S154-005 **Room: Function Room B** **Time: May 20 10:00-10:15**

Tsunami Source of the 2004 off Kii Peninsula Earthquake: Tsunami Waveform Inversion based on the Dispersive Theory

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Dispersive tsunami was observed off Muroto during the 2004 off Kii Peninsula Earthquake (M7.4). In order to estimate the tsunami source accurately, we conducted tsunami waveform inversion analysis based on the dispersive tsunami equations.

The 2004 off Kii Peninsula earthquake was an intraplate event within the Philippine Sea Plate. The earthquake, which is characterized by a high-angle (~40 degree) dip-slip faulting in deep ocean, generated short-wavelength tsunami. When the tsunami wavelength is short compared to water depth, the dispersion effect becomes significant, which is not included in the conventional tsunami simulation based on the linear long-wave theory. Saito and Furumura [2009] successfully simulated the dispersive tsunami recorded at an ocean bottom pressure gauge off Muroto by conducting the 3-D tsunami simulation.

The present study estimated the tsunami source, or initial water height distribution, of the 2004 off Kii Peninsula earthquake by the tsunami waveform inversion. Unlike the conventional studies which use the linear long-wave theory, this study employed the dispersive tsunami equations to correctly simulate the dispersion effect. Furthermore, densely distributed (10 km interval) numerous (400 points) basis functions were used in order to represent a general and realistic tsunami source. We estimated the initial water height distribution from the inversion analyses of 9 offshore tsunami records along the Pacific coast of Japan [Satake et al. 2005] but did not use coastal tide-gauge records in order to avoid strong local effects. The estimated initial tsunami distribution overlaps with the aftershock region, which suggests that the event occurred on a plane striking to NW - SE direction. This is consistent with the result of the conventional tsunami analysis by Satake et al. [2005]. However, the new source model can simulate the observed offshore tsunami records better than the conventional one. The total amount of displaced water volume is estimated as 1.7 x 10^9 ~2.0 x 10^9 [m^3].

For comparison, we also carried out the inversion by employing the linear long-wave theory; the estimated initial tsunami distribution protrudes considerably from the aftershock region. In order to reproduce the dispersive tsunami in the observed records, artificial tsunami sources need to be located outside the aftershock region when the non-dispersive tsunami equations are used. The total amount of the displaced water volume (2.0 x 10^9 [m^3]) is, on the other hand, equivalent to the estimation of the dispersive tsunami equation taking the error range into account.

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