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Comparison of PSC Measurements from CALIPSO and the M-55 Geophysica During the 2010 RECONCILE Field Campaign

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The European Union has implemented the 4-year research project RECONCILE (reconciliation of essential process parameters for an enhanced predictability of Arctic stratospheric ozone loss and its climate interactions) for more comprehensive and detailed investigations of key processes governing Arctic ozone depletion. One key component of RECONCILE is an intensive field campaign of coordinated aircraft, balloon, and ground-based measurements related to polar stratospheric clouds (PSCs) and ozone chemistry that was conducted in the Arctic during January-March 2010. The aircraft campaign was based in Kiruna, Sweden, where the M-55 Geophysica high-altitude research aircraft conducted a series of science flights carrying a full suite of in situ and remote sensors. Five flights during the first phase of the RECONCILE aircraft campaign (17-28 January 2010) were specifically targeted at PSC exploration. PSCs were also observed over the Arctic during this period by the spaceborne lidar onboard the CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) satellite, which has been operating nearly continuously since mid-June 2006. This paper will present comparisons of CALIPSO 532-nm PSC backscatter measurements with values derived from in situ particle observations by the COPAS (Condensation Particle counting System) and FSSP (Forward Scattering Spectrometer Probe) instruments flown on the Geophysica. The focus of the comparison will be on the flight of 20 January, when a 30-minute Geophysica flight segment was executed directly along the CALIPSO ground track.