

Interactive comment on “Three examples where the specific surface area of snow increased over time” by F. Domine et al.

Anonymous Referee #2

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Interactive comment on "Three examples where the specific surface area of snow increased over time" by F.Domine et al. (referee #2)

GENERAL COMMENTS

This succinct, well-written paper reports three observed cases in which measured SSA was shown to

increase. SSA is of recent growing interest to the snow community, and the authors mention both

physical (albedo) and chemical-related modeling applications—as well as the importance of

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including processes whereby SSA demonstrably increases in such applications.

The three cases reported are plausible enough to those familiar with snow under field conditions.

SPECIFIC COMMENTS

section 3.2 (description of process leading to increased SSA at Alert site) while fully plausible

and most likely fully correct (especially when considering the photomicrographs), readers might

be aided by included air temperature and temperature gradient data as in section 3.1. This would

help readers judge the relative impact of alternative processes that would also affect SSA—such

as might come from strong temperature gradients that might have accompanied the 21 Feb wind

storm. In section 3.1 for example, a strong gradient transformed a crust into depth hoar,

increasing SSA.

section 3.3 presents a plausible explanation for the SSA increase of sublayer (a). however,

without photomicrographs it is not so easy to be as definitive as the 2 previous cases—and the

authors clearly state this & describe an alternate explanation. this is highly commendable

scientific reporting technique.

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- 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, increasing SSA is 'novel'
and field data supporting this is likewise novel.
- 3) Are substantial conclusions reached? yes, this behavior of real snowpacks should be accounted
for in relevant physical & chemical snow models.
- 4) Are the scientific methods and assumptions valid and clearly outlined? yes, they are detailed
with many references.
- 5) Are the results sufficient to support the interpretations and conclusions? yes
- 6) Is the description of experiments and calculations sufficiently complete and precise to allow
their reproduction by fellow scientists (traceability of results)? yes, they are detailed with
many references.
- 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, very clearly

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- 9) Does the abstract provide a concise and complete summary? yes, very succinct & well-written
- 10) Is the overall presentation well structured and clear? yes
- 11) Is the language fluent and precise? yes, no English issues
- 12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?
- 13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? NO
- 14) Are the number and quality of references appropriate? yes
- 15) Is the amount and quality of supplementary material appropriate? yes

Interactive comment on The Cryosphere Discuss., 2, 649, 2008.

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