

## ***Interactive comment on “Atmospheric particle formation events at Värriö measurement station in Finnish Lapland 1998–2002” by H. Vehkamäki et al.***

### **Anonymous Referee #1**

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#### General comments

Overall this is an excellent paper. The paper is a climatology (5 years) of new particle formation events at a remote northern Finland monitoring station. As a summary of observations, this is an excellent paper. The breakdown of events by type (e.g. Figure 3) is very helpful, as is the careful classification into 6 types according to formation and growth patterns. In many ways, it should be a model for future (and possibly retrospective) nucleation climatology papers. However, to the extent that the goal of the work is to shed light on nucleation/growth chemistry/meteorology, the paper does not deliver. The authors suggest that the lack of correlation between growth rate and formation rate is important, as is the difference in timing between Hyytiälä and Värriö events, and the uncoupled SO<sub>2</sub> concentrations and growth rates. Additional modeling and/or analysis will be required to capitalize on these features, and will hopefully be

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provided in a subsequent publication.

#### Scientific questions/issues

The authors make extensive use of event classification, quantification of formation rates ( $\text{cm}^{-3} \text{s}^{-1}$ ), and quantification of growth rates. The numerical conventions used by the Finnish group should be documented to encourage uniformity in these types of calculations by other groups. The methods (if already published) should be cited, or if unpublished, should be included as an Appendix. This is not required, but I think would be useful to the nucleation measurement community.

#### Minor points

1. In the abstract, the sentence beginning (The air masses) is confusing.
2. In the green oval in Figure 3, the numbers 147 and 135 seem to be transposed.

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 3535, 2004.

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