The paper presents a nice way to partially isolate the affects of cloud droplet distribution shape on condensation/evaporation by comparing condensation/evaporation rates in a bulk model to a bin model. Statistics are produced for average condensation/evaporation rate binned in terms of distribution properties such as average drop distribution diameter. It is shown that when comparing bulk to bin condensation/evaporation rates, removing the effect of of the distribution shape will generally produce better comparision, expect when evaporation mass fraction is high. While the method is useful more discussion on how to apply the method to improve bulk models is needed.

General Comments:
You discuss comparing process rates between bin and bulk in order to improve bulk schemes. So how do you use your analysis to improve bulk schemes? It seems like the parameter space of various values of number concentration, distribution shape, and average cloud droplet size is so large that this study, although useful, would have trouble providing direct improvement to bulk models? Is this correct or is there a good way to use bin models to inform bulk models for condensation/evaporation?

Why not use values from the curves from Fig.1 when choosing simulations to run?

Line 95: You state “the lack of a prognosed shape parameter for the cloud droplet size distribution in the bulk scheme is often the primary source of difference between the two schemes.” Why only used a fixed shape parameter in the bulk simulations? Why not diagnose a value? Would diagnosing a value provide better results? How would diagnosing a value change your results? Perhaps diagnosing the shape parameter would leave to better agreement between bulk and bin when evaporation fraction is high.

Specific Comments:
Abstract
Line 16: I don’t agree that the statistics are novel. Maybe replace with “statistically”

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Line 35: The shape is sometimes fixed as well
Line 44: Probably can remove discussion on ice as it it irrelevant to the paper
Line 64: What parameter are you talking about?
Line 107: Remove this line.
Line 109: PDF is already defined
Equations 2 and 3 need periods at the end of the sentence
Line 143: What do you mean by this? Do you have a larger range of bins and thus more statistics?
Line 146: How deep are the clouds in the simulations? A grid of 3.5km high seems far to shallow.
Line 196: extra comma
Line 291: Certainly clouds exist between 99-101% RH, and certainly signatures of the drop distribution properties should should up between these RHs. Why not just include the analysis? Also, what percentage of the grid exists between these humidities?
Line 234: Extra “)”

Could you possible get rid of Table 2 and incorporate the standard deviation data into the figures?
Line 249: Evaporation seems to tend towards bulk in Fig. 3A
Line 251: Is the long tail in the condensation or evaporation?
Line 289: Briefly describe the method used to fit the bin distributions.
Line 301: What percentage of the data had best-fit shape parameters less than 1? Did it occur frequently?
Correcting the data seems to make the orange line in Fig. 3C worse. Why?
Line 351: What does an NRMSE of 2 mean?
Figure 4. Needs to be explained better in the text. Is it showing that approximately 80% of the cloudy grid points have an NRSME<0.6? Why is 0.6 considered appropriate?
Line 395: It can account for some changing drop distribution properties, but not large changes to the shape parameter that may occur when evaporation rates are high. Is this large change in distribution shape during evaporation that the bin model can capture the reason for the difference in Fig. 5A?
Maybe move Fig. 4C and 4D to their own figure?
Line 443: But what does that high evaporation fraction do to the bin distribution?
Conclusion 1: What assumptions were made for the aerosol distribution in the bin model? Was it initially assumed to be a gamma distribution? If so, then it is no surprise that using a gamma distribution would be a good bulk assumption compared with bin.
Conclusion 2: (Line 468) You didn't show that sub-time stepping is important. Remove this sentence.
Line 473: Specify the conditions that this applies for: Low evaporation fraction, humidites >101%, etc.
Remove the talk about radiation and ice in the Appendix