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# PHIPS-HALO Stereo Imaging Data

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## 1.0 Data Set Overview

This data set presents the single particle measurements performed by PHIPS-HALO. Data set gives overviews of the stereo micrographs captured by the imager part of PHIPS-HALO.

Data was collected during the SOCRATES field project onboard the NSF/NCAR HIAPER aircraft.

Area of Interest:

Maximum (North) Latitude: -30.00, Minimum (South) Latitude: -70.00

Minimum (West) Longitude: 130.00, Maximum (East) Longitude: 180.00

Time of Interest:

2018/01/19 04:16:00 UTC to 2018/02/24 08:28:00 UTC

[https://www.eol.ucar.edu/field\\_projects/socrates](https://www.eol.ucar.edu/field_projects/socrates)

## 2.0 Instrument Description

PHIPS-HALO is a single particle cloud probe developed at Karlsruhe Institute of Technology, Germany. The probe is installed underwing in a standard PMS canister. The instrument takes stereo micrographs of single cloud particles entering its sensing area under an angular viewing distance of 120°. For the same particles angular light scattering functions are measured from 18° forward direction to 170° backward direction with 8° angular resolution. Technical details can be found in:

Schnaiter, M., Järvinen, E., Abdelmonem, A., Leisner, T., "PHIPS-HALO: the airborne particle habit imaging and polar scattering probe – Part 2: Characterization and first results.", *Atmospheric Measurement Techniques*, 11, 341-357, 2018, doi:10.5194/amt-11-341-2018

Abdelmonem, A., Järvinen, E., Duft, D., Hirst, E., Vogt, S., Leisner, T., and Schnaiter, M., "PHIPS-HALO: the airborne Particle Habit Imaging and Polar Scattering probe – Part 1: Design and operation.", *Atmospheric Measurement Techniques*, 9, 3131-3144, 2016, doi:10.5194/amt-9-3131-2016

## 3.0 Data Collection and Processing

From the individual stereo micrographs a set of particle properties like equivalent diameter and area are deduced as described in:

Schön, R., M. Schnaiter, Z. Ulanowski, C. Schmitt, S. Benz, O. Möhler, S. Vogt, R. Wagner, U. Schurath, "Particle habit imaging using incoherent light: a first step toward a novel instrument for cloud microphysics", *Journal of Atmospheric and Oceanic Technology*, 28, 493–512, 2011

Stereo micrographs are acquired with a maximum repetition rate of 3 Hz.

In addition to the micrographs angular light scattering functions are measured and digitised with 11 bit resolution.

Single particle light scattering functions are acquired with a maximum repetition rate of 3.5 Hz without data loss.

#### **4.0 Data Format**

Data is provide as overviews of the stereo micrographs captured by the imager part of PHIPS. Image panels are given for camera C1 and camera C2 of the stereo imager. The panels are designated as e.g. "aircraft.PHIPS.20180119043240.C1.png", with the upper time limit (UTC) of the overview period given in the file name. The starting time of the image data acquisition is given in the top left corner in the panels. Each image in the panels are designated by the image time stamp (UTC) and the image number. The file format of the panels is png.

#### **5.0 Data Remarks**

No data for research flight RF01 due to a failure of the imaging laser.