Dynamic source parameters during 1997 Kagoshima earthquake

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In recent years, source rupture processes of many large earthquakes were reported based on kinematic source inversion method. Because their analyses estimate all slip displacements as a function of time and space, it is difficult to solve inversion problems without constraints which cannot be explained on a physical basis. A dynamic source model satisfies the physical relationship between stress and the strain field on the fault plane. Goto and Sawada (2006) propose that this dynamic source model introduces that physical relationship into source inversion analysis, and that space resolution is improved in the estimated model because the model is based on several time independent parameters; rupture time, dynamic stress drop, and slip weakening distance.

We show the estimate results of dynamic source parameters during the 1997 Kagoshima earthquake by dynamic inversion analysis. The higher freedoms for the rupture time are given than the others' freedoms in order to avoid too smooth slip distribution.

We show the difference between kinematic and dynamic results. The checkerboard test in same conditions is also presented to clarify the resolution.

Reference
Goto, H. and S. Sawada (2006), Dynamic source inversion based on stable formulation and on identification of the resolution level via a multi-scale approach Earthquake, GJI, in submitting.