

Impact of automatic catalog quality on real-time aftershock forecasting

*Takahiro Omi¹, Yosihiko Ogata^{2,3}, Katsuhiko Shiomi⁴, Bogdan Enescu^{2,5}, Kaoru Sawazaki⁴, Kazuyuki Aihara¹

1.Institute of Industrial Science, the University of Tokyo, 2.The Institute of Statistical Mathematics, 3.Earthquake Research Institute, University of Tokyo, 4.National Research Institute for Earth Science and Disaster Prevention, 5.Faculty of Life and Environmental Sciences, University of Tsukuba

A hypocenter catalog is the main input for earthquake forecasting. Thus the quality of the catalog may have a considerable impact on the forecasting performance. This issue is important especially for aftershock forecasting because the short-term forecast is prepared based on the hypocenter catalog available in real-time during occurrences of aftershocks, but its quality is generally low as compared to the final version of the edited catalog. For example, many aftershocks including even moderate ones in the first few hours after a main shock are missing in real-time data. Here we are concerned with automatically determined hypocenters without any manual amendments, and we examine how the raw quality of the real-time data affects the performances of aftershock forecasting. In this study we examine the automatic hypocenter catalog of the High Sensitivity Seismograph Network (Hi-net [1]), and conduct forecast experiments of inland aftershock sequences in Japan. We compare forecasting performances between this Hi-net automatic catalog and the JMA revised catalog [2]. We also consider several automatically modified versions of the Hi-net catalog, and examine what kind of factors in the raw catalog are important for improving the forecasting performance.

[1] Okada, Y. et al. (2004), Recent progress of seismic observation networks in Japan -Hi-net, F-net, K-NET and KiK-net-. Earth, Planets and Space 56, 15-28.

[2] T. Omi, Y. Ogata, K. Shiomi, B. Enescu, K. Sawazaki, K. Aihara, "Automatic aftershock forecasting: A forecast test of aftershocks using the real-time data in Japan"
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