

Responses to Additional Minor Comments for "Arctic observations and numerical simulations of surface wind effects on Multi-Angle Snowflake Camera measurements"

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1 Reviewer #1 Minor Comments

L101: Should "distinguished" read "distinguish"?

Yes, corrected - thanks

L212ff: How many cells are there after running snappyHexMesh?

5 This is mentioned in lines 214-215: "This brings the total number of cells to 131,864 when the block is 4 m × 4 m × 5 m."

L232ff: If you have one inlet and slip-/no-slip-conditions everywhere else for velocity, an incompressible flow is not possible. Are the authors sure that the boundary conditions given here are correct?

The outlet boundary condition was omitted by mistake. We have added the statement, "The 'inletOutlet' outlet boundary condition was used, which provides a generic outflow condition," to this paragraph.

10 2 Additional Minor Comment

L138: I'm not sure I understand the methodology correctly. Apparently, the authors used mean Doppler velocity (MDV) as a proxy for the fall velocity? Different than the spectrum width and the edges of the Doppler peak (which were used in Matt Shupe's paper if I remember correctly), MDV is not significantly biased by broadening (in particular below cloud base), so I'm not sure why you mention the Shupe paper here. However, radar return is always dominated by the big particles which is why MDV might be biased towards higher values in comparison to a 'real' mean fall velocity. I would be careful in referring to MDV as 'ground truth' or calling it 'fall velocity', because the comparison of MDV to MASC fall speed is like comparing apples to oranges. The language should reflect that so I would recommend to the KAZR data as mean Doppler velocity.

15 Yes, MDV was used as a proxy for the fall velocity. We removed the reference to broadening in Shupe's work since it is not
20 relevant here, as you pointed out. Rather than referring to MDV as a ground truth fall speed, the first sentence in this paragraph

was changed to: “For comparison to MASC fall speeds, mean Doppler velocity was calculated from the volume of scattering hydrometeors detected by a co-located Ka-band ARM Zenith-pointing Radar (KAZR).” Furthermore, all references to KAZR fall speed were changed to KAZR mean Doppler velocity (throughout the paper, including captions).