Systematic evaluation of performance of real-time tsunami forecasting method based on tsunami source inversion and development of indication for real-time assessment of the tsunami forecasting accuracy

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After the 2011 Tohoku earthquake occurred, offshore tsunami observation networks are expanded around Japan and many researchers are developing tsunami forecasting methods in which the offshore tsunami data are used. We developed a tsunami-forecasting method based on inversion of offshore tsunami waveform data for initial sea-surface height distribution, named tFISH. Forecasting accuracy of tFISH algorithm depends on a spatial relationship between a tsunami source and offshore tsunami stations. This tendency will be strong in tsunami forecasting in the Nankai-trough region and the Japan-trench region before large-scale dense S-net is developed, because the density of offshore tsunami network is biased. This will result in large variety of the timing when the forecasting becomes accurate enough to be used for appropriate update of tsunami early warning. In this presentation, we will show the results of numerical simulations of tsunami forecasting, focusing on the following two points that are important for its practical operation in tsunami early warning system: (1) systematic evaluation of tFISH performance by varying a tsunami source location systematically, (2) development of indication which can assist decision makers of tsunami warning to judge the timing when tFISH-forecasting results become accurate enough to be used for update of tsunami warning.

Keywords: Tsunami early warning, Real-time tsunami forecasting, Offshore tsunami observation, Near-field tsunami, Disaster mitigation, Inverse problem