Séminaire 1 mars 2013 11h / Seminar march 1st 2013 11h

Conférencier/Lecturer: Jason Milbrandt (RPN)

Sujet/Subject: Improving the Representation of Rimed Ice:
The Prediction of Graupel Density in the Microphysics and Why it Matters

Présentation/Presentation: Anglais / English

Lieu/Room: Salle des vents (Dorval)

wiki: https://wiki.cmc.ec.gc.ca/wiki/RPN_Seminars

iweb: http://web-mrb.cmc.ec.gc.ca/mrb/rpn/SEM/
web: http://collaboration.cmc.ec.gc.ca/science/rpn/SEM/index.php

Abstract

The representation of ice-phase hydrometeors in atmospheric models has evolved considerably over the past 40 years. In microphysics parameterizations, ice was originally represented by a single category with one prognostic variable for the total bulk mass. More and more detail was added, with an increasing number of-categories and increasing prognostic information related to their respective size distributions. To a great extent, the increased detail has successfully achieved the desired goals of improving the overall simulation of ice-phase cloud microphysical processes and reducing the number of tuneable parameters. However, current microphysics schemes still suffer from the fact that the wide spectrum of frozen particles in nature is artificially partitioned into representative categories. A new prognostic variable has been added to the Milbrandt-Yau two-moment scheme which allows for the prediction of the density of graupel (heavily rimed ice). In this sense, this development is yet another increase in prognostic detail for a particular category. However, this new technique of modeling graupel allows for the simulation of a realistically broad range of densities and terminal fall speeds, from that of lightly rimed crystals to high-density hail, all within a single hydrometeor category. The new approach is thus part of a paradigm shift towards improved prediction of particle characteristics, rather than increased numbers of categories.
An overview of the method will be presented along with model results that illustrate the behaviour of the new scheme and the overall improvement of the simulation of rimed ice and ultimately the surface precipitation.