Abstract

Short-Term Alert for Medium- and Large-Size Earthquakes Based on
Markov Analysis of Seismic Data

Mohammadreza Ratimitabar

We propose a novel method for analyzing precursory seismic data before an earthquake that treats them as a Markov process and distinguishes the background noise from real fluctuations due to an earthquake. A short time (on the order of several hours) before an earthquake the Markov time scale t_M increases sharply, hence providing an alarm for an impending earthquake. To distinguish a false alarm from a reliable one, we compute a second quantity, T1, based on the concept of extended self-similarity of the data. T1 also changes strongly before an earthquake occurs. An alarm is accepted if both t_M and T1 indicate it simultaneously. Calibrating the method with the data for one regionprovides a tool for short term alert for an impending earthquake within that region.