

# ***Interactive comment on “Simulating the Influence of Primary Biological Aerosol Particles on Clouds by Heterogeneous Ice Nucleation” by Matthias Hummel et al.***

## **Anonymous Referee #1**

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In the manuscript " Simulating the Influence of Primary Biological Aerosol Particles on Clouds by Heterogeneous Ice Nucleation" the authors used regional atmospheric model COSMO-ART to simulate the heterogeneous ice nucleation by PBAPs during a 1-week case study on a domain covering Europe. This is a topic of much recent interest, however linking airborne cells to atmospheric processes is a difficult task, but one that the current authors try to address. So far, there is still a great deal of uncertainty about the role of PB-INP on ice nucleation in mixed-phase clouds and precipitation on the global average. The authors confirmed again that PBAP have no significant influence on the average state of the cloud ice phase at around -10C. The authors only used 1-week case study but if investigate detail, there are still large uncertainties

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regarding the difficult problem. The authors should mention or cite the similar result by laboratory measurements of rainwater that Lu and collaborators made observation (Lu, et al. 2015. "The diversity and role of biological ice nuclei in rainwater from mountain sites in China." *Aerosol and air quality*, 16: 640–652, 2016 ) thereby illustrating that the representativeness of their conclusions. Generally, I think the topic is great important, the method and data used in this study is sound, the result and conclusions have convinced me, the whole paper is well written.

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