

Aseismic slip and earthquake triggering from joint analysis of geodetic and aftershock data

Asaf Inbal, Oct. 29. 2013, TO seminar

The presentation will consist of two parts. In the first part I will discuss recent results from the San-Jacinto Fault (SJF), one of the most active faults in southern California. Moderate mainshocks (M4-5) on the SJF trigger rich aftershock sequences and pronounced aseismic slip. This complex pattern of seismic and aseismic deformation has important implications for seismic hazard estimation, and may also entail clues about the physical processes that govern fault slip at depth. I will present a new approach for static inversions that incorporates the geodetic and aftershock data sets. This approach provides resolution power at depths inaccessible to the surface geodetic network, and allows us to gain important insights onto the fault mechanical properties. In the second part of the talk I will present the analysis of data recorded by dense Long-Beach seismic array (>5000 geophones). I have used these recordings to detect and locate microseismicity occurring along the Newport-Inglewood fault, an active fault located beneath downtown LB. The temporal distribution of seismicity shows distinct patterns. Diurnal seismic activity is highly periodic, which may suggest that many of the events are induced by anthropogenic activity near the surface. Analysis of night-time activity reveals several seismic swarms with durations of a few weeks. Visual inspection of the GPS time-series did not point to a clear aseismic transient associated with these swarms.