



A forecast experiment of earthquake activity in Japan under Collaboratory for the Study of Earthquake Predictability (CSEP)

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One major focus of the current Japanese earthquake prediction research program (2009-2013), which is now integrated with the research program for prediction of volcanic eruptions, is to move toward creating testable earthquake forecast models. For this purpose we started an experiment of forecasting earthquake activity in Japan under the framework of the Collaboratory for the Study of Earthquake Predictability (CSEP) through an international collaboration. We established the CSEP Testing Centre, an infrastructure to encourage researchers to develop testable models for Japan, and to conduct verifiable prospective tests of their model performance.

We started the 1st earthquake forecast testing experiment in Japan within the CSEP framework. We use the earthquake catalogue maintained and provided by the Japan Meteorological Agency (JMA). 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 105 models were submitted, and are currently under the CSEP official suite of tests for evaluating the performance of forecasts. The experiments were completed for 92 rounds for 1-day, 6 rounds for 3-month, and 3 rounds for 1-year classes. For 1-day testing class all models passed all the CSEP's evaluation tests at more than 90% rounds. The results of the 3-month testing class also gave us new knowledge concerning statistical forecasting models. All models showed a good performance for magnitude forecasting. On the other hand, observation is hardly consistent in space distribution with most models when many earthquakes occurred at a spot. Now we prepare the 3-D forecasting experiment with a depth range of 0 to 100 km in Kanto region. The testing center is improving an evaluation system for 1-day class experiment to finish forecasting and testing results within one day.

The special issue of 1st part titled Earthquake Forecast Testing Experiment in Japan was published on the Earth, Planets and Space Vol. 63, No.3, 2011 on March, 2011. The 2nd part of this issue, which is now on line, will be published soon. An outline of the experiment and activities of the Japanese Testing Center are published on our WEB site; <http://www.eri.u-tokyo.ac.jp/ZISINyosoku/wiki.en/wiki.cgi>