Geophysical Research Abstracts, Vol. 9, 00445, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00445
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Collision efficiency measurements of droplets and aerosols with sizes relevant to the atmosphere

S. Gedamke, O. Stetzer, U. Lohmann

ETH-Zurich, Institute for Atmospheric and Climate Science, Zurich, Switzerland
(stefan.gedamke@env.ethz.ch / Phone: +41-44-63-27426)

The collision efficiency between atmospheric relevant sized water droplets and different sized aerosol particles were measured in a newly developed flow chamber. The newly developed chamber has a parallel plate geometry with a laminar flow profile inside. Aerosol-loaded air is brought into the chamber on one side from the top and forced in a 90° angle downwards into the chamber in two streams. Additionally, droplets are injected from the top of the chamber between the two aerosol-loaded air streams. The aerosols and the droplets are merged in the first quarter of the chamber and continue moving downwards. The chamber length is variable (200-800 mm) and the cross-section is 100x10 mm. The droplets are collected at the bottom with a modified cup-impactor while the particles are collected on a filter. The typical flow-rate through the chamber is 1 l/min. Aerosol sizes from 50 nm up to 5 μm are analyzed with droplets diameters between 35 and 70 μm. The aerosol particles consist of Cesiumchloride and Cesiumiodide. Cesium has the highest sensitivity since the droplet are analysed for the captured mass of aerosol particles with Inductively-Coupled - Plasma Mass-Spectroscopy. As particle- and droplet-sizes and -numbers are known it is possible to calculate the collision efficiency. The experiments are currently accomplished and will be presented at the conference.