

Interactive comment on “Influence of microphysical schemes on atmospheric water in the Weather Research and Forecasting model” by F. Cossu and K. Hocke

Anonymous Referee #1

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The authors nicely designed a group of experiments to test how different microphysical parameterization schemes influence the precipitation and the distributions of hydrometeors and water vapor for the mid-latitude summer conditions in WRF-ARW model. The manuscript is well written. The results are interesting and well presented. I recommend for publication in GMDD with some concerns, which I hope the authors can address in their revision.

1. P4577, line18-22. I think the model level above ground and the surface conditions are mainly responsible for the variation of the evaporation rate. Since the surface temperature is prescribed, the surface saturated mixing ratio follows the surface temperature. As a result, the water vapor mixing ratio at lowest model level dominated the

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surface evaporation rate. When the atmosphere is wet in the first a few days (Fig.4), the surface evaporation rate is low (Fig.7), when the atmosphere is drier and drier the surface evaporation rate goes up. That's why when water vapor is exponentially decreased, the surface evaporation rate has an exponential increase.

2. P4568. Is 500m too coarse for the lowest model level?

3. It will be interesting to see the profiles of the Temperature (T) and water vapor (Qv) tendencies from different parts, e.g., dynamical advection and mixing, microphysics, radiation, and PBL vertical mixing. How different microphysics schemes influence other model parts to balance T and Qv in the atmosphere.

4. Are RRTMG radiation schemes more suitable for the simulations in this case?

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