Development of ensemble tsunami inundation forecasting method using ABIC

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An ensemble forecasting method for tsunami inundation is proposed. The method consists of three elemental techniques. The first is a hierarchical Bayesian inversion using Akaike's Bayesian Information Criterion (ABIC). The second is Montecarlo sampling from probability density function. The third is ensamble analysis of tsunami inundation simulations on multiple tsunami sources with the consideration of source uncertainty. Simulation based validation of the method was conducted. On a case of tsunami generated by a great Nankai trough earthquake, tsunami inundation around Nagoya Port was estimated by using tsunami waveform data of offshore GPS buoys. The error of estimation of tsunami inundation area was about 10% even if we used only ten minutes observation data. The estimation accuracy of waveforms on/off land and spatial distribution of maximum tsunami inundation depth is demonstrated.

Keywords: ensamble forecast, ABIC, Tsunami