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One-day earthquake forecasting experiment in Japan after the 2011 Tohoku-oki earthquake

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An experiment for earthquake predictability in Japan started in 2009 with a framework of CSEP. We have conducted one-day, three-month, one-year, and three-year forecasting experiments with three different regions of Japanese Islands; all Japan including sea area, main lands without sea area, and Kanto area(Nanjo et al., 2011; Tsuruoka et al., 2012). We currently have 160 modes for three regions and four periods.We conducted a retrospect one-day forecast of aftershocks of the 2011 Tohoku-oki earthquake showing that all proposed models failed in consistency tests immediately after the mainshock but in several days some of the models recovered its performance of forecasting (Nanjo et al., 2012).A current method for short-term forecasting has limitation of a period of one-day, which is arbitrarily determined. A shorter time period may be necessary for very intensive seismicity. Seismic activities in Japan have changed very much after the 2011 Tohoku-oki event, which brought us an idea that current forecasting models should be modified. We will present some new results of one-day forecasting experiments in Japan to discuss how to get information about real time earthquake hazard to mitigate earthquake risk. A new method to test performances of a model is also proposed.

Keywords: Earthquake forecasting, One-day forecasting, seimicity, Tohoku-okiearthquake, Statistical seismology