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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Interactions between the atmosphere, cryosphere and ecosystems at northern high latitudes" *by* Michael Boy et al.

Anonymous Referee #1

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The paper addresses important issues, and is a summary of five or more years of research. It is a compendium on aerosol studies in general with special focus on high northern latitudes. Undoubtedly the paper will be of interest to many readers and will serve as a guide to future studies.

As fits my area of expertice I was going to focus my comments about this paper on the cloud active aerosol (CCN and INP) results. As it turns out these are two areas where the paper has little to say.

The CCN instrument is mentioned on page 13 line 15 but no results are reported. Potential CCN sources are discussed in sections about new particle formation and in modeling studies without supporting CCN measurements. Perhaps these will be forthcoming in later publications.

Instrument development for measurements of ice nucleating particles (INPs) is reported on pages 11 and 13, some results are described on page 24.-25. The new instruments represent advances toward INP studies, but the results are not yet in. The sample output from one of the devices in Fig. 7 is evidence that the PINCii instrument is functioning more or less as other similar devices do. NOt much more. Reagarding Fig.7, the upper and lower panels of Fig.7 are not identified, and seem to be the same data in two different formats. Temperature information is missing.

The same text is repeated iin lines 30-34 of page11 and lines 2-5 of page 24.

The laboratory studies described in 4.1.4.1 are important basic studies about water adsorption on surfaces. The link to the rest of the paper is rather abstract and the connection mentioned in lines 23-25 on page 24 is tenouos.

The increases in INP concentrations due to ship exhaust reported at the top of page 25 are interesting. However, it is not known whether the ship emissions would remain ice nucleation active on the longer time scale than the few minutes that was the case in the sampling used.

In all, the status of the CCN and INP data should be given in order to justify mention the instrument developments reported.

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