

Reviewer Comment

April 24, 2026

The manuscript discusses a new approach to sampling ice-nucleating particles (INPs) onboard of a tethered balloon system (TBS). It is well-written and the first minor corrections only improve an already very good manuscript. Especially the approach of openly sharing the design of the setup (Profiling Upper altitudes For Ice Nucleation, PUFIN) as well as the data, and the approach of offering the sampling system for other scientists are especially commendable. I recommend publication after some minor comments are addressed.

1 Minor comments

1. The setup is mounted below a TBS, which does not offer a way of controlling the direction or the altitude as precisely as an uncrewed aerial vehicle (UAV) might. It is clear that a TBS offers many other advantages, but I do wonder how the PUFIN is oriented in relation to the wind. Do you have a way to make sure that the filter inlets are oriented towards the wind or away from the wind?
2. The blank correction is quite a debated topic within the ice nucleation community. Handling blanks are of course especially important during field campaigns and at new setups. The manuscript describes the averaging of all blanks to take a representative handling blank, which is subsequently subtracted from the aerosol filters (line 246). It would be worthwhile to show the different handling blanks in comparison to the water background to show how they differentiate from the water as well as how large the spread is between the different handling blanks. With the describes setup you get one handling blank filter for each flight, why not use the specific handling blank that was taken during the same flight, instead of an averaged spectra?
3. What is the pressure drop across the filter? This could be mentioned to allow the comparison to ground-based filter setups, especially since the filter material is not very rigid.

2 General comments

1. Generally, I would recommend to use Kelvin instead of degree Celsius for any discussion of relative temperatures, i.e. when discussing rates or differences. For example, in line 227 the rate should be 0.33 K min^{-1} and the uncertainty of the thermocouple $\pm 0.2 \text{ K}$. Similarly, in line 242 when discussing the width of the temperature bins.
2. Sub- and superscript should be upright, when they are made of an abbreviation or a word, i.e. in line 237 drop, suspension, air should all be upright. The same is true for a couple of occurrences in the main text.
3. Sometimes, the $\sim$ symbol is used, when instead the $\approx$ symbol is more appropriate, i.e. in line 296, 332, etc.

2.1 Comments on tables and figures

1. Figure 1: The right side of the figure is cut off (air inlet / blank).

2.2 Technical comments

1. Line 121: Space is missing between number and unit.
2. Line 341: While I understand the use of before in the context of cooling down the droplets, the appropriate term would be "below -15°C ".
3. Lines 347-348: July should not be abbreviated, since the other months are also written in full in the main text.

4. Line 352: "colder temperatures" -> "lower temperatures".
5. Lines 372-378: The exponent of the units is not written as a superscript.
6. Line 391: Do you have any doubt why it would not be able to capture *Pseudomonas Syringae*? Given a high enough concentration, the detection should be straight-forward. I think this sentence could work better in the conclusion, where you can discuss some tests at sites, where biological activity is increased.
7. Line 448: "Lasher et al., 2024" -> "Lacher et al., 2024".