

Seismic intensity inversion analysis of the earthquake off-shore west of Fukuoka prefecture and its application to an early warning system and earthquake damage assessment

Katsuhisa Kanda[1]; Masayuki Takemura[1]

[1] Kobori Reserch Complex, Kajima corp.

The inversion analysis using seismic intensity data can evaluate the distribution of short-period energy radiated from an assumed fault plane. Since seismic intensity data can be estimated from damage data recorded in old documents, the present method is efficient for the analysis of historical earthquakes. Since various fault parameters as used for waveform inversion analysis are not necessary for the present method, the outline of fault characteristics related to short-period seismic wave may be identified if only wide source zone is modeled as a fault plane. The inversion analysis may be employed even when detailed information is not available just after the event. Furthermore, the forward analysis is implemented based on the obtained short-period energy distribution to estimate seismic intensity at an arbitrary point. The procedure may be applied to an early warning system and earthquake damage assessment.

We applied the seismic intensity inversion analysis to the earthquake off-shore west of Fukuoka prefecture on March 20, 2005 and evaluated short-period radiation zone in the source area. The attenuation formula of seismic intensity and the site correction intensity parameter at each intensity observation point are estimated based on the analysis of the aftershock. Furthermore, the seismic intensity distribution is estimated by the forward analysis in the case of the rupture of the Kego fault running from Fukuoka city to the southeast extension of the aftershock region, assuming the short-period energy distribution on the Kego fault. It is useful to earthquake disaster prevention.