



A 3D-CTM with detailed online PSC microphysics: Heterogeneous chemistry and comparison with CALIPSO satellite observations during Antarctic winters

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A 3-D Chemical Transport Model (CTM), with full stratospheric chemistry and driven by the ECMWF temperature and wind fields, is coupled to the PSC microphysical model PSCBox. This interactively describes the formation and evolution of four types of PSC particles (STS, SAT, NAT, and ice) through relevant microphysical processes. The number density and composition of each type of particles are computed for a binned size distribution. As a result, the calculation of surface area densities is accurately performed, of which the computation of the heterogeneous reaction constants takes advantage.

The explicit computation of the particle size distributions allows obtaining the same optical properties as those measured by CALIPSO. Hence, the evolution of PSC coverage and composition will be studied and compared to the CALIPSO observations during Antarctic winters. The relationship between the presence of PSCs and the heterogeneous chemistry will also be investigated. In particular, two issues will be considered: (i) how the ozone depletion is related to the PSC coverage, and (ii) how each PSC particle type contributes to the chlorine activation.