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The Winter Arctic Stratosphere in 2009/2010 – Overview, Gravity Wave Activity and Predictability of Sudden Stratospheric Warmings

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The evolution of the Arctic winter 2009/2010, especially the stratospheric conditions during the two phases of the RECONCILE (Reconciliation of Essential Process Parameters for an Enhanced Predictability of Arctic Stratospheric Ozone Loss and its Climate Interactions, an EU-FP7 project, see: https://www.fp7-reconcile.eu) field campaign will be discussed. The operational products of the Integrated Forecast System (IFS) of the European Centre for Medium-Range Weather Forecasts (ECMWF) are analysed to provide meteorological fields characterising the vortex evolution. The characteristics of the polar vortex before, during and after the sudden stratospheric warming end of January 2010 will be emphasized. Climatological questions like: Was this winter an exceptional cold one compared to previous winters? and others will be answered by analysing the ERA-Interimdata set (ERA-Interim is the latest ECMWF global atmospheric reanalysis of the period 1989 to present. Information on the resolution, the data assimilation system, the observations and the boundary forcing of the ECMWF-Interim reanalysis project can be found under http://www.ecmwf.int/research/era/do/get/era-interim). The communication presents a detailed analysis of the gravity wave activity in relation to the CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations, see http://www-calipso.larc.nasa.gov/) observations of mountain-wave induced polar stratospheric clouds over Greenland. A new aspect is the analysis of the 50 members of the ECMWF's ensemble prediction system to predict the sudden stratospheric warming events begin of December 2009 and end of January 2010.