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# Vertical distribution of CCN properties in the Caribbean during SALTRACE

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Mineral dust is an important component of the atmosphere and the climate system since mineral dust acts as cloud condensation nuclei (CCN) as well as ice nuclei (IN) and contributes significantly to the global annual particle emissions by mass. Every year, huge amounts of Saharan mineral dust is transported westward across the Atlantic Ocean into the Caribbean. During transport, the chemical and microphysical properties of the mineral dust may be modified thereby changing the CCN properties of the dust aerosol.

During the Saharan Aerosol Long-range Transport and Aerosol-Cloud-Interaction Experiment (SALTRACE: http://www.pa.op.dlr.de/saltrace) in June/July 2013, CCN measurements were performed on the DLR Falcon research aircraft with a dual column Cloud Condensation Nuclei Counter (CCNC) first at Cape Verde then at the Caribbean. The CCNC provides information about concentration of CCN at two different supersaturations at the same time. For SALTRACE, one column of the CCNC was set to 0.2% supersaturation, whereas the second column was operated in scanning mode at different supersaturations between 0.1 and 0.5%. Additional CCN measurements by a ground-based single column CCNC were performed at Ragged Point, Barbados.

During SALTRACE five mineral dust outbreaks were investigated. The CCN measurements in the Caribbean showed three layers with different CCN characteristics during these outbreaks. In the upper part (2.5 to 4.5 km) of the Saharan Air Layer (SAL) in the Caribbean the aerosol properties are similar to the ones measured in the dust layer over Cape Verde and the CCNC measurements show low CCN concentrations and little activated fraction. In contrast, a higher variability was detected in the lower part (0.7 to 2.5 km) of the SAL. Within this layer a much higher CCN activation leads to a larger CCN concentration and cumulus clouds were frequently observed. Below 0.7 km also a high variability in activated fraction was observed, but CCN concentration was lower than in the lower part of the SAL.

We will present results of the airborne CCN measurements including the vertical distribution of CCN properties. Beyond that we assess CCN properties observed in the Caribbean and discuss potential causes for the observed three layer structure.