[Response to the reviews]

I commend the authors for their comprehensive revisions that have acted to greatly improve the manuscript and have highlighted the value of the sound science performed, presenting a foundation for further work to follow on from what was done here. Below are a few technical corrections and one more point (#2) that needs to be clarified.

: We appreciate the reviewer's valuable comments. We have thoroughly addressed all the comments raised by the reviewer in the revised manuscript. The detailed responses are noted below.

1) When discussing the Best Number, need to use a different variable to represent it because "X" is already being used to represent hydrometeor species. Maybe a Greek Chi would work.

: In response to the reviewer's comment, we have replaced "X" with "χ" to represent the Best Number.

2) The new quantitative statements on Lines 346-348 and 352-356 appear to be erroneous in some way. In lines 346-348, you state that surface graupel increases in WDM6_PD relative to WDM6_PD (by 124%), but then go on to stay that domain-averaged graupel amount is 0.64 mm in WDM6_FD and 0.51 mm in WDM6_PD, which would indicate a decrease in graupel for WDM6_PD relative to WDM6_FD.

Similarly, on lines 352-356, you state that surface snow decreases significantly (by 92%) in WDM6_PD, but then state that domain-averaged snow amount is 0.77 mm in WDM6_FD and 0.84 mm in WDM6_PD, which would indicate an increase; then for graupel, you say it increases by 121% in WDM6_PD, but then say that domain-averaged graupel is 0.21 mm in WDM6_FD and 0.18 mm in WDM6_PD, which would indicate a decrease. So something is wrong here unless I'm misunderstanding the interpretation.

: Thank you for the thoughtful comment. In the previous version, we recorded the swapped values for graupel and snow amounts between the two experiments (WDM6_PD and WDM6_FD). We have modified the following sentences to correct the discrepancies.

-Line 346: "Specifically, the total surface snow is reduced by 93% (domain-averaged snow amount is 0.75 mm in WDM6_FD and 0.80 mm in WDM6_PD), and surface graupel shows an increase of 124% (domain-averaged graupel amount is 0.64 mm in WDM6_FD and 0.51 mm in WDM6_PD) in WDM6_PD compared to WDM6_FD." → "Specifically, the total surface snow is reduced by 93% (domain-averaged snow amount is 0.80 mm in WDM6_FD and 0.75 mm in WDM6_PD), and surface graupel shows an increase of 124% (domain-averaged graupel amount is 0.51 mm in WDM6_FD and 0.64 mm in WDM6_PD) in WDM6_PD compared to WDM6_FD."

-Line 352: "Surface snow decreases significantly by 92% in WDM6_PD (domain-averaged snow amount is 0.77 mm in WDM6_FD and 0.84 mm in WDM6_PD), compared to WDM6_FD, while the surface graupel increases by 121 % (domain-averaged graupel amount is 0.21 mm in WDM6_FD and 0.18 mm in. WDM6_PD) (Figs. 8g and h)." → "Surface snow decreases significantly by 92% in WDM6_PD (domain-averaged snow amount is 0.84 mm in WDM6_FD and 0.77 mm in WDM6_PD), compared to WDM6_FD, while the surface graupel increases by 121 % (domain-averaged graupel amount is 0.18 mm in WDM6_FD and 0.21 mm in. WDM6_PD) (Figs. 8g and h)."

3) Line 451: I think "hights" should be "highlights"

: Revised accordingly.

4) Line 57: Picky semantics again, but P3 predicts the rime mass fraction and rime density, but rime volume is prognostic, not predicted.

: In response to the reviewer's comment, we have modified the corresponding sentence as below:

-Line 57: "Morrison and Milbrandt (2015) later developed the Predicted Particle Properties (P3) bulk micro physics scheme that predicts the rime mass fraction~~, rime volume,~~ and rime density for a single generic ice-phase category."