

The RAL Seminar Series



NCAR

A New Bulk Microphysical Parameterization in MM5 & WRF and what's so bad with the old scheme anyway?

by

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Foothills Lab, Building 2, Room 1001,
3:00 p.m.*

A new bulk microphysical parameterization (BMP) has been developed completely from scratch for MM5 and WRF. The new scheme incorporates a large number of improvements to both physical processes and computer coding. Unlike any other BMP, the assumed snow size distribution depends on both ice water content and temperature and is represented by a sum of two gamma distributions matching recent observations by Field et al. (2005). In general, the new snow treatment reduces ice supersaturation at high altitudes (low temperatures) and within deep glaciated clouds but enhances supercooled liquid water in shallow, relatively warm clouds. This aspect, combined with a rain size distribution intended to mimic both classical and non-classical precipitation formation mechanisms, result in improved forecasts of freezing drizzle and aircraft icing.

Another unique feature of the new scheme is the use of a single hydrometeor category to simulate both graupel and hail. Initial simulations of convective squall lines indicate improved representation of leading convection with trailing stratiform whereas many BMPs show intense bulls-eye convection and lack the trailing stratiform. Among a number of physics improvements is the proper treatment of hydrometeor collision/ collection. A summary of the new scheme will be presented along with initial simulation results.