



## Size resolved CCN measurements during the FACE-2004 field experiment

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The FACE 2004 field experiment took place at the Taunus Observatory (Kleiner Feldberg, central Germany) in July and August 2004. As part of this project we measured cloud condensation nuclei (CCN) in various air mass conditions, including recent pollution from the industrialized Rhein - Main area, aged pollution from Eastern Europe, and relatively clean air of marine origin.

We measured CCN efficiencies (i.e., CCN divided by total particle concentration) as a function of supersaturation at different particle diameters (40, 60, 80, 100, and 120 nm), which were selected by a differential mobility analyzer upstream of the CCN counter. This method separates the effect of particle size on CCN activation from the effect of particle chemical composition, which gives new insights into the activation behavior of ambient aerosol particles. Moreover, it allows for detailed consistency studies with particle chemical composition, which was determined at the same particle diameters by a Quadrupole Aerosol Mass Spectrometer (Q-AMS).

First case studies indicate that the CCN efficiencies at selected particle diameters do not vary greatly between different aged air mass conditions, even though the particle chemical composition sometimes changes strongly, with submicron organic mass fractions ranging from 33% to 66%. This would suggest that CCN concentrations at our field site are to a first order dominated by the particle size distribution. We will

present a more comprehensive study on the factors controlling the CCN efficiencies to investigate this hypothesis more thoroughly. The presented results will include a consistency study with the Q-AMS and a comparison with a multi-component aerosol chemistry model extended to predict CCN activation.