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## SCEC 2006 Annual Meeting: Abstracts

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**Abstract Title:** Modeling Earthquake Dynamic Ruptures in Realistic 3D Heterogeneous Material -- Preliminary Results

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**Abstract:** What is the effect of crustal structure on earthquake ruptures? In order to answer this question we model dynamic ruptures in faults embedded in half-spaces whose material properties are heterogeneous. To better isolate the effects of material structure on the dynamic process of faulting, we model simple earthquakes where all the initial conditions are homogeneous over the fault plane. Thus, the only source of heterogeneity to the dynamic earthquake rupture is the material structure. With the goal of understanding the effect of specific features of the material structure we model earthquakes propagating in faults embedded in increasingly complex material structures: (1) homogeneous half-space, (2) vertically layered half-space, (3) two homogeneous quarter-spaces separated by the fault, and (4) a 3D heterogeneous material structure. It is our aim to simulate realistic Earth-like conditions, therefore the 3D heterogeneous material structure we use is the one inferred by detailed seismic studies for the Parkfield section of the San Andreas Fault (Thurber et al., 2006). Parkfield is one of the best-studied fault-zones in the world, and its material structure is known with great detail. In this work we study the effect on a dynamic earthquake rupture of the large-scale variations in material properties that are present in the Parkfield model of Thurber et al. (2006). Whereas this tomographic model does not contain information on the very fine fault-zone structure, which may be of decisive importance for the process of dynamic faulting, it does contain realistic information on large-scale variations of the material structure, whose role is also important to understand.

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