

Organic acids in bulk and size-resolved cloud water from HCCT-2010

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Hill Cap Cloud Thuringia 2010 (HCCT-2010) was a complex field campaign on aerosol cloud interaction, performed at the Schmücke mountain, Germany, in September and October 2010. During events of a hill cap cloud, a total of 86 bulk cloud water samples were taken on an hourly basis using the CASCC2 collector. Additionally, a 3-stage and a 5-stage cloud droplet collector were applied with 2 and 4 hours time resolution, respectively. Downstream of a counterflow virtual impactor (CVI) and an interstitial inlet (INT), the cloud droplet residuals and interstitial particles were sampled on quartz filters. A suite of organic acids were analysed from the samples, including short-chain dicarboxylic acids (C2 to C5) and longer-chain functionalised carboxylic acids (C5 to C10, including at least one additional functional group). Capillary electrophoresis (CE) with UV detection and CE-MS were applied for the determination. Hourly bulk cloud water concentrations of the organic acids will be discussed with regards to cloud microphysical parameters (liquid water content) and meteorology (air mass origin). The phase partitioning of the more abundant diacids, obtained from the CVI and INT filters, will also be presented. Additionally, the size distributions of the acids within several sampled clouds will be shown and the factors governing their shape will be discussed.