

Beginning in the fall of 2014, NASA sponsored two airborne field campaigns, collectively called Polar Winds, designed to fly the Doppler Aerosol WiNd (DAWN) lidar and other instruments to take airborne wind measurements of the Arctic atmosphere, specifically over and off the coasts of Greenland during Oct-Nov 2014 and May 2015. In particular, Polar Winds conducted a series of science experiments focusing on the measurement and analyses of lower tropospheric winds and aerosols associated with coastal katabatic flows, barrier winds, the Greenland Tip Jet, boundary layer circulations such as rolls and OLEs (Organized Large Eddies), and near surface winds over open water, transitional ice zones and the Greenland Ice Cap

The focus instrument for the wind measurements taken over the Arctic during Polar Winds was the DAWN airborne wind lidar (Kavaya et al., 2014). At a wavelength of 2.05 microns and at 250 mJ per pulse, DAWN is the most powerful airborne Doppler Wind Lidar available today for airborne missions. DAWN has previously been flown on the NASA DC-8 during the 2010 Genesis and Rapid Intensification Processes (GRIP) campaign (Kavaya et al., 2011) and on the NASA C-12 for wind field characterization off the coast of Virginia. In addition to DAWN, Polar Winds utilized the High Definition Sounding System (HDSS) dropsonde delivery system developed by Yankee Environmental Services (Black et al., 2014) to drop almost 100 dropsondes during Campaign to obtain additional high-resolution vertical wind profiles during most missions. These dropsondes also provided needed calibration/validation for the much newer DAWN measurements.

Polar Winds Campaign 1 was based in Kangerlussuaq, Greenland and flew DAWN on board the NASA King Air UC-12B during Oct-Nov 2014 while Campaign 2 was based in Keflavik, Iceland and utilized the NASA DC-8 aircraft to fly DAWN and Dropsondes over the Arctic in May 2015. In total, twenty-four individual missions with over 80 hours of research flights were flown in the Arctic region near Greenland and Iceland during Polar Winds.

1. REFERENCES

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