

0.1 Structure parameter of temperature over heterogeneous terrain evaluated from long-path scintillometer, high resolution LES and raw eddy correlation data: the LITFASS-2003 project.

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In the context of the LITFASS-2003 field experiment (Beyrich et al., 2006) a number of large aperture scintillometers (LAS) were operated. A LAS provides weighed path-average values of the structure parameter of temperature C_T^2 . For 1 day (May 30, 2003) a high resolution (20m) LES (PALM) simulation was done. The LES domain was adapted to the heterogeneous conditions in the LITFASS area (using the CORINE-dataset with a resolution of 100m) and by considering 7 different land-use classes (water bodies, forest, grass, maize, triticale, rape and barley). Eddy-covariance stations prescribed the surface boundary conditions of the LES model and the temporal evolution of the surface fluxes of these 7 different land-use classes.

The LITFASS area corresponds to the model domain of a non-hydrostatic micro-scale model with a grid size of 100m (the LITFASS Local Model – LLM). The central part of the area represents just one grid cell ($14 \times 14 \text{ km}^2$) of the ‘Deutschland-Modell’, the operational high-resolution NWP model of DWD until the end of 1999. The landscape is heterogeneous and has been formed by the inland glaciers during the last ice age, and is characterized by slight, irregular undulations of the terrain and by the existence of a number of small and medium-sized lakes. The land use in the LITFASS area is dominated by forest (42%) and agricultural farmland (41%); other relevant surface types are lakes (7%), meadows (5%) and villages (4%). The forest is mainly situated in the western part of the area while agriculture is dominant in the eastern part. This mixture of surface types is rather typical for the whole region and even for larger parts of northern Central Europe south of the Baltic Sea.

The main objective of this study is to present a comparison between CT2 derived from scintillometers, raw LES and EC data. In addition LES and EC derived spectra will be presented and will be compared with LAS observations. Furthermore, attention will be paid to other quantities such as the (spatial variation of) fluxes of sensible heat derived from LAS, LES and EC data.

References

Beyrich, et al, 2006, The LITFASS-2003 Experiment, *Boundary-Layer Meteorology*, in press.