

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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STT056-P02

Room:Convention Hall

Time:May 26 16:15-18:45

Seafloor deformation due to earthquakes with solid-fluid coupling

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There are many researches about the generation and propagation of tsunami based on numerical simulation. These researches, however, simulate tsunamis based on a linear long wave theory under the assumption that initial wave shape equals to the static deformation of the seafloor. The deformation of the seafloor is a function of time and space reflecting the dislocation of sub-seafloor earthquakes, and we have to consider the kinetic deformation of the seafloor for more precise simulations. In the past, Suzuki (2006) studied tsunami propagation including the kinetic deformation of the seafloor caused by the dislocation of a fault, and considered the influence of solid upon liquid. His research, however, did not perfectly take the interaction between solid and liquid into account, because the deformation of solid and the analysis of liquid could not be coupled at the same time due to numerical difficulties in the simulation. We simulated the propagation of seismic wave to aim at the investigation of the displacement of seafloor considering the coupling between solid and fluid using a finite difference method.