Earthquake forecasting in the CSEP Italian testing region

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In this talk we intend to illustrate the Italian contribution to CSEP. CSEP (Collaboratory for the Study of Earthquake Predictability, www.cseptesting.org) is an international initiative that basically aims to compare and test quantitatively any kind of (testable) earthquake forecasting/prediction models. The CSEP infrastructure is mostly composed by a testing region, where different competitive models will forecast/predict the future seismicity, and a testing center, where the models will run independently from the modelers and the model performances are evaluated quantitatively and ranked.

Italy recently became a new CSEP testing region. The significant improvement of the INGV (Istituto Nazionale di Geofisica e Vulcanologia) seismic network has allowed a quite satisfactory spatio-temporal detection capability of the seismic network and robustness to be achieved. After describing in detail the completeness of the current INGV seismic bulletin, we also introduce some of the earthquake forecasting/prediction models that will be run to forecast/predict future earthquakes in Italy. A particular attention will be devoted to a model developed by INGV group based on a Double Branching technique. The Double Branching is a time-dependent model and assumes that each earthquake can generate other earthquakes, through physical mechanisms acting on two different time scales. The model is currently used to forecast earthquakes on different testing regions (Western Pacific and World) and it will be applied to Italy and other testing regions. Results obtained by retrospective forward applications show that the model is able to forecast large earthquakes significantly better that other models like Poisson and classical ETAS model.