Rupture nucleation and propagation of a large earthquake reviewed from stress triggering studies

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We review rupture nucleation and propagation processes for the recent earthquake couplets occurred around the world, such as the 1992 Landers-1999 Hector Mine, California, earthquakes and the 1999 Izumit and Duzce earthquakes, Turkey. We find that the nucleation for the subsequent earthquake started from where local seismicity had been stimulated by the previous event, and then one of the small ruptures could have been cascaded to the locked segment that was identified as a seismic gap before. This speculation may allow us to use the recent seismicity together with the active fault distribution to estimate the future nucleation point and direction for rupture propagations. Dynamic rupture process for gigantic earthquakes may not need such temporal static cascading process since the fault system has been well matured to skip the process.