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Aerosol measurements with a scanning rotational Raman lidar at Hornisgrinde during COPS

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The large dynamic range of the scanning rotational Raman lidar (RRL) of University of Hohenheim (UHOH) and the capability of performing various scan patterns give an unparalleled way to investigate the structures of aerosol flows. High temporal and spatial resolution of the system allows us to study dynamics of the convective boundary layer during the course of the day together with different entrainment regimes, various aerosol layers present and above all, the optical properties of the aerosols embedded in diverse structures of the atmosphere. The aerosol optical properties which are measured with RRL comprise both the aerosol backscatter coefficient and the aerosol extinction coefficient at the laser wavelength of 355 nm. Simultaneously with these aerosol measurements, the UHOH RRL allows to study the atmospheric temperature distribution [see contribution of M. Radlach et al. to this conference]. This lidar system provides a useful range of up to several kilometres depending on the optical thickness of the atmosphere and the backscatter coefficient of the particles present.

The unique capabilities of the UHOH RRL are very beneficial for atmospheric studies. During COPS (Convective and Orographically-Induced Precipitation Study, see contribution of V. Wulfmeyer et al. to this conference), the lidar was located at Hornisgrinde, the highest peak of the Northern Black Forest at 1161 m above sea level, from June to August 2007, together with a large suite of other remote sensing instruments (COPS Supersite H). During COPS, we used typically a resolution of 10 s and 3.75 m but higher temporal resolution up to 1/(50 Hz) is possible. The measurement results of COPS will be presented and discussed at DACH.