Thrust Faulting Dynamics

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Abstract

Many researchers have noted that the asymmetric non-vertical geometry of dip-slip faults causes them to behave quite differently from more symmetrical vertical strike-slip faults. Observational studies (e.g., Nason, 1973; Steinbrugge et al., 1975; Cocco and Rovelli, 1989; Abrahamson and Somerville, 1996; Allen et al., 1998) have shown that dip-slip faults often produce more ground motion on the hanging wall than on the footwall, and that surface-rupturing thrust faults can produce higher ground motion than otherwise similar normal faults. Analog and numerical models of such faults (e.g., Brune, 1996; Oglesby et al., 1998; Brune and Anooshehpoor, 1999; Oglesby et al., 2000; Oglesby and Day, 2001) have shown that these effects are caused directly by the asymmetric fault geometry and the stress interaction between the fault and the free surface of the earth. Other factors such as material heterogeneity and spatial variation in frictional properties may further affect the rupture and slip patterns of large thrust faults. In this poster, I present some results of numerical models of thrust faults in hope that they may spur more research on potential dynamics effects in tsunami generation.

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