Observation Campaigns

Campaigns

Completed campaigns

- NARVAL1 Tropics (or NARVAL1 South)
- NARVAL2 [1)]

Over the past few years, the High Altitude and Long Range Research Aircraft (HALO) has been an integral part of various observational campaigns of the Max Planck Institute for Meteorology as well as the University of Hamburg. HALO, being a modified Gulfstream G550, has a long endurance (more than 10 flight hours), a long range (about 8000 km), and a high ceiling (15.5 km). Read more about the aircraft and the HALO consortium here. The two NARVAL campaigns were primarily for validating the various remote sensing measurements on board the aircraft with satellite measurements, and perform an intercomparison between them. NARVAL2 also had an additional objective of measuring area-averaged estimates of vertical motion by launching dropsondes in a circular pattern. Following the success of this method (Bony & Stevens, 2019), the upcoming EUREC^{4}A campaign is planned as an excursion to understand shallow cumulus clouds in their trade-wind environments.

- EUREC⁴A

(more information can be found on the campaigns webpage https://eureca4.eu)

Ongoing campaigns

- FESSTVaL: measuring submesoscale (O(1-10) km) spatio-temporal variability during summertime in the mid-latitude (Germany)

(more information can be found on the campaigns webpage https://fesstval.de/en/)

Planned campaigns

- BOW-TIE: **B**eobachtung von **O**zean und **W**olken - Das **T**rans **I**TCZ **E**xperiment

Key question: „how processes on the scale of convective storms, and their interaction with the ocean, impact the properties of the Atlantic Intertropical Convergence Zone“

Why a ship campaign? For detailed analysis of the storm scale processes and the surrounding dynamic and thermodynamic conditions.

Measurement strategy: Obtain vertically resolved cross-sections of the ITCZ from the upper ocean through the atmosphere.

- TOOC: Tropical Oceans & Organized Convection

TOOC (pronounced ”to see” and which stands for Tropical Oceans and Organized Convection), is a

proposed pair of field studies in regions of deep convection over the tropical Atlantic. TOOC aims to: * test the importance of mechanisms for convective self-organization, including processes of cyclogenesis; * test representations of ice-microphysical processes and their effects on the tropical heat budget; * quantify the importance of convective organization on air-sea interaction; * provide the data to evaluate the representation of these processes in a new generation of global ocean-eddy and storm-resolving climate models; * calibrate and validate satellite remote sensing.

Data Access

HALO Data

Unified Dataset

There is a unified dataset, developed by Konow et al (2018), available for all NARVAL campaigns and the NAWDEX campaign together, which integrates the data from the HAMP instruments along with the dropsonde data, over a uniform grid of 30 m resolution in the vertical. The dataset also includes auxiliary data from BAHAMAS. Along with the data, quick looks for all flights have been uploaded to the CERA database as auxiliary data. These datasets are available at:

1. NARVAL1 South
2. NARVAL1 North
3. NARVAL2
4. NAWDEX

Liquid water path

Using the microwave measurements on board HALO, in combination with the cloud radar and lidar measurements, Jacob et al (2019) have calculated the liquid water path (LWP) and rain water path (RWP), using artificial neural network techniques for the NARVAL1 South and NARVAL2 campaigns. The dataset also includes integrated water vapor (IWV), along with auxiliary data from the radar and lidar. These are also available through the CERA database at :

1. NARVAL1 South
2. NARVAL2

WALES Data

All WALES data is available through the DLR Institute for Atmospheric Physics in the HALO database at:
German Aerospace Center (2016).

specMACS Data

Although the data is not published yet, data from specMACS is available at the MACS-LMU server.

Please contact Tobias Kölling (LMU) regarding any queries about these data.

1. NARVAL2
2. NAWDEX
3. Cloud Mask product for NARVAL2
4. EUREC4A

SMART Data

Available from the HALO database here

[1)]

HALO has also been part of two other campaigns where MPI and UHH were participants, namely:
1. NARVAL1 Extra-tropics (North), which was an extension of the NARVAL1 South campaign and took place in the ocean area surrounded by Greenland, Iceland and the British Isles.
2. NAWDEX, which took place in 2016 and in the region similar to that of NARVAL1 North