

Author's response 2

We would like to thank the reviewer for reviewing our manuscript and for the positive feedback. Please find below our replies highlighted in blue.

Reviewer 2:

This manuscript highlights the value of polarimetric radar observations for evaluating cloud microphysical parameterizations within numerical weather prediction models. Cloud microphysical parameterizations are statistical representations of our understanding of sub grid scale processes, and as the authors highlight, the creation and validation of these parameterizations are limited by observations. In this study, polarimetric radar observations, together with inline reflectivity diagnostics (CRSIM), are used to understand the partitioning of the cloud fields into stratiform and convective parts across five cloud microphysical parameterizations. The authors show that these five cloud microphysical parameterizations are in somewhat close agreement with the distribution of total precipitation across the study area. However, the convection cloud fraction varies greatly across parameterizations, suggesting the partitioning into convective/stratiform is problematic. Additionally, they attribute that the rain drop size distributions within the microphysics parameterizations are a source of the differences in rain particle sizes within convective/stratiform regions.

This manuscript is well written and generally easy to follow. This framework for microphysics evaluation within NWP/GCMs provides a great tool for future cloud microphysics parameterization development and evaluation.

Minor Comments:

For both figures 5 and 6, panels a-b (upper-row) are labeled with 5500m, whereas panels c-d (lower-low) are labeled with 1500m. However, the figure caption has upper-low labeled with 1500m and lower-row labeled with 5500m. The Figure and references in the text appear to be correct, but the caption is not.

Fixed.