



## **Fast Source Parameter Estimation from Green Function Deconvolution: Application to Shallow Earthquakes**

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We have developed a new methodology to rapidly and automatically retrieve the earthquake source parameters : magnitude, focal mechanism, hypocentral depth and source time function.

The P-wave signal duration is estimated by filtering the data within a narrow frequency band centered around 1 Hz. Over this frequency band, only the P-wave train (P, pP and sP) remains. The determination of the source parameters is based on the deconvolution of the Green function. The parameter search is achieved by an exploration of the parameter space. Seven parameters are involved: strike, dip, rake of the rupture plane, minimum depth of the fault plane, maximum depth of the fault plane, the hypocenter depth and a pseudo-rupture vertical velocity. The Green function is integrated over the whole vertical dimension in order to take into account some extended source effects. The pseudo-rupture vertical velocity is used to integrate over the vertical dimension of the fault plane.

We tested the method for all the earthquakes of magnitude larger than or equal to 6.5 and from 1997 to 2007. The obtained results are quite promising and interesting. We pointed out the fact that this methodology allows to complete the catalogue of the source parameters by adding the relative source time function at each station. A precise comparison between this new broadband technique and the low-frequency global CMT catalog will be presented.