

ARISTO 2016 Report PHIPS-HALO

Intention when you applied for ARISTO

The aircraft probe PHIPS-HALO is a development of the KIT and ARISTO 2016 offered for the instrument a vital testing platform, where the instrument was tested and operated under real flight conditions. In ARISTO 2016 we mainly wanted to test a new instrument software that is under development. This software was developed so that automatic assignment of scattering data to the imaging data is possible. A key question was, how the software would perform under flight conditions. Second goal was to develop a new data product for detection of ice particles from the scattering data and to determine the ice fraction. The final motivation for participation to ARISTO was to validate the performance of the PHIPS-HALO probe onboard NCAR/C-130 so that future deployment of PHIPS-HALO in NSF-funded missions would be possible.

What had you hoped to accomplish

Ideally, the new instrument software should perform at high particle rates so that the automatic assignment of the scattering data to the images is working and no data would be lost. Furthermore, the new software was expected to run stable throughout the whole flight, in longest case 8 hours. The instrument was hoped to perform well under the flight conditions onboard the C-130 so that vibrations would not be an issue and that the connection to the probe would survive throughout the flight. For testing the software it was hoped to fly in clouds of all phases with a slight preference to mixed-phase clouds.

Whether or not it was accomplished

The instrument performed well onboard the C-130. We were able to maintain the connection to the probe and communicate with it under all flight conditions. Also the integration to the C-130 worked without any problems and was well prepared from the RAF site.

The ARISTO test flights offered valuable information for the performance of the new instrument software. Although the count rates in clouds occasionally resulted in software performance problems, we were able to confirm that the automatic assignment worked. We were able to find the cause for the software performance problems and this is going to be fixed for the next campaign.

Flights in mixed-phase clouds will be used in development of the new data product. This work is still ongoing and we are not yet able to tell, if the mixed-phase cloud data from ARISTO 2016 is enough to complete the development of this new data product.