Geophysical Research Abstracts, Vol. 7, 05106, 2005 SRef-ID: 1607-7962/gra/EGU05-A-05106 © European Geosciences Union 2005



## **3-D** Spectral Element simulations of the earthquake rupturing

G. Festa (1) and J.-P. Vilotte (1)

(1) Department Sismologie, Institut de Physique du Globe de Paris

Spectral Element method has been shown to be a powerful tool for the simulation of rupture dynamics along planar and non-planar 2-D faults. The combination of the geometrical flexibility and the exponential spectral convergence can be efficively preserved even for non smooth dynamics, such as faulting and the short wave radiation associated with it.

We present here exensions of the method to 3-D fault simulations. This involves a second-order time stepping allowing for an implicit solution of the contact and frictional constrains on the fault, and standard second order propagation scheme away from the fault. The high-frequencies generated on the fault surface are selectively absorbed in order to propagate the seismic wavefield in the numerical grid.

Numerical examples will be presented and the efficiency of the method assessed. This work wassupported by the European SPICE project.