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An Earthquake Rupture Forecast model for central Italy submitted to CSEP project

B. Pace (1) and L. Peruzza (2)

(1) GeoSis-Lab, Earth Science Dep., University of Chieti-Pescara, Chieti, Italy (b.pace@unich.it), (2) OGS Istituto Nazionale di Oceanografia e Geofisica Sperimentale, Sgonico (TS), Italy (lperuzza@inogs.it)

We defined a seismogenic source model for central Italy and computed the relative forecast scenario, in order to submit the results to the CSEP (Collaboratory for the study of Earthquake Predictability, www.cseptesting.org) project.
The goal of CSEP project is developing a virtual, distributed laboratory that supports a wide range of scientific prediction experiments in multiple regional or global natural laboratories, and Italy is the first region in Europe for which fully prospective testing is planned.
The model we propose is essentially the Layered Seismogenic Source for Central Italy (LaSS-CI) we published in 2006 (Pace et al., 2006). It is based on three different layers of sources: the first one collects the individual faults liable to generate major earthquakes (M >5.5); the second layer is given by the instrumental seismicity analysis of the past two decades, which allows us to evaluate the background seismicity (M ≲5.0). The third layer utilizes all the instrumental earthquakes and the historical events not correlated to known structures (4.5<M<6), by separating them into seismotectonic provinces shaped on a geological-structural basis. The second and third layers act as poissonian sources, while a simplified time-dependent hypothesis has been introduced for some individual sources, computing the conditional probability of occurrence of characteristic earthquakes by Brownian passage time distribution. Beside the original model, updated earthquake rupture forecasts only for individual sources are released too, in the light of recent analyses (Peruzza et al., 2008; Zoeller et al., 2008).
We computed forecasts based on the LaSS-CI model for two time-windows: 5 and 10 years. Each model to be tested defines a forecasted earthquake rate in magnitude bins of 0.1 unit steps in the range M5-9, for the periods 1st April 2009 to 1st April 2014, and 1st April 2009 to 1st April 2019.

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