Deliverable 1.3.2: Integrated data collection of Arctic parameters received via ground-based remote sensing and airborne platforms for submission to WP5

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WP 1 Ground-based component for SLCFs

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Collection of airborne in-situ as well as ground-based remote sensing data for submission to WP5

A number of campaigns have been performed in Arctic and Antarctic over the last decades. However, vertical measurements of atmospheric pollutants, such as airborne data of gases or aerosol particles are still rare from that regions. To fulfil this deliverable, a teaser for UAV measurements of aerosols in Ny-Ålesund (Svalbard) was prepared and the data will be submitted within the next 3 months. The title of this dataset is “Investigating the small-scale vertical and horizontal variability of the atmospheric boundary layer aerosol using unmanned aerial systems (UAS)”. More than 50 measurement flights were performed from April 25 until May 25, 2018 in using two different types of unmanned aerial systems (UAS) equipped with meteorological and aerosol sensors.

During the Expedition PS106.1 and PS106.2, (Bremerhaven – Longyearbyen – Tromsö) a Cloudnet station has been operated on board RV Polarstern. The research area of PS106.1 was mostly stationary on ice floe north of Svalbard while data from PS106.2 was mostly obtained during an ice-cruise northeast of Svalbard. The main instruments included were a vertically stabilized cloud radar MIRA-35, a multiwavelength aerosol Raman polarization lidar PollyXT, and a microwave radiometer HATPRO, accompanied by a total-sky-imager, solar and terrestrial broadband radiation sensors. The datasets focus on the classification of Arctic aerosols and clouds, their microphysical properties, vertical distribution, and radiative effects. The teaser was submitted to iCUPE under the title ”Continuous vertical observation of aerosol and cloud properties during the Polarstern cruises PS 106.1 and PS106.2 using a CLOUDNET station” and data are available under www.pangea.de.

A very comprehensive database including many arctic data is available under www.pangea.de. This includes many ship-based campaigns in the Arctic Ocean, but also continuous data from the AWIPEV station in Ny-Ålesund as well as data from aircraft campaigns.

A tethered balloon is operated regularly in Ny-Ålesund by Italian researcher from different institutions. Their data would provide also a valuable contribution to iCUPE to be compared with model results or remote sensing measurements and might be available also in the future within iCUPE.

Thus, the topic of data collection is ongoing over the durations of the project.