

Measurements of Horizontal and Vertical Variability of Atmosphere Pollutants Using a Combination of Small-scale Sensors and Remote Sensing Techniques

Mark Wenig¹ and Ye Sheng¹

¹ Ludwig Maximilian University Munich, Munich, Germany, E-mail: mark.wenig@lmu.de

In several German cities the air quality standards for NO₂ are exceeded frequently. Therefore, it is important to identify the NO₂ sources and to study the human exposure to the highly variable distribution of atmospheric pollutants in different areas. In order to do so, we use a combination of remote sensing techniques and small-scale sensors (Electrochemical Sensors, ECS). The advantage of the ECSs is, that they are low-cost, light weight and portable. In order to ensure measurement data quality frequent calibrations of the sensors are needed. We use a Cavity-Enhanced Differential Optical Absorption Spectroscopy (CE-DOAS) instrument for the calibration before and after each measurement campaign. We performed on road measurements using our measurement bus, as well as a bike trailer, and combined the mobile measurements with simultaneous stationary Long-Path DOAS measurements in order to construct a consistent concentration map of different cities. Furthermore, we used airborne sensors on a UAV, glider planes and a Zeppelin to measure vertical profiles.