

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-322

Anonymous Referee #2

Referee comment on "Impacts of combined microphysical and land-surface uncertainties on convective clouds and precipitation in different weather regimes" by Christian Barthlott et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-322-RC1>, 2022

As the authors stated, model uncertainties exist in many physical schemes and dynamics, including initial/boundary conditions (IC/BCs). There can be numerous combinations of such uncertainty sources. Can the authors explain why it is essential to consider the combination of soil moisture and cloud microphysics compared to other possible combinations?

A similar question: there are many uncertainties in cloud microphysical parameterizations. How are these factors considered in this study? Can the authors justify why they focused only on uncertainties in N_{CCN} and CDS parameters? Also, the authors mentioned many uncertainties related to aerosol-cloud interactions (lines 45-76). Can these uncertainties be represented by perturbing the N_{CCN}?

The discussion on the normalized standard deviation is too brief and does not provide much scientific insight.

I would like to see a more quantitative comparison of spreads from the three sensitivity factors (i.e., soil moisture, CCN, and shape factor).