DYNAMIC STRESS FIELD OF ADVANCED KINEMATIC SOURCE MODELS

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Recently, advanced theoretical kinematic source models have been developed, since previous models lack complexity commonly observed in inversion studies of earthquake sources. Such theoretical models provide complex evolution of slip on a fault, together with more or less feasible radiated wave field which follows widely accepted omega-squared model. As these models are purely kinematic, they don't provide explicit constraints on parameters controlling the rupture dynamics. The aim of this study is to analyze the stress field on the fault associated with the prescribed slip history. Full dynamic stress history is calculated on the fault, using boundary integral method formulated in spectral domain (Bouchon, 1997). Basic characteristics of resulting stress field are inferred and discussed in relation to recent dynamic source models of real earthquakes. Particulary, we determine the static stress drop and make estimations of the strength excess and the slip weakening distance taking into account the slip weakening constitutive relation. Such analysis is performed for a number of slip functions sets. We have focused our study on k-squared model with k-dependent rise time, presented by Bernard *et al.* (1996) and generalized by Gallovič and Brokešová (2004). The different sets of slip functions are generated by varying the maximum rise-time, general shape of slip function, the slip pulse width, etc. As a result of this parametric study, we try to constrain free parameters of studied kinematic models from the dynamic point of view.