Nat. Hazards Earth Syst. Sci. Discuss.,
doi:10.5194/nhess-2016-315-RC2, 2016

Natural Hazards and Earth System Sciences
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Interactive comment on "Calculation of coseismic displacement from Lidar data in the 2016 Kumamoto, Japan, earthquake" *by* Luis Moya et al.

Anonymous Referee #2

Received and published: 30 October 2016

General comments: This manuscript presents a methodology to calculate co-seismic displacement using LIDAR data acquired after the recent earthquakes occurred in Kumamoto, Japan and the result were validated with ground motion records around. The proposed methodology represents a good alternative to monitor ground deformation using remote sensing data showing great potential to be used in disaster management and would be worthy of NHESS publication after minor revision.

I would like to suggest going deeper in the literature review. For instance, one point that was not mention is the advantages and/or disadvantages of the proposed methodology compared with other methods considering several aspects such as data availability, data coverage, application for disaster management assessment.

Specific comments: Page 2, line 17: Since this method calculates the permanent dis-

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placement based on two different DSM scenes, it would be interesting to mention the time of acquisition of the LIDAR data.

Page 4, line 23: Please, explain why the original data was interpolated to 10 cm, and why not to 25 cm or 5 cm? Is any optimal spatial resolution considering factors such as detail of analysis, computational power?

Page 4, line 29: I understand why 201 x 201 pixel window was chosen, it however does not clearly explain why largest windows size can not be used too. Related with the previous comment, it would be interesting to see what is the relationship between the pixel size and the window size.

Page 6, line 26: Considering that a 201 x 201 pixel window is used to calculate the co-seismic deformation, please explain what is the selection criterion of the value from the DSM result that is compared with the displacement time history. On other words, is the value at the location of the seismic station used in this comparison?

Page 7, line 5: Although, the Figure 13 does show good agreement of the co-seismic displacement between the result using LIDAR data and the ground motion records, a quantitatively validation would be more convincing. For instance, the result of this methodology can be correlated with the result obtained from DInSAR analysis of PALSAR-2 data conducted by the Geospatial Information Authority of Japan (http://www.gsi.go.jp/BOUSAI/H27-kumamoto-earthquake-index.html)

Minor comments are printed in the attached document.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-315/nhess-2016-315-RC2-supplement.pdf

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