Geophysical Research Abstracts
Vol. 12, EGU2010-5081, 2010
EGU General Assembly 2010

First measurements of aerosols on a ZEPPELIN airship

Ralf Tillmann, Thomas F. Mentel, Astrid Kiendler-Scharr, and Andreas Wahner
Institut für Chemie und Dynamik der Geosphäre, ICG-2, Forschungszentrum Jülich, Germany (r.tillmann@fz-juelich.de)

In summer 2007 and autumn 2008 the airship ZEPPELIN NT was equipped with a suite of instruments to measure the distribution of different trace gases, short-lived radicals and aerosols in the planetary boundary layer together with radiation fluxes and meteorological parameters. A condensation particle counter (CPC, TSI Inc.) and a scanning mobility particle sizer (SMPS, TSI Inc.) were used to measure the total number concentration of atmospheric aerosols and their number size distribution. The measurements were carried out over forested, rural and urban areas in southern Germany as well as over Lake Constance. The performed flight patterns were vertical profiles above selected areas and regional flight tracks within a defined height above the ground.

The observed aerosol number concentrations during the two campaign periods cover a range between 500 and 40000 cm^{-3}, dependent on the area investigated, meteorological parameters and flight height. Height resolved measurements of aerosol number concentrations predominately show that the aerosol concentration decreases with height. Since primary aerosols and precursors of secondary aerosols have their sources near the surface, aerosol concentrations are normally expected to be lower at higher altitudes. Results of the SMPS-measurements show bi- and tri-modal aerosol size distributions in a particle diameter range of 13 – 750 nm. The results of the aerosol measurements will be discussed together with meteorological parameters and trace gas measurements.