



Denitrification in the polar vortices of both hemispheres

J.-U. Groß, R. Walter, G. Günther, P. Konopka, and R. Müller

ICG I, Forschungszentrum Jülich, Germany (j.-u.grooss@fz-juelich.de)

We present simulations with the 3-dimensional version of the Chemical Lagrangian Model of the Stratosphere (CLaMS) for the Arctic winter 2004/2005 and the Antarctic winter 2003. The simulations aim to reproduce chemical ozone loss in the polar stratospheres.

Denitrification caused by sedimentation of HNO_3 -containing (NAT) particles is important in this context as it causes a prolonged period of chlorine activation and thus more ozone depletion at the end of the polar winter. Within CLaMS, denitrification is simulated using a Lagrangian sedimentation scheme that follows individual NAT particles.

Previous studies have shown that the use of a globally constant NAT nucleation rate at locations that are below NAT equilibrium temperature yields realistic denitrification. We show that when using a globally uniform NAT nucleation rate, only denitrification in the Northern hemisphere can be properly described. In contrast, in the Southern hemisphere, cannot be described in this way. This conclusion was derived by comparing the CLaMS results to various data sets including MIPAS-ENVISAT and MLS-AURA data.