

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.

G. Picard et al.

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Aut: We thank Richard Kelly for his evaluation and corrections . The paper has been reduced while adding a few lines in the model description which hopefully will help to reproduce similar results.

Richard Kelly (RK): The paper is an interesting study of local scale brightness temperature variations near the Concordia base camp in Antarctica. The research successfully attempts to explore the local scale causes (<100m) of Tb variations at 19 and 37 GHz. This is achieved using a series of field measurements that are used to interpret the ground-based Tb variations and to force a DMRT implementation. Comparisons indi-

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cate that changes in snow packing (density) near the surface in the form of sastrugi are prime causes of observed variations in Tbs. The observed and modeled Tbs fall within the realm of variability of spaceborne Tb observations (Windsat and SSM/I). The paper is well written and logically presented. Perhaps it could be a little shorter in length and contain slightly clearer description of some aspects, especially the model set-up. But the paper is complete and should proceed to publication.

Specific comments:

RK: - Figure 1 needs a context map of where the study site is located on the Antarctic continent.

Aut: Done

RK: - P3688 the authors state that the PR undulations match the Tb undulations for S4-S5 but it would be nice to see these data lined up in the figure together. Would it be possible to combine Figure 6 and Fig 5 to enable the reader to better observe the agreement? Alternatively, perhaps insert vertical gridlines in both to better facilitate the comparison.

Aut: The two figures are merged as suggested.

RK: -P3689 By way of a suggestion, would it be possible to include a more detailed photograph of the snow surface and also a detailed photo of the upper layers of the 2 pits, perhaps with the layers delineated? This would help to support the discussion.

Aut: We do not have photograph of the surface precisely at SP1 and SP2. All the measurements (grain size and density) at SP1 and SP2 have been conducted on the snow core. No traditional snowpit has been dug at these positions because snow properties had to be measured up to several times the penetration depth of microwave which is more than 3 m at 19 GHz.

RK: -Section 3.2 and section 2.3. It would be useful to know how many layers were used in the simulation. Can the authors give a statement on this?

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Aut: The information is added in the method section (2.3): it is 193 for SP1 and 172 for SP2.

RK: -P3692 line 17. Can you be more explicit in this statement, before you define the "Shannon's limit" aspect; do you mean lower sampling or spatial resolution?

Aut: There was a typo error: It is the spatial resolution. The text has been changed.

RK: -P3693 L18 Change "systematically above" to "systematically greater".

Aut: done

Interactive comment on The Cryosphere Discuss., 7, 3675, 2013.