IMPORTANCE OF INTERACTIVE DETAILED POLAR STRATOSPHERIC CLOUD FORMATION IN A TWO-DIMENSIONAL CHEMICAL TRANSPORT MODELLING OF THE STRATOSPHERE.

D. Fonteyn[1], N. Larsen[2]

[1] BISA, Ringlaan 3, B-1180 BRUSSEL, BELGIUM
(e-mail:dominiq@aero.oma.be)
[2] DMI, COPENHAGEN, DENMARK

We coupled a highly detailed microphysical polar stratospheric cloud (PSC) model with a 2-D chemical transport model extending from to ground up to the stratopause in an isentropic framework. Four microphysical processes are considered when considering the evolution of an ensemble of PSC particles: nucleation, growth or shrink of the particles by condensation or evaporation of vapor, and sedimentation. At each location the PSC model takes as input the ambient air state variables: temperature, pressure, water vapor and nitric acid vapor. Results are presented of the simulated PSC type 1 (NAT) and PSC type 2 (ice) characteristics and climatology using the 2-D model temperature climatology. Through heterogeneous processing on the calculated PSCs, the polar winter and spring chemical composition is discussed. Using these results as reference case, the sensitivity of the PSC climatology and atmospheric chemical composition to sedimentation of PSC particles, cross polar vortex boundary transport, polar temperature evolution, and chemical perturbations is discussed.