



KITcube – A Complete Observation System for the Troposphere

C. Stawiarski, N. Kalthoff, U. Corsmeier, A. Wieser, and Ch. Kottmeier

Institute for Meteorology and Climate Research (IMK-TRO), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
(christina.stawiarski@kit.edu)

To image whole process chains in the troposphere, for example the initiation of convection and the subsequent precipitation caused e.g. by moisture variability or aerosol distribution, a large set of different measurement instruments is required. Typically individual instruments, operated by independent scientists were concentrated to fulfill this requirement. The consequence is a high effort in coordinating the individual measurements, adapting the occurring different data formats and combining the separate data sets. At the Institute for Meteorology and Climate Research (IMK-TRO) of the Karlsruhe Institute of Technology (KIT) an overall monitoring system that merges a set of state-of-the-art instruments to probe the atmosphere is therefore established – the KITcube (<http://www.imk-tro.kit.edu/english/4635.php>). The equipment spans ground-based active remote sensing instruments (radars and lidars) and passive remote sensing instruments (microwave profiler) as well as instruments for in-situ measurements at the ground (aerosol, turbulence, and radiation, measured by towers) and in the upper air (radiosondes and dropsondes). All data is collected and stored in a control unit, which is able to process a unique data format and provide real-time quick looks of the measurements. Overall the KITcube can survey an atmospheric volume of about 10 km side length allowing the temporally and spatially complete capturing of all relevant processes. The KITcube can be operated as a mobile device at arbitrary measuring locations for time periods of several weeks to months.

In the presentation the KITcube design and the data flow will be presented. Measurement examples, illustrating the interplay of the individual instruments are given (e.g. vertical turbulence profiles measured by lidars and radar) and the KITcube assignment in following international measurement campaigns is introduced.