

Interactive comment on “Fractional snow-covered area parameterization over complex topography” by N. Helbig et al.

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The manuscript presents a new parameterization analysis to assess snow cover over complex topography. The snow depth data have been retrieved from digital photogrammetry and airborne laser scanner. The parameterization has been related to terrain parameters and mean snow depth indicator. This approach has been applied and tested in three different regions in Switzerland and Spain. The proposed parameterization performed better than the previously presented ones cited from literature. According to the presented results authors conclude that they developed a parameterization of fractional snow covered area over complex topography independent of a specific geographic region. The topic of the paper is certainly relevant for HESS and its interests

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have been described in the introduction section of the manuscript. Results are innovative and promising.

General comments:

- 1) I would better explain and describe the selection procedure of the test sites where the method has been applied and possibly I would add a few more case studies in order to give more generality to the paper outcomes
- 2) Some of the conclusions appear too strong and too general considering previous observations and moreover that it has been applied only for peak of winter for only a small number of snow conditions
- 3) I would better highlight the limit of the paper outcome related to its data (site selection, time, variability of snow conditions)
- 4) Provide a more clear interpretation from the physical processes point of view of the paper outcomes in order to better understand the meaning and the relevance of the results deeply and precisely described in section 4

Specific comments:

- 1) Please better clarify how you individuated peak of winter timing
- 2) At line 19 p. 9792 describe under which hypothesis you assume spatially homogeneous melt
- 3) At line 24 p. 9797 subtraction should be the opposite. HS = winter-summer
- 4) If possible please better motivate and describe the differences between the three study sites shown in table 1
- 5) I appreciated the readability of figures and plots

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