

P30 Impact of microphysical consistency between sub-grid and grid-resolved cloud parameterizations on QPF and simulated radar reflectivity

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A current trend in microphysics parameterization schemes is toward increasing complexity, including the prediction of number concentrations in addition to the traditional mass variables such as hydrometeor mixing ratios. At the same time, the emergence of scale-aware cumulus parameterizations makes these schemes more applicable on “gray” scales (~1-10 km horizontal resolution). When physical processes such as sub-grid clouds contribute to a change in the mass of a variable for which number concentration is predicted by the microphysics, a corresponding change in this second moment must also be computed. This requires an assumption to be made regarding the particle drop size distribution for the change in mass due to the sub-grid cloud parameterization.

In this presentation, we explore the sensitivity of the WRF model to the size distribution assumptions applied to the sub-grid component of the number concentration for two different cases.