

Source model from active fault and geological information

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We reviewed relationship between rupture process and fault geometry for recent 8 large earthquakes from the 1992 Landers earthquake to the 2004 Pakistan earthquake. The review shows that fault rupture started at or in the vicinity of a fault jog such as branching, bending and stepover, except for the 1999 Chi-Chi earthquake. The review also revealed that fault rupture terminated at or just beyond fault jogs for all the 8 earthquakes.

We also compared surface displacements with the slips inverted from seismic waveforms for the same 8 earthquakes. The comparison shows that the inverted slip is generally consistent with spatial distribution of surface displacements. It is also suggested that each geometrical segment possesses only one shallow asperity where the slip is remarkably large.

In conclusion, the segment structure of active fault systems is crucial for estimating initiation and propagation of fault rupture as well as location of shallow asperities.