



## **Investigating the influence of horizontal inhomogeneity on the MAX-DOAS retrieval of trace gases and aerosols**

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The MAXDOAS (Multi-AXis Differential Optical Absorption Spectroscopy) method is used for many years to retrieve vertical profiles of trace gases (e.g. NO<sub>2</sub>, HCHO, SO<sub>2</sub>) and aerosols. With the new generation of instruments with variable azimuth angle pointing it is thus generally possible to gain information about the 3D spatial distribution of aerosols and trace gases. For this work data is used from the MADCAT campaign, which took place in Mainz, Germany, in summer 2013.

The light path is heavily influenced by the profile of aerosols, therefore the retrieval is performed in two steps: first the aerosol profile is retrieved, then this information is used to gain the trace gas profile. We use a parameterized retrieval called II-MAX (Profile Inversion for MAX-DOAS measurements). Up to now the aerosol is assumed to be horizontally homogeneous distributed. As a first step we will now calculate the aerosol profiles in different azimuthal directions to estimate the strength of the inhomogeneity regarding the aerosols. These results are then used to investigate and estimate the influence on the trace gas retrieval.

The aerosol profiles retrieved with II-MAX are compared to ceilometer measurements and sun photometer measurements on the site.