Geophysical Research Abstracts,
Vol. 11, EGU2009-10196-2, 2009
EGU General Assembly 2009

Modelling of charged stratospheric ice particles.

J. K. Nielsen and N. Larsen

Danish Meteorological Institute, Middle Atmosphere Research Division, Copenhagen, Denmark (jkn@dmi.dk)

In situ observations of ice particles in the lower tropical stratosphere have enforced the idea that deep convective tropical systems are moistening the stratosphere through occasional injections of tropospheric air masses. A few measurements performed with the Wyoming backscatter sonde in Bauru (2004) and Niamey (2006) have also raised interesting questions about composition and thermodynamics of the observed particle layers in the lowest stratosphere: Careful analysis of available precipitation radar data and wind fields recorded prior to these soundings reveals that ice particles with radii around 1 micron must have stayed stable in the subsaturated lower stratosphere for several hours at least. It is proposed that electric charge attached to ice particles could account for their stability. In this contribution we include the charge effects in a microphysical cirrus model, the MPC spectral model, in an attempt to simulate these measurements. On one side the charge-theory explains the stability of small ice particles, but on the other hand it is hard to explain how the charged ice clouds can stay stable as macroscopic objects.