

Name of research institute or organization:

Institute for Atmospheric and Climate Science, ETH Zurich

Title of project:

Measurements of ambient ice nuclei (IN) with the new instrument PINC

Project leader and team:

Dr. Olaf Stetzer, Dr. Berko Sierau, and Prof. Ulrike Lohmann, project leaders
Cédric Chou, Peter Amsler, and Johanna Spiegel

Project description:

The cloud physics group at ETH Zurich has developed various instruments to measure ice nucleation and the properties of ice nuclei, ambient aerosols, and ice crystals. The new Portable Ice Nucleus Counter (PINC) has been deployed for the first time on the Jungfraujoch station in January 2008. Since then the instrument has been improved significantly (background counts and usability) and could be used for routine measurements during two campaigns in 2009. In one campaign, two other instruments from our group accompanied PINC to measure sizes and shapes of in-cloud droplets and ice crystals.

One goal of the PINC data analysis was to find correlations between ice nuclei (IN) concentrations and other aerosol properties. Since mineral dust is known to be a good IN we caught a few “Saharan Dust Events” as defined by PSI to test correlations especially during these phases. We measured average concentrations of IN of about 10/liter on the Jungfraujoch. During Saharan Dust events these concentrations could be as high as 300/liter. The best correlation was found between IN and coarse-mode particles greater than 1 μm as detected by the PSI optical particle counter.

Key words:

ice nuclei, heterogeneous nucleation, aerosol particles, clouds, ice crystals

Collaborating partners/networks:

Ernest Weingartner, Martin Gysel, PSI

Scientific publications and public outreach 2009:

Peer-reviewed papers

Two papers with measurements of PINC and HOLIMO at Jungfraujoch are in preparation. One has been submitted recently:

Peter Amsler, Olaf Stetzer, Johanna Katharina Spiegel, and Ulrike Lohmann: “Characterization of a free tropospheric mixed phase cloud at the high alpine research station Jungfraujoch in Switzerland”, submitted to: *Journal of Atmospheric Science*

Conference papers

Cédric Chou, Olaf Stetzer, and Ulrike Lohmann: “Measurements of Ice Nuclei Properties at the High Alpine Station Jungfraujoch”, IAMAS Conference Montreal, Canada, 19. - 29. July 2009.

Theses

PhD thesis of Peter Amsler: *Digital in-line Holographic Microscope for Ice Crystals*, 2009, ETH Zurich.

Address:

Institute for Atmospheric and Climate Science
ETH Zurich
Universitätsstrasse 16, CHN O16.3
CH-8092 Zürich

Contacts:

Olaf Stetzer
Tel.: +41 44 633 6161
Fax: +41 44 633 1058
e-mail: olaf.stetzer@env.ethz.ch
URL: <http://www.iac.ethz.ch/>