

Review of manuscript “The Arctic Low-Level Mixed-Phase Haze Regime and its Microphysical Differences to Mixed-Phase Clouds”

The primary change of this manuscript includes the adding in of clustering justification of Table 1, and the updates of Figure 2 and Figure 5. These updates 1) connect the previously published journal paper and the current manuscript, 2) improve the visualization of the mixed phase haze microphysics (Fig.5) over the arctic, and 3) show more information of the sonde data distribution. So far the constraint parts are, 1) the explanation of Fig 6, and the scheme figure Fig 11. All the other sections are logically strong and scientifically reasonable in my opinion. I therefore recommend “technical corrections” in this round of review.

1. Figure 11 was designed to visualize the microphysics of MPC and MPH over the open water and sea ice. I wonder if the MIZ should also be shown in this figure between the sea ice and open water considering Fig 9 and 3 have clusters of sea ice, ocean/land and MIZ. This can be a minor change and mainly rely on Fig 9. Also, on the right edge of this figure, there is only MPH existing over the open water. Were the authors implying anything by doing this on purpose? I would appreciate a brief description of this phenomenon and the motivation in the description.
2. This has been mentioned in the previous round before but the authors didn't do an excellent job in modifying to help the readers' interpretation. Confusion arose when I first read this section about Fig 6 and I am confused again in this round of reading. For this figure to really talk about the aerosols and their size distribution, a background introduction of the measurements/physical principle or an intro level discussion of “Particle Fraction” and “Number of Spectra” would be meaningful. I understand the instrumentation section introduced the technical details of ALABAMA but for the readers' convenience, it is important to stress some easy physics here.

I appreciate your add in of “Based on this hygroscopic growth factor and the observed haze droplet sizes ranging from 3 μm to 6 μm , the estimated dry diameters of the solute particles are between 1 μm and 3 μm , calculated from the observed wet diameter range (3–6 μm) divided by the 25th and 75th percentile of the hygroscopic growth factor.” Actually, I personally think the details (e.g. reasons of few particles were analyzed by the ALABAMA above 3 μm) are well explained. But not the physics behind the figure, e.g. “Nevertheless, the domination of SSA at larger particle sizes and the potential of hygroscopic growth for dry NaCl particles to sizes around 5 μm , suggest wet SSA contributing to the observed haze particles.” Please try adjusting the language to be considerate for the readers in your final draft since Figure 6 so far serves as the least well-explained figure in this outstanding quality manuscript.