

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

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General points

The paper reports on data obtained in 2002-2003 following a previous report on data from 2000-2001 (Komppula et al 2003b), with some analysis of all the data, and specific analyses of events at both sites on two days. Difficulties in understanding Finnish forest nucleation events arise because nucleation, probably involving sulphuric acid, may be largely unrelated to the subsequent aerosol growth from organics which are still poorly specified. Accumulated data sets of this nature and their statistical analysis can therefore be useful in determining event frequency and extent and the origins of the condensing species. The present analysis goes some way in this direction in distin-

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guishing seasonal variation, the difference between eastern and western air masses, and the spatial correlation between observations at places 250 km apart. However, I believe that there is much more potential information which could be obtained from further statistical analyses of the details of the observed data. Here are some suggestions:

1. There is very large variability in the data (see Stdev in Table 2) and this needs much better specification in terms of fluctuations. All such measurements made at fixed points in space over a time period have fluctuations resulting from spatial non-uniformity in the passing aerosol (see measurements elsewhere in Finland). These fluctuations need characterisation (i.e. time variability which clearly shows up in the Pallas measurements of Case 2 shown in Figure 8).
2. Do these fluctuations persist over travel for 250 km? Analyses of correlations between time series at Pallas and Värriö for same day events would be interesting.
3. Some of the quantities shown in Tables 1 and 2 and in Figure 3 are precise and others are time averages which may make the presented data harder to understand, e.g. CS and J7 in Figure 3. Are there selected data for “uniform” events?

Specific points

1. p3. 2.1 line7. What is a fjeld?
2. p.8 What are class 1 and 2 new particle events?
3. The data in Table 1 and Figure 2 refer to 2002-2003 whereas those in Table 2 are for 2000-2003, including the previous data. Why?

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4. What is the origin of the concentration profiles shown in Figure 7. For condensable species produced by photochemical reactions, their production rate would be expected to peak at midday.
5. p9. 3.13 line 5 from bottom “pattern can be found” delete “not”
6. p13. 3.2.3 line 12. scaling factor larger than 10^{-3} . Does this mean e.g 10^{-2} ?
7. In the simulations shown in Figures 4 and 8 there are clear nucleation peaks, the particles in which are all coagulating with the growing peak after a short time. This behaviour is characteristic of a short nucleation burst and a comment on the desirability of observing it would be worth including. How short are the actual bursts?

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