

## Author Response

The authors would like to thank the reviewer for their clarifications. We have edited the manuscript accordingly.

P7, L163-164: This statement might still be confusing to the reader. In some models, there might be an ice mass/temperature threshold in the mixed-phase temperature regime that defines with respect to which phase state saturation is calculated. That was also the reason why I was asking how you decide the saturation phase state in my previous review. In your case and in Achtert et al. (2025), this temperature threshold is simply the freezing temperature. Therefore, saturation w.r.t. water implies saturation w.r.t. ice, so the “or” is not necessary in the mixed-phase temperature regime. Why not write something like: “Saturation is calculated w.r.t. ice for temperatures below and w.r.t. to water for temperatures above freezing.”

After the sentence in question: “Secondly, a saturation condition is introduced such that a cloud layer requires saturation with respect to liquid water or ice.” We add: “Above (below) 0°C, saturation is calculated with respect to liquid water (ice).”

Fig. 3, 5, B1: I missed that in the first review, but I think the shown box and violin plots need a log transformation of the data to be interpretable. The underlying distributions are some kind of log-normal distribution. If you create the box plots, the features are calculated in the linear space, which is fine for quartiles/median as they are invariant to the chosen scale, but lead to distortions for the whiskers and the violins in the log scale (top right).

As the IQR is calculated in linear units, the “lower” whisker will extend to the minimal value of your data (it would extend almost all the way to 0 if the boxplot function allowed it to). This is also why your violin plots look so stretched and extend to the minimum value of your data. This creates a visual distortion of the violin where the data looks “bottom-heavy” (i.e., you would expect a large number of values at say  $3 \times 10^{-2}$  from the violin, but there are only a few datapoints at that value). The distribution in the violin plot further indicates that there are no values lower than  $3 \times 10^{-2}$ , but as this is only a sample drawn from a theoretical distribution, one can’t infer that from the sample. Log-transforming the data before plotting makes the whiskers/violin plots better interpretable (bottom right). This transformation is of particular importance if you want to compare the shape of the distribution or if the data is multimodal (e.g., aerosol size distribution).

Thank you for noticing this, we have now log-transformed the box and violin plots such that the distributions and whiskers are more appropriately shown. The legends are updated accordingly.

## Final Updates:

- Works under preparation have been removed from the citation list.