

Review of “The Fifth International Workshop on Ice Nucleation phase 2 (FIN-02): Laboratory intercomparison of ice nucleation measurements” by DeMott et al.

In the DeMott et al. FIN-02 manuscript the authors collate and present data from a large scale instrument intercomparison effort. The work presented here attempts to focus on a certain subset of measurements and/or measurement conditions to present a summary of the level of agreement to the community. This manuscript is important for a number of reasons, but primarily I believe it is of benefit in that it presents an assessment of measurement variability between instruments in highly idealized experimental systems. Thus, one would expect the range of results presented here to represent a baseline of uncertainty between measurements in the field.

In such an endeavor of course many choices are made and here overall I think that the authors have made good choices, and the manuscript is well written and tells a cohesive story. I do find some small areas where I think the reading is confusing and some clarifications could be made. Those and other editorial comments are listed in an itemized fashion below.

As a general comment, I do think the Summary and Conclusion section could have expanded the “do’s and don’t’s” a bit. The authorship represents a large number of those active in the field and I do not think it would be giving away any secrets if they discussed a bit what failed, or was discovered not to have worked during the campaign. Also, they do make a few suggestions for the future, but I am left wondering if the community came no closer to formulating certain experiments that could be done side-by-side anytime two or more instruments are co-sampling. In other words, does any suggested minimum protocol emerge to assess the agreement between instruments? Perhaps a complete picture and set of recommendations emerging from FIN-02 will be detailed in another publication?

In general, if reviewer comments are addressed I recommend this paper for publication without a need for further review.

Itemized Editorial Comments (page/line):

- 1/38 item b only has a departmental affiliation it is missing an institutional affiliation.
- 6/16-18 What comes after the comma at: “...Fig. 1, and why...” does not make sense as written. The why results are given at certain RH is not noted? I think the clause needs to be rewritten.
- 7/28 I recommend you change “in this manuscript” to ‘presented here’.
- 7/30 This first sentence of the section is long and awkward. I recommend it is changed. It can be split into 2 sentences.
- 8/4-5 thermodynamic paths not path
- 8/10 would limit particle loading
- 8/18 activation temperatures instead of “temperatures of activation”. Also, add ‘and referenced’ after “...are listed”. I was looking for the instrument references as I was reading and did not realize they were in the table until getting there. Finally, I suggest striking “Details on all of” rather begin the next sentence with “The specific ...”
- 9/1 I recommend “besides” is changed to ‘in addition to’
- 9/3-5 The sentence beginning “ In this regard...” is awkward and should be rephrased. Is it the recommendation of the 2007 workshop, or previous workshops and it was followed in 2007?

- 9/5 recommend change to ‘Schematic thermodynamic paths of the AIDA chamber experiments are shown by the’
- 9/20 suggest ‘....cloud regime (i.e., 0 to -36 C). Thus they provide....’
- 10/12 suggest wording is changed to ‘However, in some experiments larger particles were present ...’
- 10/13 should “some cases” be ‘those cases’
- 12/2 I suggest that when $n_{s,geo}(T)$ is defined the units [m^{-2}] are included.
- 13/6 suggest wording is changed to ‘A striking feature of these results is the general correspondence between all methods ...’
- 13/14 suggest ‘The greatest discrepancies’ replace “Greatest discrepancies...”
- 13/15 “Supplemental” should be ‘Supplement’
- 13/19 suggest wording is changed to ‘...understanding of what RH_w value might....’
- 13/23 The final sentence of the paragraph ending, “... Fig. 4 is encouraging” is oddly placed in a results section. I think it is extraneous.
- 14/15 replace “at the same time” with ‘simultaneously’
- 14/27 replace “Comparison” with ‘A comparison’
- 15/17-20 This is a very long and confusing sentence, I suggest rewording.
- 15/29 Should it not be CMU-CS?
- 15/33 awkward wording. The source of variations question?
- 22/1 “provide the decision” is awkwardly worded.
- Figure 3 caption – The caption fails to define what the differently colored points indicate. Furthermore, I suggest the 2 light blue shadings be somehow differentiated. If my understanding is correct then I think the 2nd sentence would read, “An initial impinger and filter sampling period is highlighted in light blue 1 and is followed by an APC refill and subsequent sampling period (light blue 2). In any case I think the caption should be carefully reread and reworded for clarity.
- Figure 4 caption – Suggestions: (1) strike ”on some points” (2) replace “buried within” with ‘subsumed by’ (3) add ‘...errors) or alternatively the binned...’
- Figure 7 caption – bring “in this case” to beginning of sentence
- Figure 8 may be better presented vertically for such a 2 column journal? Perhaps the authors intend to stretch this over the entire page? Currently the text seems somewhat small. (also Figures 9-11).

General figure comments: Can the chosen color schemes for the instruments remain consistent between those figures that represent APC and AIDA data? Also, I think making many of the figures box plots with at least the major tick marks represented on the minor axis would be more reader friendly.