Name of research institute or organization:

Institute for Atmospheric and Climate Science, ETH Zürich

Title of project:

Assessment of high altitude aerosol and cloud characteristics, cirrus climatology

Project leader and team:

Prof. Thomas Peter, project leader
Dr. Ulrich Krieger, senior scientist
Uwe Weers, Engineer
Marco Vecellio, Technician

Project description:

Our project aims at gaining a better understanding on the properties of cirrus clouds, their formation and lifetime.

We operate a Leosphere ALS 450 Lidar in combination with a Vaisala Cl31 ceilometer to measure attenuated backscatter in two polarizations at 355 nm. Using these data we retrieve extinction and optical density of cirrus clouds and analyze those using meteorological parameters from the COSMO-2 weather model analysis.

Over the past years, we did collect data for about 5500 hours at the Jungfraujoch site which makes our climatology one of the largest data sets for Lidar cirrus observations available.

In 2015 we finalized a publication evaluating the radiative properties of mid-latitude cirrus clouds. This publication (Kienast et al.) is currently under review. A case study (Kienast et al. 2015) which was described in the 2014 report was published in 2015.

As a side project we started searching our Lidar data set for the occurrence of dust plumes (master thesis of Yandong Tong) and compare these with ground based observations at the Jungfraujoch.

Unfortunately, the Lidar had a series of failures after the end of February 2015 with a number of repair attempts not yielding stable operation. Hence we brought the system back to Zurich at the end of 2015 for a fundamental revision.

Key words:

Lidar, cirrus, climatology

Collaborating partners/networks:

Paul Scherrer Institut

Scientific publications and public outreach 2015:

Refereed journal articles and their internet access

Kienast-Sjögren, E., A.K. Miltenberger, B.P. Luo, T. Peter, Sensitivities of Lagrangian modelling of mid-latitude cirrus clouds to trajectory data quality, Atmos. Chem. Phys., **15**, 7429-7447, doi: 10.5194/acp-15-7429-2015, 2015. http://www.atmos-chem-phys.net/15/7429/2015/

Kienast-Sjögren, E., C. Rolf, P. Seifert, U.K. Krieger, B.P. Luo, M. Krämer, and T. Peter, Radiative properties of mid-latitude cirrus clouds derived by automatic evaluation of lidar measurements, under review in Atmos. Chem. Phys.

Theses

Kienast-Sjögren, E., Mid-latitude cirrus properties derived from lidar measurements, PhD thesis ETH 22492, ETH Zürich, 2015.

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