



## **First results from novel 4-azimuth MAX-DOAS measurements in Mainz, Germany**

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Multi-Axis (MAX-) DOAS instruments observe scattered sun light under various mostly slant elevation angles. From such observations information on tropospheric profiles of trace gases and aerosols can be retrieved. MAX-DOAS observations can be used to quantify emissions, to study chemical processes in the atmosphere and to validate satellite observations of tropospheric trace gases.

Usually, MAX-DOAS observations use only one azimuth direction. Here we present MAX-DOAS measurements, which are simultaneously performed at four azimuth directions. These measurements allow to derive additional information on horizontal gradients of atmospheric trace gases and aerosols close to the surface. Such information is in particular interesting for two applications: first, it is important for satellite validation because of the large ground pixel sizes. In addition it can be used to quantify possible errors of the MAX-DOAS profile retrievals in the presence of such gradients and horizontal transport. In such cases, the resulting temporal variations affect the trace gas absorptions obtained during one elevation sequence.

We describe the set-up and the technical features of our novel MAX-DOAS instrument and give an overview on the measurement strategies. We present the first analysis results of the NO<sub>2</sub> and aerosol distributions.