

***Interactive comment on* “New particle formation in air mass transported between two measurement sites in Northern Finland” by M. Komppula et al.**

Anonymous Referee #1

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Nucleation of atmospheric nanoparticles is key to understanding a range of atmospheric phenomena such as cloud dynamics, the role of forests on climate, and ocean-atmosphere interactions. This paper is the first to compare nucleation measurements from two sites strategically located to catch air masses passing over both sites. Since the sites are relatively clean, therefore containing few particles and a correspondingly low condensational sink, nucleation is frequently observed. By comparing the observations at the two sites, the authors draw some interesting conclusions about the role of oceanic and terrestrial biogenic emissions on nucleation. The observations complement those of this group and that of others around the globe who have examined nucleation in these environments.

Interactive
Comment

One point that does not receive sufficient attention in the manuscript is nucleation at night. On pages 12 and 13, these nucleation events are mentioned and there is also mention of oxidation of the organic precursors by OH and NO₃ left over from the day time. It is not clear if these gas phase compounds were measured or posited, but I think they are posited. Is there really enough OH and NO₃ to oxidize enough organic to cause these events? The authors should look at the CS during these events to estimate the approximate residence time of the condensable organics during sunset to midnight, when the events stop. Is it possible for the condensable organic concentration to increase during these hours? Instead, could it be that the nucleation is caused by increased relative humidity as the atmosphere cools during these hours? There are many possibilities. The community is struggling to understand nucleation and the hypotheses center around photochemical pathways because that is the easiest for us to understand and nucleation events are mostly observed during the day. But those night time events sure make me wonder if we are on the right track. At least they deserve more attention. We too observe a lot of nucleation events at night and we too have no idea what's going on.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 11929, 2005.

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