



Observations of Chemical and Dynamical Processes in the Polar Stratosphere by the Odin Satellite: the 2009-2010 Northern Hemisphere Winter Compared to Earlier Years

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The Odin satellite provides global profile measurements of key constituents relevant to stratospheric chemistry and dynamics such as ozone (O_3), nitrous oxide (N_2O), chlorine monoxide (ClO), nitric acid (HNO_3), nitrogen dioxide (NO_2), and water vapour (H_2O) on a regular bases since 2001.

Scientific results are presented with focus on measurements taken at high northern latitudes in the polar winter stratosphere of the winter 2009-2010. The Odin/SMR measurements of nitrous oxide, water vapour, chlorine monoxide, nitric acid, and ozone allow for example to study the chemical and dynamical evolution and variability of the Arctic vortex during winter and spring by providing information on chlorine activation, de-nitrification, subsidence of vortex air, and on ozone loss.

Results for the northern hemisphere 2009-2010 winter will be put in relationship to (climatological) results for the longer Odin measurement period from 2001 to 2010, providing information on the inter-annual chemical and dynamical variability. The Arctic winter stratosphere is characterised by "cold" winters with relatively well confined vortices and considerable chlorine activation and chemical ozone loss (e.g. 2002-2003, 2004-2005, 2006-2007) as well as by "warm" winters with high variability of transport and exchange of air during and after mid-winter major stratospheric warming events, between high and low latitudes as well as between stratosphere and mesosphere (e.g. 2003-2004, 2005-2006, 2008-2009).

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