

## ***Interactive comment on “Parameterization of ion-induced nucleation rates based on ambient observations” by T. Nieminen et al.***

### **Anonymous Referee #2**

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### **General comments**

The manuscript presents semi-empirical parameterizations of atmospheric ion-induced particle formation from the gas phase based on observations. Such parameterizations are valuable tools in atmospheric modeling as they relate aerosol nucleation in the models directly to atmospheric observations. At the same time, these parameterizations represent primarily the conditions at the measurement locations, in this case in the continental boundary layer, and need not to apply equally well to other locations in the atmosphere. The manuscript is well written and ready for publication; only a few minor changes to improve the clarity of some passages are suggested.

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## Specific comments

**Page 21698, line 16:** *In principle, these new parameterizations are applicable to all large-scale atmospheric models containing size-resolved aerosol microphysics ...*

The readership will wonder what possible restrictions "in principle" implies.

**Page 21702, line 13:** Some of the symbols in Equation 1 do not match the symbols in the following text (e.g.  $N_2^\pm$ ). It would also be very helpful to explain the individual terms of Equation 1, e.g. by explaining the underlying process for each of them. The term  $\text{CoagS}_2 \times N_{2-3}^\pm$  e.g. may not be readily available to the readership, especially since  $\text{CoagS}_2$  is not explained.

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