

Interactive comment on “Characterisation of the melting layer variability in an Alpine valley based on polarimetric X-band radar scans” by Floor van den Heuvel et al.

Anonymous Referee #1

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The paper deals with an accurate method to characterise the spatial and temporal variability of the melting layer using the spectral analysis. The method has been applied to a large dataset of high resolution X-band polarimetric radar data from two measurement campaign in Switzerland. The main merit of the manuscript is to apply for the first time a method based on the Fourier Transform to investigate the variability in space and time of the melting layer. The methods and results of the paper are well described and discussed but in my opinion the conclusions are not adequately supported by the analysis.

Major comments:

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(1) It is not clear how the effects of the topography have been related to the spectral analysis. We know that the spatial and temporal behaviour of the melting layer depends not only on the orographic context but also on the temperature, humidity and microphysical processes. At the end of Section 4.4 an analysis from a digital elevation model (DEM) has been mentioned but not figures or quantitative measurements are shown. To enhance the conclusions, I suggest to show one figure/table by comparing the DEM (or a statistic clutter map) with the spectral analysis of the melting layer.

(2) I suggest to strongly modify Figure 11 because it is hard to read.

Minor comments:

(1) Figures 5(b), 7, 9, 10 and 12: the x-label is missing.

(2) Figure 7: the legend is wrong.

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