Contribution ID: **53** Type: **Poster**

Unmanned in situ Measurements of Air Pollutants in the Planetary Boundary Layer

Thursday 22 June 2023 16:45 (1 hour)

Regional air quality has been historically documented by ground-level monitoring networks around the world. However, such monitoring infrastructures come with high costs and very localized measurements that are limited to ground observations. Higher altitude measurements (up to 1 km) are of great interest for understanding the mixing and transport of pollutants. Unmanned aerial vehicles (UAVs) are promising candidates to fill this gap. Electrochemical sensors (ECS) are lightweight, small, require little energy and are thus an ideal candidate for use on UAVs, but require calibration due to interferences. We did an in-flight evaluation of ECS on a Zeppelin, covering cities, industrial areas, and highways. A correction method based on temperature and humidity dependencies was developed to accurately measure NOx concentrations. Ongoing validation involves controlled laboratory experiments simulating changing meteorological conditions. The combination of UAVs and ECS provides a flexible platform for in situ trace gas measurements in the lower troposphere.

Primary author: SCHULDT, Tobias (Forschungszentrum Jülich GmbH)

Co-authors: GRASSE, Achim (Forschungszentrum Jülich GmbH); SCHLERF, Andreas (TU Braunschweig); SOBOTTA, André (Federal Highway Research Institute (BASt)); Prof. KIENDLER-SCHARR, Astrid (Forschungszentrum Jülich GmbH); Dr LAMPERT, Astrid (TU Braunschweig); WESOLEK, Christian (Forschungszentrum Jülich GmbH); Dr GKATZELIS, Georgios I. (Forschungszentrum Jülich GmbH); BRETSCHNEIDER, Lutz (TU Braunschweig); Dr BUCHHOLZ, Marcel (Federal Highway Research Institute (BASt)); Dr TILLMANN, Ralf (Forschungszentrum Jülich GmbH); SELDSCHOPF, Rickmar (Federal Highway Research Institute (BASt))

Presenter: SCHULDT, Tobias (Forschungszentrum Jülich GmbH)

Session Classification: Poster Session

Track Classification: New observational systems and sources of information