

Schneider et al. present a well-written, succinct manuscript describing results from a full year of INP measurements in a boreal forest region. The study involves assessment of INP biogenic sources in addition to development of a new parameterization for boreal forest INPs. While I find the results and new parameterization valuable, there are a few issues with the manuscript that need to be addressed prior to publication.

While there are indeed very few year-long INP measurements at one location, there are several that report such measurements over an inter-seasonal scale (e.g. Šantl-Temkiv et al., 2019; Stopelli et al., 2015, 2016, and 2017). These studies are worth describing in the introduction. Additionally, it would be useful for the authors to report main findings from previous analogous studies to clearly demonstrate a comparison between those previous and the current results. The introduction is very short and could be beefed up by providing more details on these studies, including their limitations to promote the motivation for the current work.

Šantl-Temkiv, T., Lange, R., Beddows, D., Rauter, U., Pilgaard, S., Dall'Osto, M., Gunde-Cimerman, N., Massling, A., and Wex, H.: Biogenic Sources of Ice Nucleating Particles at the High Arctic Site Villum Research Station, *Environ Sci Technol*, 53, 10580-10590, 10.1021/acs.est.9b00991, 2019.

Stopelli, E., Conen, F., Morris, C. et al. Ice nucleation active particles are efficiently removed by precipitating clouds. *Sci Rep* 5, 16433 (2015). <https://doi.org/10.1038/srep16433>

Stopelli, E., Conen, F., Morris, C. E., Herrmann, E., Henne, S., Steinbacher, M., and Alewell, C.: Predicting abundance and variability of ice nucleating particles in precipitation at the high-altitude observatory Jungfraujoch, *Atmos. Chem. Phys.*, 16, 8341–8351, <https://doi.org/10.5194/acp-16-8341-2016>, 2016.

Stopelli, E., Conen, F., Guilbaud, C., Zopfi, J., Alewell, C., and Morris, C. E.: Ice nucleators, bacterial cells and *Pseudomonas syringae* in precipitation at Jungfraujoch, *Biogeosciences*, 14, 1189–1196, <https://doi.org/10.5194/bg-14-1189-2017>, 2017.

In regard to the very short introduction, perhaps more time could be spent on: (1) the motivation and objectives of the study itself (i.e. SMEAR II) and (2) more details on current parameterizations and modelling efforts for bioaerosols and biological INPs, which often are conflicting and based on a very limited subset of INP observations. This would inherently provide a clear motivator for developing the boreal INP parameterization.

The snow cover information is useful and corroborates the INP concentration cycle, but what about the transition between melt and full growth of vegetation? Showing some sort of vegetation index and/or type information would be useful, particularly for the inter-seasonal transitions.

The methodology on the WIBS and L-ToF-AMS is incredibly limited. Because data from these methods are presented in the paper, the methods should include sufficient descriptions on each instrument, their operating parameters during SMEAR II, and data analysis and interpretation. Even though the L-ToF-AMS is presented in detail in Paramonov et al. (2020), there should still be a brief description of the instrument and data produced here.

Figure 1: It would be useful to show an averaged spectrum per month overlaid on the data in each panel.

Figure 2: The data in panel a are redundant from Figure 1. Suggest omitting and just keeping panel b.

For the “bulge” which is more pronounced in the heated versus unamended INP spectra for the summer samples, why would this be? There should be some discussion as to why this feature is more prominent when the samples were heated, and why this would occur only for samples collected during the summer.

Because n_s is shown earlier on than page 11, the calculation should be provided in the methods.

Like the introduction, the conclusions are brief and somewhat limited. The “bigger picture” should be reiterated for context of the measurements, and perhaps some discussion on what the authors recommend for the next step and future work.