Baranizadeh et al review

General Comments

The comments on the initial review have mostly been well addressed (see specific comments for details) and the improved growth rate calculations have greatly enhanced the value of this analysis. The presentation of results and analysis is much improved. The analysis now allows substantive conclusions to be made, which the paper does not yet do. In addition, there is a puzzling result of the growth rates at larger sizes providing better calculated nucleation rate correlation with measurements than those at the smaller, relevant sizes. This should be looked into before the analysis is considered complete.

Comments

Response to comment on line 221 – how was this identified as a transport artifact?

Line 32 – dispute that 'actual mechanisms' of nucleation remain unknown, experiments such as CLOUD have shown then 'actual mechanisms' of many types of nucleation in great detail.

Line 40 – even with sub-2nm cut-offs Js still have to be approximated – yes but explain, not all readers will be familiar with this

Fig 1 – agreement is consistently better with GR7-10nm, this seems odd. How do the GR3-10 and GR7-20 compare – there must be a systematic different, or an extra uncertainty in the GR3-10 to explain this, or something wrong the J equation that means the more removed 7-20nm GR is compensating for an error – needs to be evaluated

Lines 237-240 - quantify 'most' and 'some' and 'fairly-good agreement' with statistics

Line 283 'should hold as good as in Hyytiala' – not really accurate, if GRs are faster in Puijo, then the GR uncertainties relating to time dependence on change in coag sink will affect J less. Technical note 'as well as in Hyytiala' instead of 'as good as in Hyytiala'

Line 300-303: this sentence is not very clear on the actual cause of the poor time evolution agreement. The effect of the 3 listed factors on the time evolution needs to be explained better.

Lines 309-310: Statement about Asmi's reported J7s at Pallas requires a clearer link to the work in this paper if it is to be included.

Lines 311-313: Agree about the challenges faced in calculating J3 from J7, however the paper would be of much more use if a quantitative statement about the utility of the presented method and analysis were made. This study can and should be used to make a quantitative evaluation of the utility of this method to calculate J3. Either it is or is not worthwhile, and a number can be put on the accuracy of the method based on the data presented here. The author may wish to consider putting this in the broader context of things e.g. when put into climate models, what is

the general sensitivity in CCN number concentration or even CN3 or 10 to a factor 2 change in J?

Purely Technical Comments

Line 21 were -> was