

***Interactive comment on “Terrain surfaces and 3-D
landcover classification from small footprint
full-waveform lidar data: application to badlands”
by F. Bretar et al.***

F. Bretar et al.

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In order to make the response to the reviewer clear, the author comments are bold. According to the editor in chief, I picked up relevant scientific remarks and answered them. Practically, most of the remarks have been discussed, but not all of those related to typo. A new version of the manuscript will be posted very soon.

The "accuracy study of the DTM" (Section5) could be reduced or should be considered in the title.

Section concerning the DTM accuracy has been removed from the manuscript

153-11: the only visible layer from passive sensors -> depending on the density of the

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observed vegetation

AC: " the only visible layer from passive sensors in case of dense vegetation"

152-24: Remote sensing is an effective set of techniques ?

changed

154-1: Please state "friction coefficients"?

"Vegetation heights are then converted into friction coefficients as inputs in their model." Rewritten, as follows :

->Vegetation heights are then converted into friction coefficients (Manning-Strickler coefficients) for hydraulic modeling.

154-8: same technology -> I disagree, the digitalization and recording of the waveform has to be done

I agree, but it is only based, not cloned.

154-9: They -> The reflected pulse not the lidar system

changed

155-29: Please add further references for this scientific field with direct citation, e.g. Reitberger et al. (2008), Jutzi Stilla (2006), Wagner et al. (2006). Reitberger J, Krzystek P, Stilla U (2008) Analysis of full waveform LIDAR data for the classification of deciduous and coniferous trees. International Journal of Remote Sensing, 29(5): 1407-1431 Jutzi B, Stilla U (2006) Range determination with waveform recording laser systems using a Wiener Filter. ISPRS Journal of Photogrammetry Remote Sensing 61 (2): 95-107 Wagner W, Ullrich A, Ducic V, Melzer T, Studnicka N (2006) Gaussian Decomposition and Calibration of a Novel Small-Footprint Full-Waveform Digitising Airborne Laser Scanner. ISPRS Journal of Photogrammetry Remote Sensing 60 (2): 100-112

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added

157-9: Please add an additional sentence about the trajectory (navigation)

Done

157-12: Which main influences?

"The emitted electromagnetic wave interacts with artificial or natural objects depending on its wavelength and is modified accordingly."

158-21: literature -> can you please provide references

C. Mallet, F. Bretar (2009) Full-Waveform Topographic Lidar: State-of-the-Art ISPRS Journal of Photogrammetry Remote Sensing 64(1): 1–16.

160-second paragraph: Was a boresight and leverarm correction done?

yes, we corrected the data from the boresight.

162-9: Was a fine registration done, eg by ICP? The accuracy might suffer from randomly measured vegetation points

This part has been removed from the text

162-18: For monostatic laser systems $\Theta_i = \Theta_s$ can be assumed. Please revise the expressions in general Source <-> sensor Distance <-> range I think it would be better to stay with one of these expressions. They are mixed up and might confuse the reader. Changed - see the comments of the other reviewer

the section has been rewritten. see my comments of Reviewer 2

167-12: D8 ? Please provide references The extraction of drainage networks from digital elevation data

ADDED

J. F. O Callaghan, D. M. Mark Comput. Vision Graphics Image Process., Volume

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28, page 323–244 - 194

158-3: geometry ? Position, viewing angle? **the link to the sensor geometry is the time-stamp**

166-5: w.r.t.?

with regard to -> changed

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 151, 2009.

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