



## **Airborne Measurements of Methane Fluxes over Mid-Latitude and Sub-Arctic Wetlands**

J. Hartmann (1) and T Sachs (2)

(1) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, (2) GFZ German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany

For a quantification of the natural GHG budget of the atmosphere the emission of methane from the vast arctic wetlands need to be assessed accurately. The conventional methods of flux measurements made by closed chambers and eddy towers need to be upscaled, introducing a potentially large source of uncertainty, due to the heterogeneity of the emitting sources at the surface.

In order to obtain a large area coverage and thus a higher spacial representativeness we performed airborne measurements of methane fluxes over mid-latitude and sub-arctic wetlands, for flight legs of tens of kilometres length.

We installed a fast trace gas analyser, a Los Gatos RMT200, in the research aircraft Polar 5, together with the noseboom mounted turbulence sensor package.

Measurement flights have been carried out in June 2011 over wetlands in Germany and in northern Finland in a convectively mixed boundary layer. Reference data have been obtained at the surface by tower mounted eddy correlation measurements.

A spectral analysis of the first measurements shows that the system is well suitable to measure the vertical flux of methane from natural surfaces transported by the dominating eddies in the convective boundary layer. Our flux measurements compare well to those obtained at the surface.

On the high-frequency end of the spectrum the measurement accuracy is not sufficient to resolve the inertial subrange.