We thank the reviewer for their attention to the manuscript and the comments they have made. We reply to these comments below (in blue).

General comments:

My main concerns arise from your frequent statements that the G-Band "improves clearly" the retrieval of various microphysical properties, while you are most of the time not showing any comparisons with in-situ observations or other independent measurements or you are not showing the retrieved quantity from both the Ka-G and Ka-W combination.

While I do agree that the G-Band likely improves the accuracy of the retrieval of the drop size distribution (DSD), the example you provide in the paper in my opinion does not show that the inclusion of the G-Band actually improves the accuracy of the retrieved DSD. Yes, the forward simulated spectra look more similar when you include the G-Band, however, that does not mean that the retrieved DSD is actually "more correct". You have DSD measurements from the disdrometer, could you compare the DSD measurements with the retrievals? Or perhaps you could compare the forward simulated Doppler spectrum to the Doppler spectrum of a fourth, independent radar at a different wavelength which is not used in the retrieval if you have access to another radar.

The disdrometer observations are difficult to use as a ground truth in this case. There are several issues with the disdrometer: it has a poor sampling resolution compared to the radar, in order to get a reasonable count it must collect droplets over a length of time typically at least an order of magnitude longer than the averaging time of the radar spectra and most importantly the disdrometer is measuring the DSD at the surface while the radar observations are taken at 450m, this means that even is some adjustment is made based on average drop velocity the disdrometer and the radar are not observing the same thing. There are also unfortunately no other radars to compare against in this situation.

We have tried to address the issue of comparison, (in line with Reviewer 2's comments) we have made a more robust inclusion of OE error in the manuscript, also showing the benefit of including the G-band in reducing the error.

Also, in your example using DDV to retrieve Dm, you are showing a comparison of Dm retrieved and Dm measured by the disdrometer, however, here I am missing a comparison to the retrieved Dm from the Ka-W DDV to actually show any improvements in comparison with the lower frequency pair. So my main point is: I do not think that you have shown clearly that the addition of the G-Band radar

improves the retrieval of the DSD (or Dm), you have just shown that it can retrieve a DSD (which does not need to be accurate) and that the Dm you retrieve with the G-Band is rather accurate, however, you don't show that the one retrieved from Ka-W is less accurate. I think the paper would benefit greatly if you include a more detailed comparison of the DSD with in-situ (or other) observations and if you compare the retrieved Dm not only with in-situ observations but also with the one retrieved from Ka-W.

We have now included the retrieval of Dm with the Ka-W band DDV combination in Figure 9 and some discussion comparing the Ka-W with the Ka-G

Specific comments:

Line 32: what is the smallest D0 you can retrieve with W-Band? Please specify in the text. This is about 0.7 mm, this has been added to the text

Line 47: please specify what you mean with DDV (probably dual-doppler velocity) Clarified in text

Line 52: perhaps you could elaborate on why there may be double solutions for the DDV retrieval using two radar wavelengths? An explanation has been added in the revised manuscript

Line 65: Do you mean above the freezing level? Below the freezing level ice can cause significant attenuation. Or do you mean below the freezing level in respect to the height? Then you should clarify that. Clarified in text that it is below the freezing level with respect to height

Line 80: remove "to this radiation" Done as suggested

Line 112: remove the second "the sensitivity" Done as suggested

Line 114-115: could you elaborate more on why there are small variations in the success of the G-Band detecting a Mie-notch? Done as suggested

Line 175: possibly "bad" data should be replaced with "unsuited" data Done

Line 177: why do you restrict the vertical wind speed to a maximum of 1.5m/s? In this situation the vertical wind speed should not be greater than that and introducing a reasonable limit to the wind speed decreases the possibility of spurious minima being treated as a Mie notch

Line 182: Perhaps it would be better to call this section "Optimal estimation retrieval", since OE has not been introduced yet Changed as suggested

Line 188: is the G-Band 20 or 30 m away from the others? In the Methods section you said 20 m, here 30 it is about 30m, the method section has been changed

Line 243: replace bad with another adjective Done as suggested

Figure 7c: why is the forward simulated W-band spectrum fitting so badly to the observed spectrum? Is the OE not working properly? We have changed the OE slightly for reviewer 2's comments, the new OE fits better, but part of the OE is fitting as best as it can to all three spectra, this means that it will miss some parts on each

Line 268: I do not see clearly how the G-Band improves the differential Doppler velocities. Perhaps it would be helpful to show Ka-W in addition to Ka-G? Done as suggested

Line 273: why is the G-Band affected less by non-Rayleigh scattering in the ice phase? Ice particles do grow rather large and cause significant non-Rayleigh scattering already in W-Band right? Clarified that this is due to the smaller absolute difference between the Doppler velocity in a non-Rayleigh scattering regime and Rayleigh scattering regime for ice.

Figure 9: why do you not show the Dm retrieved from Ka-W? I thought that was the whole point of the paper, to show the benefits the addition of the G-Band could have compared to just having lower frequency radars Done

Line 284: Much better fit compared to what? Compared to the theoretical curves and the scatter plots of DDV obs vs disdrometer obs. This has been added to the text

Line 303 and following: is there a way you can actually show that the LWC retrieved from the G-Band is more accurate than from the W-Band? I agree that it has a larger potential because the absolute values of PIA are larger, but does that actually make such a big difference? Added sentence in intro for reduced error with Ka-G combo can't actually verify LWC for real world example

Figure 10: could you please add units to the PIA and Dm in the plots? Done as suggested

All your Figures: it is probably a matter of taste, but I would rather have a label on the colorbar than having to search the figure caption for the description of what is plotted here. So I would suggest that you include colorbar labels Done as suggested