

Integrated simulation of strong ground motion and tsunami for large earthquakes in Hyuga-nada, Japan

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Hyuga-nada is located at the southern extension of the Nankai trough, Japan. In Hyuga-nada, the Philippine Sea Plate subducts northwest beneath the Eurasian Plate at a rate of about 40-70 mm/year. This plate motion causes earthquakes which generate strong ground motion and tsunami. In this study we perform integrated simulations of seismic-propagation and tsunami in Hyuga-nada region. We apply the scheme proposed by Takenaka et al. (2012, ACES) to Hyuga-nada area for calculating of seismic motion and near-field tsunami based on a three-dimensional earth model with a sea layer. This scheme can simultaneously model all of the seismic waves and static deformation in the solid earth and acoustic and tsunamis waves in sea from sub-oceanic earthquakes. We then simulate seismic wave propagation for a sub-oceanic earthquake, including both land and ocean-bottom topographies and a seawater layer with gravity. We use the structure data of Kishimoto (1999) for land and ocean-bottom topography and the Japan Integrated Velocity Structure Model (2012, Headquarters for Earthquake Research Promotion, Japan) for subsurface structure. In the presentation we show numerical simulations for some events such as the 1996 Oct. 19 Hyuga-nada earthquake (M6.9).

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