

Interactive comment on “Determination of hydrological roughness by means of close range remote sensing” by A. Kaiser et al.

Anonymous Referee #1

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Definitely the topic and the approach of the authors is relevant for publication. The introduction and references are relevant, more recent publications on roughness could be found, but not many related to Manning's, ...

Some abbreviations are not explained properly (GSD, SD, RR, ...).

Concerning methodology: SfM is definitely fine for high density DEMs, but is the model scale appropriate? There is no data on hydrology of the experiments in the paper, but ca 170 ml/sec at the width of 1m of the plot indicates very shallow flow depths? Is the Manning equation appropriate with “classic” coefficients or is it a bit “out of purpose” (originally the approach was derived for rather big flows/depths)? This might be at least discussed in the introduction or methodology. Measuring Q at the outlet pipe may have

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suffer from serious time lags induced by concentration of the flow back to the pipe in such a precise experiment. How the flow depth (for Manning's) was derived? Just by estimating from equation of continuity? I am afraid it seriously varied throughout the plot (in depressions, but also along the slope). In some DEMs – the preferential flow was identified. The authors overcame this by extracting the realistic flow-paths from the DEM, but still very variable flow velocities do not support using sheet flow formulas (criteria). The velocity was extracted by high-speed image recording – no data in the paper? How it was then averaged? Was the frontline integrated over the whole cross section? What is the measuring precision influence on the presented numbers? Is the shallow flow valid explanation for the sigmoid curve dependence, or might this be other parameters – such as not easily recognizable flow velocities for rilling plots (preferential flows)? How many repetitions were performed at the locations? The plot data (figure 6, 7) show very limited number of experiments? Is that one location or all? The fluid density was considered different from water (based on sampling?) in the equation? Values not specified. Interior orientation of the camera – was it easy to keep it unchanged – when using the zoom lens (even at end position of the zoom)? For F2.8 and close surface-camera distance I would suppose large areas out of focus? The four tie-points, from the presented image they seem to be fixed very loosely – no problem with keeping them in position for the whole experiment? From the presented DSM image it looks that 1 mm DEM had to be already rather smoothed, any tests performed on the data precision necessity?

Generally I respect the author's assumptions.

Interactive comment on SOIL Discuss., 2, 401, 2015.

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