Problems in estimation of Gc using Finite difference method

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Fracture energy distribution on the fault of past earthquake have been estimated by many seismologists. However, it was contaminated by many factors, such as effect of lowpass filters in data processing, misfit of crustal model in Green function, inappropriate parameterization in source inversion, and also, inaccuracy in dynamic modeling, etc.

We discuss the problem in dynamic modeling in this paper.

Gc estimation

Although there are two method for estimation of Gc. we discuss the method proposed by Miyatake et al.(2004) in the paper.

Method of computation

For simplicity we simulate 2D antiplane shear crack by using BIEM, several types of FD and BIEM. By comparing the results, we obtained the following conclusions.

1) Present Frictional stress calculated using past slip causes underestimation of Peak stress
2) Self similarity in initial part of rupture are favorable for stable estimation of Gc.
3) Gc estimation by using FD is consistent with that by BIEM.