

Water soluble organic carbon in bulk and size-resolved cloud water from HCCT-2010

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To study different aspects of aerosol cloud interaction, the ground-based cloud experiment Hill Cap Cloud Thuringia 2010 (HCCT-2010) was performed at the Schmücke mountain ridge in Thuringia, Germany, in autumn 2010. Bulk and size-resolved cloud water samples were taken on a 20 m tower during events of a hill cap cloud. The CASCC2 cloud water collector was applied to sample a total of 86 hourly samples during the 6 weeks duration of the campaign. Additionally, a 3-stage and a 5-stage cloud droplet collector were used with 2 and 4 hours time resolution, respectively. Water soluble organic carbon (WSOC) was analysed after filtration of the samples using a TOC analyser. Downstream of a counterflow virtual impactor (CVI), the cloud droplet residuals were sampled on quartz filters, as well as characterised online by an aerosol mass spectrometer (AMS). A comparison of WSOC concentrations from cloud water and CVI filters will be given, as well as the fraction of organics measured by the AMS behind the CVI that can be explained by WSOC. Hourly bulk cloud water WSOC concentrations will be discussed with regards to cloud microphysical parameters (liquid water content) and meteorology (air mass origin). Additionally, the size distribution of WSOC within several sampled clouds will be shown and the factors governing its shape will be discussed.