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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Indirect radiative forcing by ion-mediated nucleation of aerosol" *by* F. Yu et al.

Anonymous Referee #1

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As far as I know, the new CLOUD results are not published yet. However, in the Kirkby et al., (2011) Nature paper, none of the experiments (except for the one at 248 K) can reproduce the ambient nucleation rates (even when ammonia is added) (see figure 5 and the surrounding discussion). No organics were added to any of these experiments. Furthermore, the ambient nucleation rates in this figure extend to rates that greatly exceed the BL ion-pair formation rates.

Regarding the boreal field campaigns, there is a difference between variations in organics at a single site causing variations in nucleation rates versus organics enhancing nucleation rates. In the Kirkby 2011 paper, the enhancements due to NH3 saturate at around 100 ppt. If the organics involved in nucleation are always high enough in concentration that their effect on nucleation is saturated, any variation in organics will not

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make a difference. This does not mean that the organics are not having a large effect on the nucleation rates.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 17347, 2012.