

Initial phase for large earthquakes: Generality and duration

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We analyze the IRIS broadband velocity data of all 70 large events with Mw 7.0-8.3 during 1993-1998 to confirm the generality of the existence of the initial phase. The 68 events show the existence of the initial phase. Thus, large events with Mw 7-8 generally possess the initial phase.

The duration of initial phase for the deep events below 400 km is shorter than that for the shallow events at the same magnitude. The result of this study, together with previous works, shows that the seismic moment scales as the cube of the duration of initial phase for the events smaller than 10^{18} Nm, and scales as the square for the events larger than 10^{18} Nm. This result suggests that there is a difference between large events and small events in the initial part of the rupture.