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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Incorporating multi-source remote sensing in the detection of earthquake-damaged buildings based on logistic regression modelling" *by* Qiang Li et al.

Qiang Li et al.

liqiang08@163.com

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1.Abstract: page 1 line 10 - different "modes" should be changed with different "types" as it is more appropriate. page 1 line 22 - "which is be regarded" change to "which is regarded". page 1 line 28 - by features do you mean data sources? Reply: Thanks for the reviewer's suggestion. We have changed it in the revised paper. Yes, we do mean data sources. 2. Study case and datasets page 4 row 21-22 - what type of sensor did you used? what is the date and time of the acquisition? page 4 row 24 - the authors mention to use a 0.5 m image but at page 7 row 1 the resolution changes to 0.2. Please clarify page 4 row 27 - please provide date and time of the acquisition

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Reply: Sorry. We have added the types of sensor and the time of the acquisition in the revised paper. Sorry, we have changed the resolution of the image to 0.5m. 3.Seismic characteristics of multi-source remote sensing images page 5 row 19 - "the square nature of the structure", is not clear, do you mean the "ground projection"? Reply: Sorry, "the square nature of the structure" in the paper means the shape characteristics of building structure, we changed in the revised paper. 4. 4.1 Data processing page 7 row 5 - please cite in an appropriate way Google maps (here you can find a hint:http://writeanswers.royalroads.ca/faq/199225) Reply: Thanks for the reviewer's suggestion. We have changed it in the revised paper. 5. 4.1 Data processing page 7 row 21 - please explain better what do you mean by geometric feature Reply: Geometric features are the most direct physical attribute of targets. The unit we analyze shape features is the object. It usually contains the area, perimeter and other information of the targets. Aspect ratio, shape index, density, compactness, and asymmetry are adopted in our experiment. The shape index describes the smoothness of the image object border. Density describes the distribution in the pixel 20 space of an image object. Compactness describes the compactness of image objects; it is similar to the boundary index but based on area. Asymmetry describes the relative length of an image object compared with a normal polygon. 6. 4.4 Model element determination page 8 row 26-27 - is this an empiric assumption? Reply: YesïijŇthe method of model element determination is empiric assumption. After many experiments, we analyze the segmented objects to determine the optimal results. 7. 5.1 Features statistics and analysis page 9 row 17 - all images are resampled to 1 m. What is the method used?(nearest neighbour) Reply: Yes, the resample method used in this paper is nearest neighbor. 8. 5.3 Results and verification page 11 row 27-30 - the authors state that "the moultisource remote sensing image is better than the results of other combinations" but soon after you say that the "combined SAR image and optical image is the best". It's not clear which method is more accurate. Reply: Sorry about it. The result of the analysis that considers the multi-source remote sensing image is best among the results of other combinations. The result of combining SAR image and optical image

comes second. 9. 5.3 Results and verification page 12 row 10 - please pin point the building in the image or write it's geographical coordinates Reply: Thank you. We have added the geographical coordinates in the revised paper. 10. Figure 2 please mention the date and time stamp of each image (hear or in the text) Reply: Thank you. We have added the date and time stamp of each image in the revised paper. 10. Figure 3 please mention the geographical coordinates of the building Reply: Thank you. We have added the date and time stamp of each image in the revised paper. Intact building after the earthquakeïijĹcentered at approximately 104.46°E and 31.83°NïijĽ 11. Figure 4 please mention the geographical coordinates of the building Reply: Thank you. We have added the date and time stamp of each image in the revised paper. Destroyed building after the earthquakeïijĹcentered at approximately 104.45°E and 31.84°NïijĽ. 12. Figure 8 (f) ELE parameter is missing Reply: Sorry about it. We have added it in the revised paper. Please refer to the attachment for the revised contents 13. Figure 9 parameter BR and ELE are never mentioned in the text or in the other figures. Reply: Sorry about it. BR means the brightness of spectral features in optical images. The specific calculation method is not introduced in this paper, but is given in the form of references. ELE means the elevation. The expression in the paper is as follows "In addition to elevation information, the main feature of the DSM image is the geometric feature." The above two abbreviations are marked in the revised paper.

The full text will be revised by a mother tongue.

