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Abstract title

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Abstract text

It has been proposed that earthquake complexity can be described by multi-scale heterogeneity in fracture energy of the fault interface (Ide and Aochi, JGR, 2005). The 2011 Tohoku earthquake revealed us such multi-scalability of the fault heterogeneity, seemingly a cascade-rupture mode (Aochi and Ide, EPS, 2011; Ide and Aochi, accepted in Tectonophysics, 2013). We are then interested in the effect on the ground motion through systematic works on the model parameters. This study presents the ground motion simulations based on the multi-scale dynamic rupture simulations in the regional scales for both shallow moderate earthquakes and subduction large earthquakes. In all cases, the synthetic seismograms in time vary according to the variation in dynamic rupture process (rupture directivity, rupture directivity, and slip distribution, source time function). The frequency content changes significantly in the near field, while it is quite homogeneous for a receiver located far away.

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