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## Earthquake forecast testing experiment in Japan: Overview and test results

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We joined the Collaboratory for the Study of Earthquake Predictability (CSEP) and installed, through an international collaboration, the CSEP Testing Center in Japan as a part of the Japanese earthquake prediction research program (2009-2013). We have started to conduct a verifiable prospective testing experiment since November 2009. Its major feature of the experiment consists of using Japan, one of the most seismically active and well-instrumented regions in the world, as a natural laboratory. To make full use of this location, we have set up the infrastructure and rules for this Japanese experiment by slightly modifying the original CSEP. The experiment consists of 12 categories, with 4 testing classes with different time spans (1 day, 3 months, 1 year and 3 years) and 3 testing regions called "All Japan," "Mainland," and "Kanto." A total of 91 models were submitted, and are currently under the CSEP official suite of tests for evaluating the performance of forecasts. Demonstrating example test results is a key element to illustrate possible scenarios of the experiment. In this presentation, we present an overview of the experiment and several results obtained for the "All Japan" and "Mainland" regions. We argue that the results are just the first of its kind and more trials under the same controlled environment need to be attempted to understand the universal feature of each model and to look for the intrinsic predictability of earthquake rupture process. This turns out to be one of the gold standards of the CSEP mission.

The details of the results are given at <http://cseptesting.eri.u-tokyo.ac.jp/results/>. See also the special issue of the Earth, Planets and Space "Earthquake Forecast Testing Experiment for Japan," hopefully published in March 2011.

Keywords: Earthquake dynamics, Global collaboration, Computational seismology, Earthquake interaction, forecasting, and prediction, Mathematical and computer modeling, Statistical analysis