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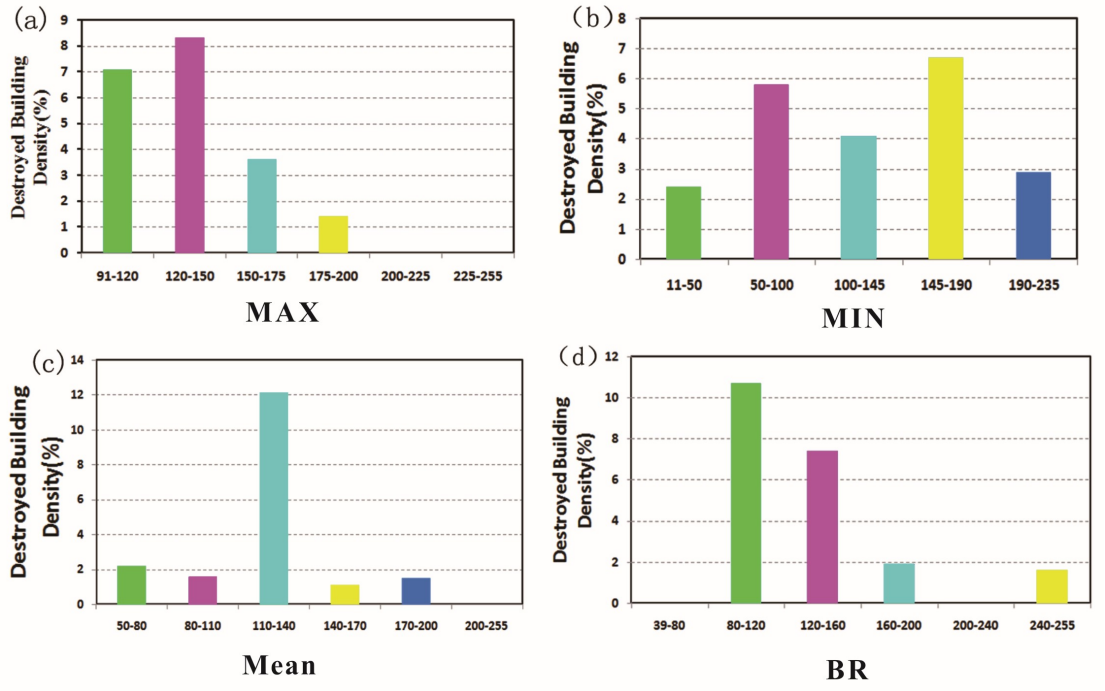

Fig. 1. Density distribution of destroyed buildings with different spectral features. (a) MAX; (b) MIN; (c) mean; and (d) brightness.

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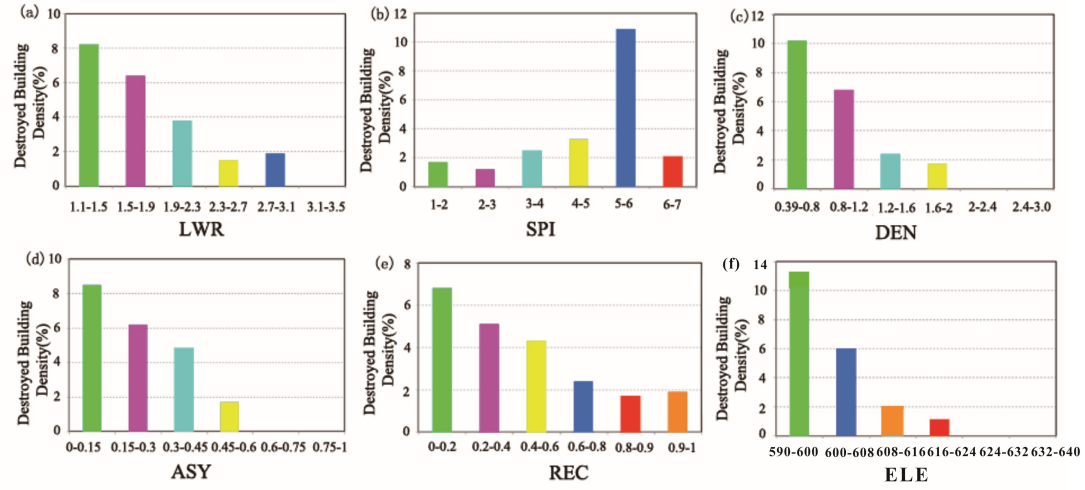

Fig. 2. Density distribution of destroyed buildings with different geometry features: (a) LWR; (b) SPI; (c) DEN; (d) ASY; (e) REC; and (f) ELE

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Table1.Detail image information

Number	Data type	Type of Sensor	Date of Acquisition
1	Optical multispectral image	UAV	4 July 2013
2	LiDAR	RIEGL VZ2000	20 July, 2014
3	SAR data	TERRASAR	4 December 2014

Fig. 3. Table of detail image information