

## ***Interactive comment on “The two faces of cirrus clouds” by D. Barahona and A. Nenes***

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We thank the reviewer for the positive feedback and comments.

*Abstract, line 10: I suggest changing “..heterogeneous nuclei to occur..” to something like “heterogeneous freezing to occur”, or “heterogeneous ice nucleation”*

Done.

*Page 30861 last line: “..inhibition of heterogeneous freezing and . . . . Should that rather be homogeneous freezing?*

Yes. Now it is corrected.

*Page 30862, first line in the new section: “though” should be “through”*

Corrected.

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*Page 30862, line 21: I suggest adding “and” before “hence depends on their size”*

Done.

*Page 30864, line 20: Water vapor diffusion coefficient is  $D_v'$  in the equation and  $D_v$  in the text. Does the prime indicate that you use the modified diffusion coefficient? If so, this should be indicated in the text.*

Yes it does. This is now clarified after the equation and in section 3.3.4.

*Page 30865, line 20: I suggest that you add “d” when mentioning Fig. 4 in the parenthesis.*

Done.

*Page 30865, line 21: I believe you missed something on the last line “the assumption that . . . . does not vary . . . ”*

Thank you for pointing this out. It is now corrected.

*Page 30868, line 14: You also missed something in this sentence: “Since . . . . is determined by random. . . ”*

We apologize for this oversight. Corrected.

*Page 30873, line 1: Is  $u_{\text{term}}$  on the same order as  $D_c$  (–) or rather proportional to  $D_c$ ?*

It is proportional. The statement has been corrected.

*Page 30874, line 7: Which subfigure are you referring to in Fig5?*

We refer to Figure 5a in the revised paper. The statement has been clarified.

*Page 30874, line 23: Equation for  $f_{\text{ps}}$  on this page is slightly different from the equation for  $f_{\text{ps}}$  on page 30871. But are they basically the same?*

Thank you for pointing this out. The equation in page 30871 is the correct one. The

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statement has been corrected.

*Page 30876. I suggest that you indicate the subfigure when referring to Fig 4 on line 14, Fig 5 on line 21 and Fig 5 on line 28.*

Done.

*Figures Fig. 1: Please indicate the section number for the Methods section.*

Done.

*Fig. 2: I believe you have not defined  $\alpha_d$  anywhere.*

Good point! It is now defined after equation 1.

*Fig. 3: I do not think Fig. 3c is mentioned in the text.*

Figure 3c was introduced in connection to the assessment of heterogeneous freezing at low  $T$ . We now have included further discussion regarding this figure in section 2.

*Fig 7: I suggest labeling u, H and T0 on the figures instead of in the text. This might make it easier to see what the different conditions are for the simulations*

Good point. The figures have been labeled.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 30857, 2010.

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