Patterns of the seismic generation rate detected by the Southern California seismic network (SCSN).

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Several patterns of the generation rate, SGR, of the seismic activity detected by the SCSN network are determined. SGR time series are derived from the SCSN catalogue (years 1981-2007) considering local magnitudes equaling to or exceeding 1.5, then being assured magnitude completeness of the chosen database. Patterns are characterized by six parameters. First, an irregularity index based on entropy concepts; second, time trend analysis, including statistical significance; third, autocorrelation and power spectrum contents; fourth, cross-correlation and cross-power spectrum; fifth rescaled analysis and interpretation of the Hurst exponent in terms of persistence, anti-persistence or randomness of SGR; finally, the parameters of the statistical distribution of the seismic rates. SGR series are obtained for the whole SCSN spatial domain, (320 - 370N) x (1140 - 1220W), and for cells of 10x10 size within the SCSN domain. 23 cells of 10 x 10 depict high enough seismic activity to generate representative local SGR series, being possible to characterize interactions among cells, basically by means of cross-correlation and cross-power spectrum analysis. Parameters for cells containing 30 earthquakes, 3 out of them including the notable main shocks of Landers, Northridge and Hector Mine, with seismic moment magnitudes, MW, of 7.3, 6.7 and 7.1 respectively, are revised. The six parameters are also computed for the aftershock areas of the three mentioned main shocks and specific periods of solely background seismic activity, removing the interference of aftershock activity and/or activity of other close seismic crisis. Thus, patterns previous to a seismic crisis and after the crisis can be compared.