Geophysical Research Abstracts,
Vol. 11, EGU2009-12500, 2009
EGU General Assembly 2009

Results from the ICOS Fall 2008 intensive campaign for boundary layer height detection and greenhouse gases vertical distribution study at Orleans forest, France.

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An intensive field campaign of three weeks has been carried out in October 2008 in Orléans Forest, France, dedicated 1/ to the assessment of different instrument types for retrieval of the continental boundary layer (CBL) height and 2/ to the study of vertical distribution and diurnal cycle of atmospheric greenhouse gases (GHG). This campaign occured in the framework of ICOS (Integrated Carbon Observing System) which is one of the infrastructures selected in the ESFRI roadmap. ICOS aims at getting a homogeneous and dense network for greenhouse gases monitoring in Europe operating for the next 25 years. Launched in 2008, ICOS is currently in its preliminary phase (until 2012). One current mandatory step is to identify the instrumentation that will be deployed in the stations of the network. All stations will be equiped with GHG analysers, as well as CBL probes to allow calculation of GHG budget in the CBL. During the campaign, one Lidar, one ceilometer and one cloud telemeter have been intercompared for CBL height detection. Radiosoundings have been carried out simultaneously to serve as a reference for this intercomparison. In parallel, GHG (and especially CO2) in-situ measurements have been recorded at four altitude levels on a tall tower (5m, 50m, 100m and 180m), between 100m and 3000m using in-situ and flask sampling instruments onboard a small aircraft, and between the surface and 200m using a probe attached to a captive balloon deployed by Meteo France. We will hereby present ICOS, the test site, the instrumentation and selected results from the intensive campaign.