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# First Measurement Results of the Fast Ice Nucleus Counter FINCH

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Among the cloud-active aerosols, the tropospheric ice nuclei (IN) play a special role in the formation of precipitation considering the Bergeron-Findeisen process (Pruppacher, 1997). The number concentration of the IN, the temperature and the ice-super saturation to activate the IN are considered as key information to the understanding of ice formation in clouds. In the past, comparative measurements with different instruments showed large differences of deposition mode freezing IN concentrations (Vali, 1975). This is the result of different measuring methods and sampling strategies. Furthermore long measurement periods are needed to obtain a sufficient statistic. In such periods considerable concentration fluctuations occur. These points complicate the interpretation of measured data.

Therefore a Fast Ice Nuclei Counter FINCH (Fast Ice Nucleus Chamber) was developed at the Institute for Atmosphere and Environment Frankfurt together with the Institute for Atmospheric Physics in Mainz. IN particles are activated within the chamber at certain ice super-saturation and temperature by mixing three gas flows, a warm moist, a cold dry, and an aerosol flow. After activation the particles will grow while they pass a processing chamber.

With a new developed optical detector it is possible to distinguish between supercooled droplets and ice particles (result of activated IN) to obtain the number concentration of IN. This is done in two ways: 1) by measuring the depolarisation ratio P44/P11 and 2) by measuring the asymmetry ratio of forward scattering at 30° scattering angle.

FINCH is called a fast IN-Counter because of the high flow rate of the aerosol sample of 5-10 l/min. With number concentrations from 10 IN/l this leads to a measuring

period of 1-2 minutes, sufficient to obtain good statistics. The presentation will show measurements of the deliquescence curves for different aerosol samples (e.g. caolinite, AgI, desert dust etc.) and furthermore the first results of the field measurements at the Jungfraujoch (CLACE 2007).

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