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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evolution of gaseous precursors and meteorological parameters during new particle formation events in the Central European boundary layer" *by* J. Größ et al.

Anonymous Referee #2

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GENERAL COMMENTS

The paper analyses a new and unique data-set: aerosol particle number size distributions (PNSD) measured by Neutral cluster and Air Ion Spectrometer (NAIS) in the diameter range 2-20 nm for 2008-2011 at the research station Melpitz. Data are statistically analyzed by a new method, a convolution of measured PNSDs, and PNSDs observed during strong New Particle Formation (NPF) events. Results are very interesting, clearly presented, concise and well-structured (particularly, the figure 4), and do represent a substantial contribution to the understanding of the NPF.

I recommend publication in ACP, taking due account of the following issues.

SPECIFIC COMMENTS

To help the reader to understand results, my suggestion is to better explain the physical meaning of the convolution integral used here. (Is it similar to a cross-correlation between PNSDs and the selected 27 NPF events?) I also suggest to explain: (i) how results rely on the manual selection of the 27 NPF events, (ii) how the CI thresholds were selected (Table 2), (iii) reasons for the different average time of peak N2-20 for the three classes (Table 2).

To reinforce findings, it would be worth to discuss how dependant results are on the observation site (Melpitz), or conversely how they can be considered as general findings. For instance, a large dependence of NPF events on solar radiation and [SO_2] was found: can this be considered a general finding or a result specific of the Melpitz station (due to local availability of [OH], relative humidity, H_2SO_4 parameterization)? Also, both the condensational sink (as a factor inhibiting NPF events) and [NH_3] (as a precursor of particle nucleation) were found to have a subordinate role : is that a general finding or a finding due to the low road traffic emissions and available agricultural emissions, respectively, at the Melpitz station?

TECHNICAL CORRECTIONS:

- Caption fig.4: is “time series” correct?

- pag.21 line 3: there is an “and” missing after “solar radiation”.

- pag.24 line 1: there is an “and” missing between “radiation” and “[OH]”.

- Figure 4: I would better explain the panel f of [NH3].

- Title: I suggest some modification to clearly reflect the contents of the paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 2305, 2015.