

## ***Interactive comment on “Detection of collapsed buildings due to the 2016 Kumamoto, Japan, earthquake from Lidar data” by Luis Moya et al.***

### **Anonymous Referee #2**

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The paper examines the usage of LiDAR scans in detecting and characterizing collapsed building. General detection of buildings is based on geocoded database coupled with pre-event laser scanned data. Each building is then characterized by three parameters based on pre- and post-event scans: height differences ( $\Delta H$ ), standard deviation ( $\sigma$ ) and correlation ( $r$ ). Based on these parameters the authors test three different methods to classify collapsed and non-collapsed building. They make further use of the parameters in order to characterize the collapse pattern. The paper is well written, and provides an approach to damaged building detection. However, some points should be considered: The detection of collapsed buildings is essentially change detection via laser scanning in urban areas. Nevertheless, the authors did not refer to such (or other) change-detection related works, where height difference is used as the

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most reliable and efficient way to detect changes. It is unclear why this case should be different, yet it the authors consider it as an innovation. Although a major part of the paper deals with the classification of the collapsed buildings, this objective is not spelled out, and no reference to it – or to its importance – is made before page 4, where it is somewhat hidden within the general methodology of detecting collapsed buildings in general. The standard deviation and the correlation coefficient parameters hardly affected the detection, but were vital to identifying the pattern of the collapse. Though this is an interesting and new usage in these parameters, it is missing throughout the paper, especially in the discussion. As the discussion is quite short I would consider merging it with the conclusion to one “Discussion and conclusions” section.

Focused comments: Throughout the paper: please change “Lidar” to “LiDAR” Page 3, line 24: “geocoded building footprint dataset” – is that a vector map of the area? Line 27: “reduced by 1 m” – what does this mean? Is that an offset from the building boundaries? Page 6, Eq. 4-9: the order is reversed to the comments below. It should start with the elements that build the final coefficient, and not the other way around.

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