

## A detection method for large earthquake based on counting a number of seismic intensity observation stations

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An Earthquake Early Warning (EEW) was issued for central Miyagi Prefecture and surrounding areas 8.6 seconds after the 2011 Tohoku Earthquake was detected. The warning times before a seismic intensity corresponding to 5-lower, that was observed at K-NET and KiK-net stations, are about 15 seconds for Miyagi Prefecture, more than 20 seconds for Iwate and Fukushima Prefecture and more than one minute for Ibaraki and Tochigi Prefecture. The EEW played a role in providing information in terms of early warning. On the other hands, a seismic intensity of 5-lower or greater was observed over a wide area from Nakano Prefecture to Aomori Prefecture, so it is clear that the EEW system underestimated the seismic intensity. In addition, the first Tsunami Warning that was issued three minutes after the earthquake occurred also underestimated the height of the actual tsunami. The common factor in these underestimations is mainly the underestimation of the earthquake's size. Therefore in this study, we have developed a detection method for large earthquake based on counting a number of seismic intensity observation stations. The advantage of this method is that it is not always necessary to have information regarding the earthquake source. The method we have developed, counting a number of the seismic intensity observation stations, is a relatively simple method. But we found out that it is effective for detection of large earthquakes that are inland or offshore close to land (fig.1). In addition, when used in combination with the real-time calculation method by Kunugi et al. (2008), there is the benefit of making the real-time processing easier.

Keywords: seismic intensity, earthquake early warning, K-NET, 2011 Tohoku Earthquake

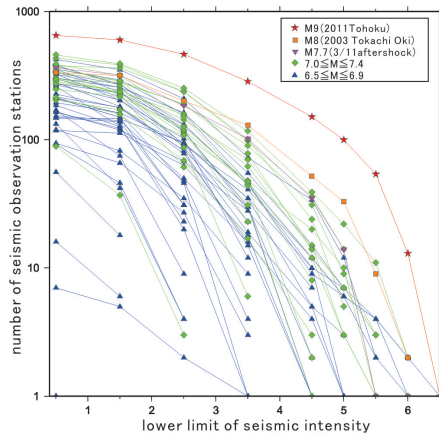


fig.1