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Fast Estimate of Rupture Process of Large Earthquakes via Real Time Hi-net Data
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We developed a real time/automated system based on Hi-net seismic array that can offer fast and reliable source information, for example, source extent and rupture velocity, for earthquakes that occur at distance of roughly 30- 85 degrees with respect to the array center (Figure 1).?

We perform continuous grid search on a Hi-net real time data stream to identify possible source locations (following?Nishida, Kawakatsu, and Obara, 2008, JGR). Earthquakes that occurred off the bright area of the array (30- 85 degrees with respect to the array center) will be ignored. Similarity of the waveforms, and location variations of the local maxima from neighboring windows are used to verify the occurrence of large earthquakes. Once a large seismic event is identified successfully, back-projection will be implemented to trace the source propagation and energy radiation using pre-calculated station corrections derived from nearby earthquakes that occurred previously. An inversion will be then applied to get the detailed high frequency energy distribution.

The time required is mainly due to the travel time from the epicenter to the array stations, so we can get the results between 6 to 13 min depending on the epicentral distances. This system can offer fast and robust estimates of source information for large earthquakes, which may be useful for disaster mitigation, such as tsunami evacuation, emergency rescue, and aftershock hazard evaluation.

Figure caption
Figure 1 Framework of the Real Time Back-Projection

キーワード: real time seismology, rupture process, Hi-net, disaster mitigation
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