Natural Hazards
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Discussions

Interactive comment on "Developing fragility functions for the areas affected by the 2009 Samoa earthquake and tsunami" *by* H. Gokon et al.

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Thank you very much for your precious comments. I would like to reply to all of the specific comments and questions. And, I would modify the manuscript based on the specific comments and suggested technical corrections. Please see the supplementary file which is uploaded at the same time.

Reply to the comment 1 : Thank you for your comments. As you mention, the originalities of this study are that (1) More detail classification of the building damage was performed using very high-resolution satellite images captured on pre- and post-tsunami disaster. (2) Attempt to validate the fragility functions by comparing the number of estimated building damage and the ground truth data. In addition to that, the other

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originality of this study is that (3) To analyze the quantitative vulnerability of Samoa islands region against tsunami features not only in terms of inundation depth, but also flow velocity and hydrodynamic force.

Reply to the comment 2 : Thank you for your comment. As you commented, there is a possibility to increase the accuracy of fragility function if the advanced statistical method is applied. The limitation of classical method is that, if the number of samples for constructing fragility function is quite small, it is impossible to construct a fragility function. On the other hand, fragility function based on logistic regression can be constructed with the small number of samples. This is the advantage of logistic regression analysis. Before we improve the method for future works, we have to identify which is the dominant factor to induce building destruction. There are several kinds of considerable factors to induce building destruction such as the shape of the coastal line, features of the soils in a coastal region, and the positions of buildings in a coastal town. I assume, after we find the dominant factor which is related to the vulnerability of the coastal region, we can select the appropriate method for regression analysis, which shows the best fitting result.

Response to technical corrections : Thank you for your kind instructions and comments. Please see the supplementary file, which is the improved manuscript made by following the comments.

Please also note the supplement to this comment: http://www.nat-hazards-earth-syst-sci-discuss.net/2/C958/2014/nhessd-2-C958-2014-supplement.pdf

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