

Extended introduction

The primary goal is to establish forecast systems of earthquake occurrence for Japan. Our approach is based on the creation and buildup of methods that can be used for high-resolution earthquake forecasts in space and time through the application of statistics- and physics-based models of earthquakes to Japanese seismicity. In order to achieve the goal, quantitative testing of earthquake forecast models and the development of testing methodology are important parts of our researches.

We carry out our project under the national Observation and Research Program for Prediction of Earthquake and Volcanic Eruption (2009-2013). The project participants are working on several aspects of the earthquake forecast problem.

- Researchers at Japanese universities develop a framework that can be used to assess the validity of proposed earthquake forecast methods in order to build up methods of high-resolution spatiotemporal earthquake forecasts via the application of statistics- and physics-based models of earthquakes to seismicity. Specific examples for this development include quality control of necessary geophysical data to meet research requirements and scientific experiments to validate the proposed forecast methods.
- Another research at Japanese universities focuses on crustal heterogeneity. The researchers carry out computer simulation studies for improving the known earthquake physics laws that govern seismicity statistics such as frequency-magnitude Gutenberg-Richter (GR) distribution of earthquakes and related parameters like GR b-value. This aims at a theoretical clarification of the relation between large earthquake occurrence and space-time parameter fluctuation.
- Seismologists at National Research Institute for Earth Science and Disaster Prevention (NIED) make seismicity-related observational results available for earthquake forecast researches. In addition, they apply existing test methods to earthquake forecast models in order to examine the validation of the suitability of such test methods.
- Research activity at Meteorological Research Institute (MRI) involves the sophistication of methodology for crustal dynamics forecasts to find spatiotemporal characteristic patterns of seismicity, which can be used to aim at the development of new earthquake forecast methods.

In addition, we work with a team of worldwide researchers developing the global Collaboratory for the Study of Earthquake Predictability (CSEP).

Initial research activity is mainly carried out at Earthquake Research Institute (ERI), University of Tokyo, in collaboration with Japanese institutions, and we anticipate further development all over the Japan.