

The impact of complex terrain on surface exchange processes; lessons learned from multi-scale observation campaigns

Matthias Zeeman

Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany

Do we get a better picture of the world around us if we simultaneously observe many aspects instead of a few? More samples promise unique insights into interactions that occur at different scales, separated in space and time. But does it pay off to go the extra mile?

We review recent field campaigns in complex terrain that were designed to reveal dynamic interactions in the atmosphere near the surface, in both an urban and a rural landscape. Observations were made using networks of ground-based (remote-)sensing instrumentation, including Doppler lidar, fiber-optic sensing and thermal imaging techniques. The combination of methods offered multiple levels of detail about the development of organized structures in the atmospheric boundary layer.

This seminar aims to examine how the exploration of novel micrometeorological and data sciences techniques helps advance our knowledge of fundamental aspects of atmospheric turbulence, and provides new avenues for theoretical and numerical studies of the atmospheric boundary layer.