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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Nucleation events in the continental boundary layer: Influence of physical and meteorological parameters" *by* "M. Boy and M. Kulmala"

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Response to specific comments by Referee #2

1. The referee claimed that the existing particle concentration and size distribution should be included in the calculation of the nucleation. As we already argued in the response to referee #1, we tried this in different ways by analysing the data of 1999 but a simple mathematical include in the equation gave no improvement of the nucleation parameter. At the moment we analysing the data of the year 2000 and we work on a new more complex version of the nucleation parameter including also the number concentration of the existing particles and their size distribution as condensational sink.

2. The referee also pointed out that the discussions about the chemical pathways to

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form new particles and especial the correlation to UV-A is not clear enough explained. In the conclusions of the paper we argued that the existence of precursor vapours with absorption cross sections in the UV range could explain the high conformity between the UV daily curve and the changes is the concentration of the smallest detectable particles. We agree that the production of condensing species is likely to be a secondary process concerning the formation of new aerosols but it is on the other hand a key process that the newly formed particles can grow to the detectable size of 3 nm. At the present stage of research nobody knows what process are the steering mechanism for the formation of new particles Ű nucleation or the growth of the nucleated clusters and in the second case our hypothesis about the production of condensing vapours would match.

3. Dimethylamine as explained in the paper were found in analysis of impactor data taken during the BIOFOR campaign with a 100 times higher concentration on event days than on non event days. In this point we have to agree with the referee that it would be correct to say Şthe salt of dimethylamine in the particle phaseŤ.

2. The expression Şmysterious reactionsŤ used in the paper to link new particle formation above a forest site with photochemistry is only a phrase to point out that both the species of vapours and the photochemical reactions responsible for the formation of new aerosols are not well identified till now.

Interactive comment on Atmos. Chem. Phys. Discuss., 1, 239, 2001.