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Earthquakes and faults at Mt. Etna (Italy): time-dependent approach to the seismic hazard of the eastern flank

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A time dependent approach to seismic hazard assessment, based on a renewal model using the Brownian Passage Time (BPT) distribution, has been applied to the best-known seismogenic faults at Mt. Etna volcano. These structures have been characterised by frequent coseismic surface displacement, and a long list of historically well-documented earthquakes occurred in the last 200 years (CMTE catalogue, Azzaro et al., 2000, 2002, 2006). Seismic hazard estimates, given in terms of earthquake rupture forecast, are conditioned to the time elapsed since the last event: impending events are expected on the S. Tecla Fault, and secondly on the Moscatello Fault, both involved in the highly active, geodynamic processes affecting the eastern flank of Mt. Etna.
Mean recurrence time of major events is calibrated by merging the inter-event times observed at each fault; aperiodicity is tuned on b-values, following the approach proposed by Zoeller et al. (2008). Finally we compare these mean recurrence times with the values obtained by using only geometrical and kinematic information, as defined in Peruzza et al. (2008) for faults in Italy.
Time-dependent hazard assessment is compared with the stationary assumption of seismicity, and validated in a retrospective forward model. Forecasted rates in a 5 years perspective (1st April 2009 to 1st April 2014), on magnitude bins compatible with macroseismic data are available for testing in the frame of the CSEP (Collaboratory for the study of Earthquake Predictability, www.cseptesting.org) project.

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