

Comparison of source areas between the M4.8 earthquake on January 11, 2008 and the previous two earthquakes off Kamaishi, NE Japan

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Matsuzawa *et al.* (1999) found small earthquakes of M4.8 +/- 0.1 regularly occurring on the plate boundary off Kamaishi and estimated that the mean recurrence interval were 5.35 +/- 0.53 years. They expected that the next event would occur by the end of November 2001 with 99% probability and actually the event occurred on November 13, 2001 (Matsuzawa *et al.*, 2002). Okada *et al.* (2003) compared the rupture areas of the 2001 event with that of the 1995 event by a waveform inversion method and found that the rupture area of the 2001 event almost completely overlapped with that of the 1995 event. They concluded that the 1995 and 2001 events were caused by the repeating ruptures of the same asperity.

Moreover, Matsuzawa *et al.* (2002) renewed the average interval as 5.52 +/- 0.68 years after the 2001 event and expected that the next event would occur in May 2007 +/- 21 months. On January 11, 2008 an earthquake occurred off Kamaishi and this event can be thought as one of the repeating earthquakes occurring off Kamaishi. In this study, we investigate the rupture area of the 2008 event and discuss the relation between the 2008 event and repeating earthquakes off Kamaishi by comparing with that of previous events: the 2001 and 1995 events.

In this study, we estimated spatial extent of the rupture area of the 2008 event by utilizing the same waveform inversion method as Okada *et al.* (2003). In the inversion, we used the multiple time window method (Hartzell and Heaton, 1983) and the empirical Green's function technique. An event which occurred on August 17, 2001 close to those events was selected as the empirical Green's function following Okada *et al.* (2003).

The rupture area estimated in this study almost completely overlaps with those of previous two (2001 and 1995) events. From this result, we can interpret that the 2008 event was caused by the repeating slip on the same asperity as the 2001 and 1995 events.