

## Influence of cloud to the local aerosol chemical composition during the Hill Cap Cloud Thuringia 2010 (HCCT 2010) campaign

L. Poulain<sup>1</sup>, Z.J. Wu<sup>1</sup>, A. Tilgner<sup>1</sup>, D. van Pinxteren<sup>1</sup>, M. Müller<sup>2</sup>, B. D'Anna<sup>3</sup>, C. George<sup>3</sup>, J. Schneider<sup>4</sup>, S. Mertes<sup>1</sup>, A. Wiedensohler<sup>1</sup> and H. Herrmann<sup>1</sup>

<sup>1</sup> Leibniz-Institut für Troposphärenforschung, Leipzig, Germany

<sup>2</sup> Deutsches Biomasseforschungszentrum, Leipzig, Germany

<sup>3</sup> Université Lyon 1, CNRS, UMR5256, IRCELYON, Institut de Recherches sur la Catalyse et l'Environnement de Lyon, Villeurbanne, France

<sup>4</sup> Max Planck Institute for Chemistry, Particle Chemistry Department, Mainz, Germany

The impact of orographic clouds to the aerosol chemical composition was measured during the Hill Cap Cloud Thuringia 2010 (HCCT-2010) field campaign, which took place in autumn 2010 at the Schmücke mountain ridge in the Thuringia forest (Germany). The main objectives of the HCCT-2010 project were to assess the effects of clouds on particle composition, gas phase oxidant budget, changes of hygroscopic properties and activation of aerosol particles. Three sampling sites were equipped: one on the top of the Schmücke ridge, where clouds were sampled, and two valley stations located upwind and downwind of the summit. In total, four Aerodyne ToF-AMSs were deployed during the campaign. One at each valley station and two at the summit station: One downstream of a Cloud Virtual Impactor (CVI) for droplet residual analysis and one to measure interstitial particles. The AMS measurements at both valley stations were completed by PM1 Particle-into-liquid sampler measurements (PILS) and at the upwind station by a PM10 Monitor for Aerosols and Gases in ambient Air (MARGA). Based on air mass trajectories, gas tracer experiments and meteorological parameters, it is possible to identify periods during which the air mass of the three stations were connected. For these periods of connected flow the AMS results were compared in order to follow the cloud induced modification of the aerosol chemical compositions as well as modification of the chemical size distribution.