

Assimilation of Odin/SMR data into a high resolution Eulerian transport model

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Brief Abstract:

Ozone observations made by the Sub Millimeter Radiometer (SMR) on the Odin satellite have been assimilated into a wind driven Eulerian transport model using a sequential Kalman-filtering approach. By sampling air masses at consecutive times it has thus been possible to separate chemical ozone depletion from large scale transport processes. Quantitative estimates of polar ozone decay rates have been made for the northern winters of 2002/2003 and 2003/2004 and for the southern winters of 2003 and 2004.

Using the transport model it is possible to keep track of the temperatures, levels of chlorine activation and numbers of sunlit hours that occur in air masses between consecutive satellite observations. Thus, the observations made by Odin/SMR have been compared to theoretical models for heterogeneous polar ozone depletion as well as to depletion rates obtained from other measurement campaigns.