

## Study on seismic intensity estimation method in seismic hazard mitigation systems

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Seismic intensity in JMA scale is widely used as an index of ground motion level closely related to earthquake damage in Japan. Seismic hazard mitigation systems such as damage estimation and early warning utilize seismic intensity estimation using magnitude and hypocentral distance. The estimation procedure commonly uses general attenuation formula of maximum velocity, site amplification factor from the surface soil profile, and relationship between seismic intensity and maximum velocity. However, the evaluation results sometimes contain large estimation error due to the variation of source and wave propagation effects. Especially, the intensity attenuation of comparatively deep events shows heterogeneous characteristics due to the existence of irregular Q-value layers in the path from the source to site.

Observed seismic intensity data in Kanto plain were analyzed. Firstly, the mean site effect obtained from averaging biases of seismic intensity for each observation point is depicted on the map of Kanto plain. The shaking trend strongly depends on surface geology and topography. Secondly, seismic intensity data observed at a certain point. It was found that the seismic intensity depends on not only magnitude and hypocentral distance but also source location and focal depth. The accurate intensity estimation method was proposed using the combination of regression attenuation formula and bias correction factor given for each epicenter. The bias correction factor includes influence of source and wave propagation effects. It is indicated that the proposed method decreases the estimation error greatly.