The Cryosphere Discuss., 3, C247–C248, 2009
www.the-cryosphere-discuss.net/3/C247/2009/

The Cryosphere Discussions

Interactive comment on "Simulation of the specific surface area of snow using a one-dimensional physical snowpack model: implementation and evaluation for subarctic snow in Alaska" *by* H. W. Jacobi et al.

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Received and published: 28 September 2009

This paper presents the first achievement of the numerical simulation of snow specific surface area (SSA). This is major step for improving snow models through the introduction of SSA. Indeed, it opens new perspectives for a better simulation of snow albedo, snow thermal conductivity and snow chemistry. Two methods are described to introduce SSA in an existing physically-based snow model which are evaluated against field measurements. The results are very convincing and the authors rigorously discuss the promising performance of both methods and their limits. These limits are partially due

to the limits of the previous version of the snow model and the authors present a comprehensive study of sensitivity to important parameters of the former snow model. The paper is very clear with relevant references and very comprehensive information on the experimental conditions and on the observations which have been collected to assess the performance of the simulated SSA. No doubt that this paper affords to be published in the Cryosphere Discussions. I have just identified two minor points to be clarified: - SSA calculations mainly refer to dry snow conditions, which is reasonable regarding the test site located in continental Alaska. However, a short mention of SSA dynamics under wet conditions would reinforce the perspective for future simulation of SSA under any climate conditions. This could be easily done in the in §2.4 or in §4. - I do not understand line 18 page 699 which is probably due to a typing mistake.

Interactive comment on The Cryosphere Discuss., 3, 681, 2009.