

Name of research institute or organization:

**Institute for Meteorology and Climate Research,
Karlsruhe Institute of Technology**

Title of project:

Measurement of ice particles in mixed phase clouds during CLACE 2013 at Jungfraujoch

Project leader and team:

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Project description:

These measurements were conducted as part of our contribution to the CLACE 2013 campaign which took place in January and February 2013 at Jungfraujoch. For our measurements we deployed three instruments; the Small Ice Detector (SID3), the Particle Habit and Polar Scattering (PHIPS) instrument and the Particle Phase Discriminator (PPD2-K). SID3 and PHIPS were deployed to probe the cloud directly at the Sphinx terrace. Therefore they were mounted on a platform which adjusted itself to the wind direction. An aspiration system ensured a permanent flow of cloud particles through the instruments. Furthermore, PPD2-K was mounted as part of the novel ice selective inlet (ISI) which was developed in collaboration at the Paul Scherrer Institute (PSI), Switzerland.

Figure 1 depicts a case study on the comparison of the number of small ice particles measured by the SID3 and the number of ice residuals determined by the Ice-CVI run by Stephan Mertes, Tropos, Germany. The correlation between the rising number of small ice particles measured by SID3 and the increasing number of ice residuals is obvious from the graph. Through further analysis of the data we want to check whether there is a similar correlation between the SID3 measurements and the PPD2-K measurements conducted as part of the ISI.

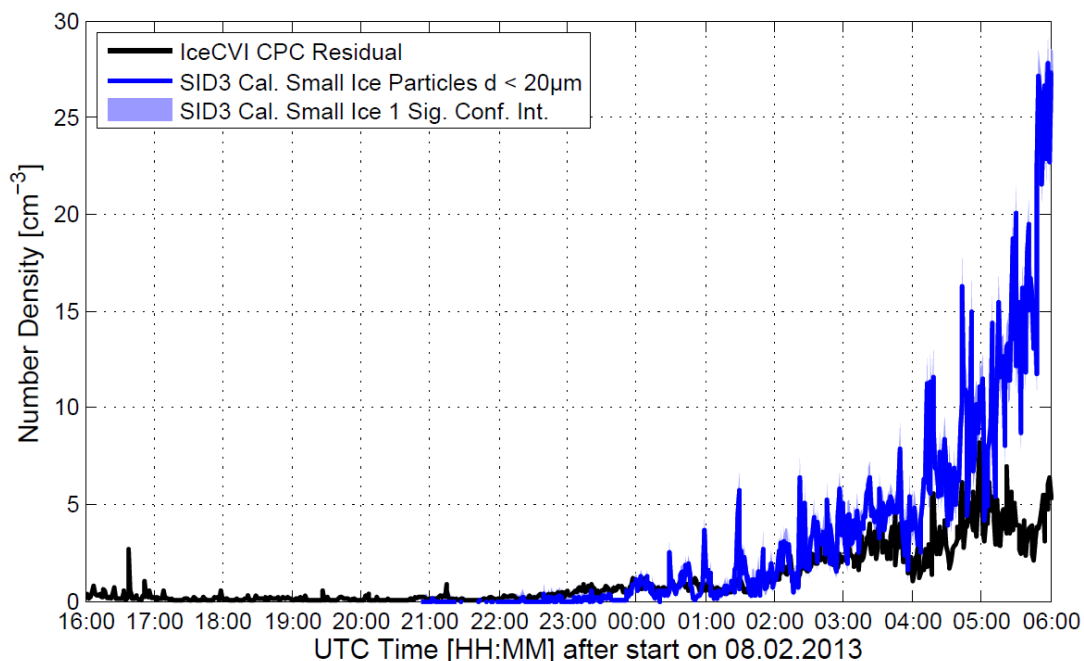


Figure 1. Comparison of the IceCVI residual density and the SID3 calculated small ice particle number.

The PHIPS instrument takes microscopic images of cloud particles which allow the determination of the ice particle habit. These images were analyzed within the Bachelor thesis of Annika Lauber. Figure 2 shows a comparison of four different case studies on ice particle habit. The correlation between ice particle habit and temperature is in very good agreement to observations which are collected in the Furakawa Diagramm [Libbrecht, 2005].

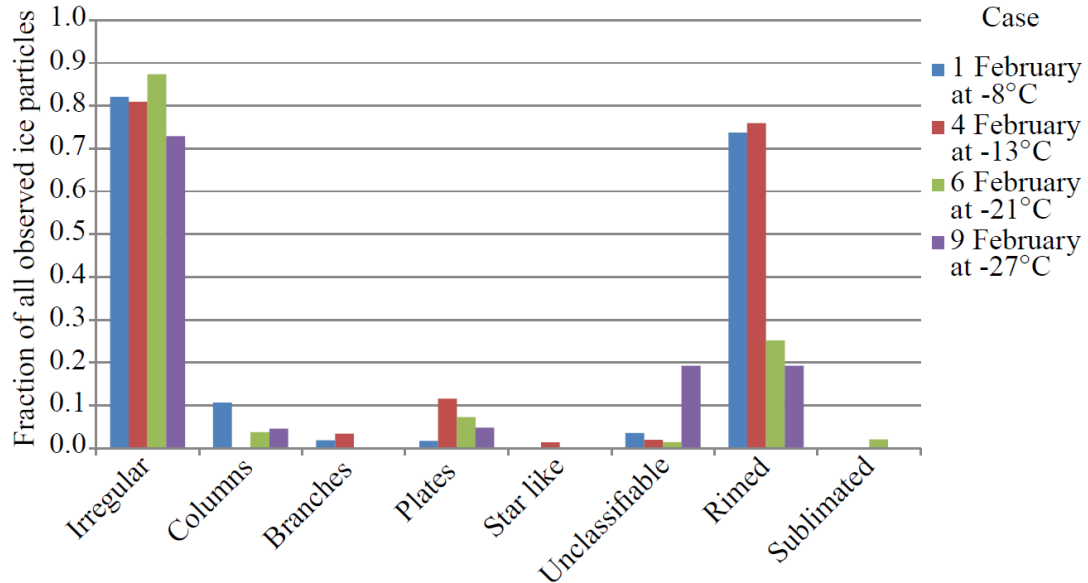


Figure 2. Overview on ice particle habits and properties during four investigated cases.

Key words:

Cloud microphysics, small ice particles, ice particle habits

Collaborating partners/networks:

Paul Scherrer Institute, Tropos

Scientific publications and public outreach 2013:

Conference papers

Vochezer, P., M. Schnaiter, P. Kupiszewski, E. Weingartner, Investigating mixed phase cloud ice particles, INUIT Summer School, Braunfels, Germany, 2013.

Vochezer, P., M. Schnaiter, A. Abdelmonem, P. Kupiszewski, E. Weingartner, T. Leisner, In situ characterization of cloud ice particles at the AIDA cloud chamber and Jungfrauoch, Davos Atmosphere and Cryosphere Assembly, Davos, Switzerland, 2013.

Theses

Lauber, A., Statistical analysis of ice particle habits observed in clouds at the High Altitude Research Station Jungfrauoch, Bachelor Thesis, Karlsruhe Institute of Technology (KIT), November, 2013.

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