

## ***Interactive comment on “Influence of meter-scale wind-formed features on the variability of the microwave brightness temperature around Dome C in Antarctica” by G. Picard et al.***

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Questions answered by the referee: 1. Does the paper address relevant scientific questions within the scope of TC? Yes 2. Does the paper present novel concepts, ideas, tools, or data? Yes 3. Are substantial conclusions reached? Yes 4. Are the scientific methods and assumptions valid and clearly outlined? Yes, for most of them. But see my concerns described below. 5. Are the results sufficient to support the interpretations and conclusions? I think: yes 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Two concerns: a) I put a question mark on the

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physical correctness of using the scaling factor 'phi', a multiplier of the optical radius to get the effective radius of the scattering spheres representing the firn. A small value - on the order of the refractive index of firn (about 1.4) might be arguable. The actual value is much larger. This means that something essential is wrong in the scattering model. b) The expected error of the density measurement (10 to 20 %) was possibly too large for the important role firn density plays in this experiment. 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes 8. Does the title clearly reflect the contents of the paper? Yes 9. Does the abstract provide a concise and complete summary? Yes 10. Is the overall presentation well structured and clear? Yes 11. Is the language fluent and precise? Some improvements needed 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Figure 11 is not well described. I think it should be eliminated, including the associated text in the manuscript ("whale back"). 14. Are the number and quality of references appropriate? Yes, one exception, see below. 15. Is the amount and quality of supplementary material appropriate? Not applicable.

Further comments

On p. 3681, the observation angle is called 'zenith angle'. The correct name here would be 'nadir angle'.

Same page: I do not understand the following text: "the surface moved between 0.4m to 2.5m – with respect to the radiometer vertical"

On p. 3683, reference is given to the HUT snow emission model to refer to an atmospheric emission model. This is not convincing. Please give a more proper reference to an atmospheric model.

On p. 3690: Correct 'mean square root' to 'root mean square'.

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