ACME-Austrian Ceilometer Evaluation (Aerosol- & Mixing Layer Heights and their Use Cases)

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Ceilometers are atmospheric Lidar (light detection and ranging) instruments that measure backscatter from water droplets and aerosols. The backscatter profiles are processed with the ACME System in near real-time and reveal cloud base heights and aerosol layers.

From these measurements, an approximation of the mixing-layer-height (MLH) is derived. The MLH timeseries are used for model evaluation, as input for atmospheric dispersion models as well as for the distinction whether air admixtures (pollutants, bacteria, fungies etc.) are observed within the boundary layer or in free troposphere.

The observed aerosol layers help to track large scale air transport events such as Sahara dust and volcanic ash plumes. Furthermore, the ceilometer measurements are used to support the analysis of weather conditions with respect to precipitation, fog formation or icing of wind turbines.

In this contribution, we will give a brief overview on the Austrian ceilometer network operated by GeoSphere Austria and Austro Control and present specific use cases for ceilometer data and derived mixing layer heights.