

After reading the authors' comments, I find the manuscript is worthy of publication.

I agree with the authors' discussion on difficulties associated with disentangling large aerosol measurements from shattered ice particles. I still believe the clear-sky methodology (discussed in prior review discussions) made results look more consistent and "digestible", with the major example being Figure 5a,d&g and how there is currently a sharp convergence of large aerosol counts at $d(\text{large aerosols}) > 0$ compared with < 0 . But the authors note that major trends are observed regardless of whether the clear-sky methodology is used or not. They also point out that the clear-sky methodology is not applicable when applied to their machine learning analysis.

I do urge the authors to consider the viability of their approach in the future. Two final thoughts concerning this:

- 1) The authors again provide time series attempting to show UHSAS large aerosol measurements are not biased by ice crystals. They provide two time series from the DC3 campaign, both of which indeed do not show an increased frequency of relatively high large aerosol concentrations within cloud. However, both cases do not show a clear example of any large aerosol layer. Noting the relatively low and constant values of $\log_{10}(Na_{500})$ for each time series (the y-axis ranges are extremely small), these results are simply showing samples of $Na_{500}=1$ count, which are slightly varied with the units of $\#/cm^3$ due to minor differences in aircraft speeds. These samples occur at a frequency of approximately once every 30 seconds to 2 minutes. Can we really say this is evidence of a notable background concentration of large aerosols separately observed from a cloud?
- 2) The authors extended the lower bounds of $d(\text{IWC})$ and $d(\text{large aerosols})$ in figure 6. Datapoints within this range are much noisier at these lower values as suspected, highlighting the expected bias of stronger relationships between $Na_{er>500nm}$ and IWC at greater IWC. Because of this, I would recommend removing or rephrasing this statement: "The fact that a near-linear correlations are seen with respect to Na_{500} at both higher and lower IWC values suggests that the ice shattering is less likely a main cause of the higher Na_{500} at in-cloud conditions, since higher IWC values are more likely to induce ice shattering based on previous in-situ observations (McFarquhar et al., 2017)."

Although all major trends are similarly observed whether applying the clear-sky methodology or not, this paper really drives home the point that cirrus occurrence frequencies and properties are intimately related to large aerosol concentrations. Even if general positive relationships were still observed, the strength of their correlation/covariance is likely dramatically influenced by this suspected bias, which still impacts the take-home message.