

## Tsunami source model of the largest foreshock on March 9th of the 2011 Tohoku-Oki earthquake

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We calculated the fault model of the largest foreshock (Mjma 7.3) on March 9th of the 2011 Tohoku-Oki earthquake. When the foreshock occurred, we installed eight ocean bottom pressure gauges (OBPs) around the epicenter, which mainly recorded the tsunami and the seafloor deformation. The observed tsunami amplitudes and amounts of seafloor vertical movements were up to 15 cm and 10 cm, respectively. Since the location of the foreshock was close to the hypocenter of the M-9 mainshock, an estimation of the spatial extent of the foreshock rupture must be important to understand the generation process of the Tohoku earthquake.

We assumed a planer rectangle fault with constant slip and sought the tsunami source model explaining the waveforms observed by our OBPs. As a result of preliminary forward modeling, a pure reverse faulting in a rectangle of 30 x 50 km along the plate boundary explained the observed waveforms reasonably well. The location of the fault almost coincides with the large coseismic slip area estimated by seismic observations (Shao et al., 2011, GRL). The amount of slip of our source model is 1.4 m, and the seismic moment of our tsunami source model is  $8.3 \times 10^{19}$  Nm, equivalent to Mw 7.2.

We will estimate the fault model from tsunami waveform inversion, and compare it with the rectangle fault plane.

Keywords: Tsunami, The 2011 off the Pacific coast of Tohoku earthquake, Fault model, Ocean bottom pressure gauges, The largest foreshock