

Rupture area of M5.6 earthquake off Iwaki on October 22, 2005 estimated from seismic waveform inversion

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An interplate earthquake occurred off Iwaki, NE Japan on October 22, 2005. Magnitude and focal depth of this event are 5.6 and 52km, respectively. In this region, Hasegawa *et al.* (2005) found a group of earthquakes occurring with the mean recurrence interval of 8.49 +/- 2.10 years and the average magnitude of 5.70 +/- 0.16. The last event of this earthquake group occurred on May 12, 1997 and the magnitude of this event was 5.5. Since the 2005 event occurred about eight years after the 1997 event and the magnitude of the 2005 event is almost the same as that of the 1997 event, the 2005 event can be thought as one of the earthquakes pointed out by Hasegawa *et al.* (2005). In this study, we estimated rupture areas of the 2005 event and the 1997 event and discuss the relationship between these two events.

We used the same waveform inversion method as Okada *et al.* (2003): the multiple time window method (Hartzell and Heaton, 1983) and the empirical Green's function technique. An event on September 11, 2005 with magnitude of 4.5 near the hypocenter of the 2005 event was selected as the empirical Green's function. Data used in this study are from K-net. We used the 1-D seismic velocity model proposed by Hasegawa *et al.* (1978) in calculating the travel times.

Spatial extent of rupture area of the 2005 event is estimated to be about 2km x 2km and large slipped area is located deeper than the hypocenter. Spatial extent of rupture area of the 1997 event is estimated to be about 2km x 2km and large slipped area is also located deeper than the hypocenter.