Geophysical Research Abstracts,
Vol. 11, EGU2009-6001, 2009
EGU General Assembly 2009

Interpreting CALIPSO PSC observations using a 3D detailed microphysical model

F. Daerden (1), M.C. Pitts (2), L.R. Poole (3), and N. Larsen (4)

(1) BIRA-IASB, Brussels, Belgium (F.Daerden@aeronomie.be), (2) NASA Langley Research Center, Hampton, VA, USA, (3) Science Systems and Applications, Inc., Hampton, VA, USA, (4) Danish Meteorological Institute DMI, Copenhagen, Denmark

The CALIOP (Cloud-Aerosol LIdar with Orthogonal Polarization) lidar system onboard the CALIPSO spacecraft, part of the A-train configuration, has been providing observations of Polar Stratospheric Clouds (PSCs) nearly continuously since mid-June 2006 at unsurpassed spatio-temporal scale and resolution [Pitts et al, 2007]. CALIOP data are collected in three receiver channels - 532-nm parallel-polarized backscatter, 532-nm perpendicular-polarized backscatter, and 1064-nm total backscatter. A recently developed second generation PSC detection algorithm allows for the separation of PSCs into composition classes.

Interpretation of CALIPSO PSC retrievals is now assisted by large-scale model simulations using a detailed microphysical model [Larsen, 2000] coupled online to a 3D CTM [Daerden et al, 2007]. This unique approach allows for the integrated and simultaneous description of meteorology, stratospheric (photo)chemistry, PSC formation, heterogeneous chemistry and chlorine activation, denitrification and ozone depletion. The PSC model describes 5 types of particles (sulfate aerosols, STS, NAT, water ice and SAT). The sulfate aerosols are initialized by pre-winter background conditions and the simulations are done on a hemispheric scale for an entire polar winter season. The model calculates the optical properties of the cloud ensembles for direct comparison with the data measured by CALIOP. First results of this comparison will be presented.