Geophysical Research Abstracts, Vol. 5, 11168, 2003

FINITE-FAULT RADIATION MODELING, INTERPOLATION OF GREEN'S FUNCTION OVER THE FAULT SURFACE

J. Burjánek (1), **J. Zahradník** (1)

(1) Department of Geophysics, Faculty of Mathematics and Physics, Charles University, V Holešovičkách 2, 180 00 Prague 8, Czech Republic, Fax: +420221912555, E-mail: burjanek@geo.mff.cuni.cz

We model high frequency radiation of finite fault by combining two different approaches, the composite and kinematic models. The composite model makes up time histories of mainshock from time histories of subevents. The subevent size distribution is fractal. The time histories of subevents are computed by kinematic model. In other words, subevents are taken as finite faults, too. Kinematic modeling is a numerical evaluation of representation theorem, integral over the fault surface, including slip and Green's function. It is solved by simple discretizing fault surface and summing up contributions from the samples. Integrand is supposed to be constant on each sample. To get accurate results one has to have a large number of samples and thus a large number of Green's functions. To reduce their computing time, we introduce several interpolation techniques, such as 2D Fourier transformation and 2D cubic splines, to get Green's function from coarse grids to sufficiently dense grids. The methods are tested with respect to their accuracy and efficiency. The tests of the interpolation methods are performed in a 1D layered crustal model, and the Green's functions in coarse grids are calculated by the discrete-wavenumber method. To make the computations even faster, we also improve the integration scheme by introducing a frequency-dependent sampling of the fault. The methods allow us to study efficiently the influence of finite subevents on the final time histories, e.g. to compare them with the point source subevents. All calculations are performed for the 1999 Athens earthquake, for which we also compare simulations with observed data.