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***In-situ Ice Crystal Properties at High-Latitudes***

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Ice fog and light snow occur often at high latitudes. These weather conditions affect visibility and influence the local radiative energy budget. Prediction of the associated hydrometeors using models is difficult because of limited knowledge of the microphysical properties at the small size ranges involved. For better characterization, imaging of ice particles can complement other in-situ measurements collected more routinely. A newly built imaging instrument, has been used to collect measurements during FRAM (Fog Remote Sensing and Modeling) project, which took place during Winter of 2010-2011 in Yellowknife, NWT, Canada. Results from this study are presented.

Thin cirrus clouds at high latitudes are often composed of small ice particles not larger than 100  $\mu\text{m}$ . Cirrus microphysical properties, such as particle size distributions (PSD) and particle shapes, determine their net radiative effect and are needed for calibrating or validating passive and active remote sensors. A series of balloon-borne in-situ measurements that is carried out at a high-latitude location, Kiruna in northern Sweden targets upper tropospheric, cold cirrus clouds to better characterize their properties. First results from these ongoing measurements show that ice particles in these clouds are predominantly very small, with a median size of measured particles of around 50  $\mu\text{m}$ . Particles are collected and then imaged inside the balloon-borne instrument. The particle shape can be recognised on the images, and size, area, and area ratio of particles determined. Derived PSDs, extinction coefficients, ice water contents, and effective diameter are shown.

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**Thursday, 10 December 2015, 3:30 PM**

Refreshments 3:15 PM

NCAR-Foothills Laboratory

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