

Abstract

The atmospheric boundary layer (ABL) is directly affected by the underlying surface. Inhomogeneous meteorological surface forcing can yield to thermally induced circulations affecting the turbulent exchange processes in the entire ABL and the entrainment at the top of the boundary layer.

This research project studies the effect of heterogeneous meteorological forcing on the structure of the ABL using LES. Simulations based on the LITFASS-2003 experiment will be carried out to investigate exchange processes between the earth surface and the atmosphere and the state of turbulent mixing under different atmospheric conditions. Special emphasis shall be put on the analysis of the turbulent temperature and humidity fields in the ABL, in order to understand the reasons for the larger structures in the humidity fields compared to the temperature fields. Furthermore, the measurement strategies to determine area-averaged surface fluxes will be investigated and possible improvements for the measurement strategies will be derived.