

## Kuril Island earthquakes viewing from strainmeters

# Yasuhiro Yoshida[1]

[1] MRI

Off Simushir island, belongs to Kuril islands, earthquake which occurred on 2006/11/15 ( $M_s 7.8$ ,  $M_w 8.3$ ) is a thrust type event. Tsunami came to Japanese coast with the maximum height of 80cm. On 2007/01/13, almost the same scale earthquake occurred near the previous event, but the focal mechanism is different (normal fault). The depths of these events were estimated by PDE as 27.7km for 2006 event and 12km for 2007 event. The tsunami height of 2007 event is higher than the that of 2006 event. The cause of the difference of these events is studied using volumetric strainmeters and multi-components strainmeters.

The same technique used in the analysis of Sumatra-Andaman earthquake in 2004 ( $M_w 9.0$ ) [Yoshida, 2006] is used. The data of volumetric strainmeters (LP channels) and multi-components (Ishii-type) strainmeters deployed by JMA in Tokai and Southern Kanto area are used. The sampling interval is 1sec. The arrival direction is estimated with 5 multi-components strainmeters. The direction of P-wave particle motion is used in the estimation of arrival direction. The arrival direction obtained by the raw data is scattered, so I use the filtered data (lowpass filtered: 50sec). The obtained direction is almost 40deg (measured clockwise from north) for most of the stations. Multi-components strainmeters has 4 components for redundancy. The error of arrival direction was estimated to be about 3deg, comparing combination of 3 components results. The back-azimuth of these events is 40 - 45deg which almost coincided with the estimated results.

Source time function (STF) is derived by the deconvolution. Green functions were calculated with the summation of normal modes of the earth whose period are longer than 32sec. The mechanism was fixed to the CMT solution obtained by Harvard group. Bandpass-filter (330 - 40sec) was applied to both observed data and synthetics. Deconvolution was performed for each station and the STF is calculated by the average of them. The duration of STF for 2007 event is about 50sec. The variance of STFs is small, and the seismic moment is estimated to be  $1.9 \times 10^{21} \text{Nm}$  ( $M_w 8.1$ ). The STF for 2006 event is more complex than that for 2006 event and the duration is longer (about 100sec). The variance is large. This might be because of the error of assumed mechanism and depth of events and the effect of lateral heterogeneity of the earth. The seismic moment is estimated to be  $1.8 \times 10^{21} \text{Nm}$  ( $M_w 8.1$ ).

The scale of these events found to be almost the same. But the shape of STF is different. The STF for 2006 event has longer duration and more complex shape. This might affects the tsunami height difference for these events.