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# Vertical redistribution of $NO_y$ in the polar stratosphere in winter 2009/2010

Jens-Uwe Grooß (1), Rolf Müller (1), Hans Schlager (2), C. Michael Volk (3), Peter Bernath (4,5), Chris Boone (5), and Kaley A. Walker (6)

(1) Forschungszentrum Jülich, Institut für Energie- und Klimaforschung - Stratosphäre (IEK-7), Germany (j.-u.grooss@fz-juelich.de), (2) Institut für Physik der Atmosphäre, Deutsches Zentrum fuer Luft- und Raumfahrt DLR, Oberpfaffenhofen, Germany, (3) Fachbereich Mathematik und Naturwissenschaften, Atmosphärenphysik, Bergische Universität Wuppertal, Germany, (4) Department of Chemistry, University of York, UK, (5) Department of Chemistry, University of Waterloo, Canada, (6) Department of Physics, University of Toronto, Canada

Polar stratospheric temperatures in winter 2009/2010 were low enough that even ice particles were found to be present. Large particles with a major content of reactive nitrogen ($NO_y$) have been observed in about 20 km altitude, most likely composed of solid nitric acid trihydrate (NAT). The sedimentation of these particles yields a vertical redistribution of $NO_y$ with consequences for chemical ozone depletion.

Simulations with the Chemical Lagrangian Model of the Stratophere (CLaMS) show this effect. The results of the simulations are confirmed by in-situ observations of $NO_y$ (SIOUX) and $N_2O$ (HAGAR) taken onboard the Geophysica aircraft for the flight altitudes up to 20 km. Above 20 km, the $NO_y$ redistribution is compared with $NO_y$ derived from satellite observations by the ACE-FTS experiment.

The comparison of the simulation and observations will be shown, especially regarding the sensitivity to significant parameters as the NAT nucleation rate. The impact of denitrification on ozone loss will be determined.