

**Seminar on Physics and Chemistry of the Atmosphere
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**Enhancing the quality of greenhouse gas
remote sensing observations by analyzing
detector effects**

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Abstract

There is a great uncertainty in the estimation of anthropogenic and natural Methane (CH₄) sources, regional up to ~85 % (Global Methane Budget 2017). Since CH₄ is the second most important greenhouse gas with a relatively short lifetime in the atmosphere of ~9 years, a better understanding and reduction of anthropogenic point sources can have a relative fast impact on the global radiative forcing, in comparison to CO₂. To increase the knowledge of emissions from CH₄ sources, high precision measurement systems are required. One new approach is airborne remote sensing of greenhouse gases, which provides atmospheric concentration measurements with a high spatial resolution (25x25m), to derive emission and support validation of satellite measurements.

In this talk I will introduce you to the Methane Airborne Mappers, MAMAP2D and MAMAP2D light. The accuracy of these systems is determined by atmospheric and instrumental uncertainties. One of the instrument error sources is the ill known detector effect Dark Signal Shift (DSS), which adds an intensity dependent zero-level offset (ZLO) to the measured spectra. To get a first impression of the impact of the DSS to the retrieved concentrations, within this talk initial simulation results based on newly gathered data of the MAMAP2D detectors will be shown and the impact on CH₄ and CO₂ concentration measurements will be discussed.