

## **PARKFIELD EARTHQUAKES: CHARACTERISTIC OR COMPLEMENTARY?**

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### **SUMMARY**

The idea that the Parkfield section of the San Andreas fault, California, fails in identical consecutive earthquakes has been around since 1979. In order to test whether Parkfield earthquakes are characteristic we compare the spatial distribution of co-seismic slip distribution of the two most recent  $M_w \sim 6$  events. We model the 1966 and 2004 Parkfield earthquakes from near-fault strong motion seismograms. The rupture models, as well as independent observations, indicate that slip during the 1966 and 2004 Parkfield earthquakes occurred in different regions of the fault. This result implies that regions of a fault that are frictionally locked may remain locked even during a main shock (moderate-size earthquake). In this scenario, large earthquakes occur when all the locked regions of a fault are “synchronized” and ready to slip at the same time.