sources and their horizontal distribution are well known from satellite measurements. In contrast, knowledge of the vertical NO<sub>2</sub> distribution is only limited. To address this issue satellite observations from GOME-2 on board of EUMETSAT's MetOp-A were used to develop a new NO<sub>2</sub> retrieval with the DOAS method. In this retrieval, we derive NO<sub>2</sub> slant columns from measurements in the UV spectral range. This new UV NO<sub>2</sub> retrieval is compared to a common NO<sub>2</sub> retrieval in the visible spectral range.

To investigate the different vertical sensitivities in the two wavelength regions, box air mass factors were calculated with the radiative transfer model SCIATRAN. According to these box air mass factors, the sensitivity for NO<sub>2</sub> above 9 km is higher in the UV compared to the visible spectral range. Below 9 km the sensitivity is clearly higher in the visible spectral range.

The NO<sub>2</sub> slant columns derived from the visible spectral range are mostly higher than in the UV spectral range. Nevertheless, in some regions our new NO<sub>2</sub> retrieval agrees well with the common NO<sub>2</sub> retrieval from the visible spectral range. In the UV, well known NO<sub>2</sub> signals over highly polluted areas (e.g., China) are observed, albeit at lower levels than in the visible. Also over biomass burning regions (e.g., southern Africa), NO<sub>2</sub> signals are detected. However in some areas, NO<sub>2</sub> signals clearly visible in the visible spectral range cannot be detected in the UV spectral range, such as in northern Africa over the biomass burning regions. From these differences in NO<sub>2</sub> slant columns, we can in principle gain insight into the vertical distribution of NO<sub>2</sub>.