

Interactive comment on “Snow depth estimation by time-lapse photography: Finnish and Italian case studies” by Marco Bongio et al.

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We would like to thank the Reviewer for the time and valuable comments to our work. Below we will report our replies to each of your comments following this format:

Reviewer'2 comment

Authors reply

Reviewer #2 says :“This study presents application of FMIPROT tool to estimate snow depth from images of snow stakes at selected sites in Finland and Italy. In my opinion, topic is interesting and within the scope of the journal. However, the manuscript is, in my opinion, not ready for publication in its current form. The main reasons are not clearly formulated and demonstrated the novel scientific contributions of the study.”

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Authors reply: In the revised version of the manuscript, we made major modifications in order to formulate and demonstrate our novel scientific contributions. In few words, we introduced a new methodology which is, totally automatic and easy to use for retrieving snow depth. We demonstrated our methodology successfully in 3 different case studies. Our methodology will be very useful for many applications including scientific research where the snow depth retrieval is needed where the AWS station installation is too dangerous or impossible. In the manuscript, we also showed that our methodology on the retrieval of snow depth can be more practical and accurate at the test sites, where configurations such as stake and camera positions were not planned, just using the existing configurations.

Reviewer #2 says :“The Introduction section is rather general and does not clearly present what the current status of the snow depth retrieval by digital camera is and what the recent research gaps are.”

Authors reply: We modified the introduction section where the current status of snow depth retrieval by digital camera and recent research on snow depth retrieval and gaps are clearly visible.

Reviewer #2 says :“The list of innovative aspects of the works then include large number of points, but the novelty of many of them is rather low or not clear (these are not clearly connected with the results of previous studies). So, I would suggest to make the Introduction section and formulation of the aims and novelty much more targeted and specific.”

Authors reply: Yes, we have re-formulated the Introduction section, focusing the attention to time-lapse photography and the open questions.

Reviewer #2 says :“If the main objectives are to evaluate the tool, then I would suggest to present methodology/tools first and then describe the dataset used in this study.”

Authors reply: Our objective is to present a new methodology which is totally automatic

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and easy to use for retrieving snow depth. We modified the manuscript as suggested.

Reviewer #2 says :“The description of the sites can be shortened and information which is relevant for all tested sites can be mentioned only once (for example information that in the late afternoon the images are very dark is mentioned for different sites, but it will be enough to indicate that once for all sites and specific times for specific sites can be indicated for example in a table).”

Authors reply: Yes, in the revised version of the manuscript, we have shortened the description of case studies.

Reviewer #2 says :“The Method section reads like a manual to the tool, but this needs to be clearly linked with the main objectives of the paper and formulation/demonstration of the novelty. So please consider to revise this part and describe methodological steps/approaches which are considered here as a novel contribution. The same applies for Results. Please present here more clearly some story and take home message for the readers, i.e. what the new findings are.”

Authors reply: Yes, in the revised version of the manuscript, we have reformulated the methodology into more scientific presentation. We also rewrote the results more clearly underlining take home messages and new findings for readers.

Reviewer #2 says :“Finally I missed a discussion section which can link (and compare) the new findings of this study with previous research. This part can also include some lessons learned part and implications of this study for the future investigations.”

Authors reply: In the revised version of the manuscript, we have distinguished “Results” section from “Discussion” where we report lessons learned and implications for the future investigations.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2019-193>, 2019.