Geophysical Research Abstracts, Vol. 9, 00997, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00997

A numerical investigation of effects of ice crystal habits on aggregation process

T. Hashino and G. J. Tripoli

Department of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison, Wisconsin, USA (hashino@wisc.edu / Phone: +1 608-262-8954)

This paper discusses effects of ice crystal habits on evolution of size distributions through aggregation process. A quasi-stochastic model with prediction of particle property has been developed for a 3D Eulerian dynamics framework. This model can evolve axis lengths of ice crystals and circumscribing volume of aggregates without use of categorization of ice particles. In a box model setup, the aggregation simulation was tested for five habits: plates, columnar crystals, dendrites, side plans, and bullet rosettes, starting from pristine crystals. The results show good agreements with empirical relationships of mass, maximum dimension, and density. The simulations with aggregation efficiency of 1 still show differences in the evolution of size distribution due to differences in swiping volume. A simple physically-based efficiency was also tested. More analysis and validation will be given and discussed in the presentation.