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## Statistical inference and validation of stress release models applied to some seismogenic Italian zones

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We present a way for assessing time dependent earthquake hazard through a class of stochastic processes: the stress release models. These models are the probabilistic translation of Reid's theory of the elastic rebound, widely used to in the analysis of the historical catalogues for China, Japan and Iran. The main idea of these models is that an earthquake produces a sudden decrease of the amount of stress present along the fault; then the tectonic strain rebuilds gradually over time and the subsequent event would occur when the stress exceeds the strength of the medium. Different versions of these models exist depending on the different conjecture on the physical process which evolves on regional scale: in the simple model a unique physical process acts in the region, in the so-called *independent* model a different physical process, with different loading rate, is present in each subregion, whereas the *linked* model contemplates the possibility of positive or negative interactions among different zones. We have estimated the model parameters on the learning data set constituted by the earthquakes with magnitude not smaller than 5, occurred from 1600 to 1992 in some seismogenic zones of Southern Italy. Then we have simulated the behaviour of the models in the subsequent interval 1993-2004 and on the basis of such simulations we have predicted the time of the next event in each zone. The forecast values are compared with the events recorded in the Italian catalogue in the same time interval.