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ESTIMATES OF SLIP WEAKENING DISTANCE FOR DIFFERENT DYNAMIC RUPTURE MODELS

We model the dynamic propagation of a 2 - D in - plane crack obeying to either slip weakening (SW) or rate - and state - dependent friction laws (R&S). We compare the value of slip weakening distance (D_c), adopted or estimated from the traction versus slip curves, with the critical slip distance measured as the slip at the time of peak slip velocity ($D0_c$). The adopted friction law and the constitutive parameters control the slip acceleration as well as the timing and the amplitude of peak slip velocity. Our simulations with R&S show that the direct effect of friction and the friction behavior at high slip rates affect the timing of peak slip velocity and thus control the ratio D_{0c}/D_c. The difference observed in this study between the D_c values and the inferred D_{0c} can range between few percent up to 50%.