

## ***Interactive comment on “Spatio-temporal measurements and analysis of snow depth in a rock face” by V. Wirz et al.***

**Anonymous Referee #2**

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### General comments

The authors have conducted valuable and thorough field work and present a good data analysis. In its very nature the conclusions might be limited to the investigated area. Similarly, the data is from one (two) winter season(s) and this might also limit the general nature of the conclusions. Both issues are pointed out by the authors. Still the work presents some important findings and is an important step in the evaluation of snow cover variation, which is important for many fields.

### Specific comments

The coefficient of variation (CV) is used by the authors (e.g. P1393, P1394) to describe the variation of the snow depth HS. However, spatial variation of snow depth distribution

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in the rock face is only evaluated qualitatively (visually, e.g. red circles in Fig. 4). Is it possible to quantify this spatial variation? if so, the strength of the paper would be improved.

The way the surface roughness parameter VRM is calculated is presumably quite important for the correlations. Therefore I think it is necessary that it is described in more detail than done on P1390, L10.

On P1395 it is shown that flatter parts in the rock face have less snow than the steeper parts. This is counter-intuitive as also mentioned by the authors. It is therefore important to mention (as is already done) that this is most likely because the flat areas are wind scoured, and that therefore that generalization of the observations to other areas might be difficult.

On P1398, L13-15 it is commented that no avalanching was observed during the observation period. I believe that in such a steep rock face there is considerable amounts of snow coming down as small sluffs during snowy periods. These are hard or impossible to observe. The fact that such mass wasting was not observed in the field does therefore not give very much weight to the argument presented.

### Technical corrections and typing errors

In addition to the points above I suggest the following suggestions are considered:

- P1384, L6: It would be good to point out even more clear that the resolution of one metre refers to the spatial grid of interpolated snow depth measurements and not the resolution of the individual snow depth measurements. For example “...was used to obtain a grid of interpolated snow depth (HS) data with a grid resolution of one metre.”
- P1384, L27: You could be more specific by using “snow avalanche formation” instead of “snow avalanches”.
- P1386, L10: add the word “has”: “...laser scanning (TLS) has increased the...”

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- P1387, L18: add the words “snow depth”: “...the longest records of snow depth observations worldwide...”.
- P1390, L11: To simplify, remove the words “in this context” or change to “in this study” or simply “here”.
- P1390, L25, 26 (and throughout the manuscript): What does disposition mean? Is it the same as aspect?
- P1391, L28 (and throughout the manuscript): The meaning of exposition is not clear. Do you mean aspect?
- P1397, L14: The authors name is Essery not Esseroy. This is correctly spelled in the reference list.
- P1400, L17: “Micro scale” is misspelled.
- Fig 6 caption: “...mean snow depth...” is misspelled.

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Interactive comment on The Cryosphere Discuss., 5, 1383, 2011.