

## **BOREAS - A new MAX-DOAS profile retrieval algorithm**

**Tim Bösch**  
(IUP)

### **Abstract**

Differential Optical Absorption Spectroscopy (DOAS) is a well-known, versatile, and frequently used technique for the analysis of trace gases within the atmosphere. Although ground based MAX-DOAS measurements at different elevation angles have been used for several years to investigate the distribution of trace gases and aerosols, the retrieval of vertical profiles is still a difficult task and results of well-established algorithms differ strongly.

Here, IUP Bremen's new profile retrieval algorithm BOREAS (**B**remen **O**ptimal estimation **R**etrieval for **A**erosols and trace gase**S**) is introduced and applied to synthetic data computed with the radiative transfer model SCIATRAN.

The results indicate that commonly used regularization tends to give too much weight to the measurement which results in oscillating profiles with possible negative values. A detailed comparison of different types and strengths of regularization dependencies is shown and the results indicate that the choice of the a priori profile itself is an important factor.

Furthermore, the above mentioned results are used to improve the profiles retrieved from real data measured during the CINDI-2 campaign in Cabauw in summer 2016.