

Reviewer comments are in italics, our responses in plain font.

This manuscript summarizes new measurements of aerosol size distributions made in summer in pristine British Columbia at two sites 150km apart. The measurements were short in duration and not simultaneous. One site exhibited very frequent new particle formation, often at night, while the other did not. The authors have made the most important datasets on the aerosol size distribution publicly available. They make interesting and useful comparisons of the sites to other places where similar new particle formation is observed or may be expected. The paper motivates more measurements in this very interesting pristine region where conditions are likely not far from pre-industrial. The topic is important, the paper is well written and deserving of prompt publication. I have only a very few minor comments.

Abstract: would it be worth discussing briefly the very interesting diurnal cycle of new particle formation?

We added the following sentences to the Abstract: “In contrast to observations in other temperate/boreal environments, we found that NPF at our sites occurred at nighttime just as frequently as during daytime. Together with the lack of identifiable sources of H₂SO₄ precursor species in the fetch region of our sites, this suggests that nucleation of extremely-low-volatility organics was the predominant NPF mechanism.”

Methods: was the SW radiation shown in Figure 1 measured or from reanalysis?

The SW radiation in Fig. 2a was from reanalysis. This information was added to the Figure caption.

The description of how the nucleation and growth rates presented in Table 1 were calculated might belong better in a short subsection in the Methods, since the Table is given much before the description in section 3.4.6?

We moved the procedures to identify NPF events and to calculate condensation sink, growth rates and formation rates to the Methods section.

I agree with Reviewer 1 that the short duration of the measurements do lead to uncertainties in the interpretation of the data. The authors do point this out already, but more discussion (based on reanalysis, for example) of how representative the weather conditions during the measurement period were of the usual conditions during the summer season would be beneficial. Such a discussion could be used to give more confidence in the results if conditions were representative, or to highlight the uncertainty if they were not.

We thank the reviewer for this suggestion. We compared the meteorological data for June 2019 in our study region with the June averages for 2000 to 2021 using MERRA-2 reanalysis and MODIS data and found no significant bias. We included a discussion on this in Section 3.1, and provide the results in Supplementary Table 1 and Supplementary Figure 1. We are now also including land cover maps (Figs. 1a and 1b) that show that our sites are surrounded by vegetation typically of the region. We added a sentence in the Summary and Conclusions section: “While

the limited duration of our study does place limits on the generalization of our results, the fact that the meteorological conditions during our study were typical of long-term average conditions at this time of year and that the land cover surrounding our sites was typical of the region does support that our results were not subject to bias from unusual weather or vegetation cover.”