

## Analysis of a tsunami generated by the Noto earthquake of 25 March, 2007

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A large earthquake, M6.9, occurred in the north-west of Noto peninsula. The earthquake was an intraplate event occurred within the upper plate. A part of the fault ruptured by the earthquake was located in the Japan Sea, so the earthquake generated the small tsunami observed at some tide gauge stations along the Japan sea coast. At Noto tide gauge station, the first tsunami wave (peak-to-trough amplitude of 14cm) arrived about 40 minutes after the origin time of the earthquake.

In this paper, we computed the tsunami using the fault model estimated by the Geographical Survey Institute (<http://www.gsi.go.jp/BOUS>). The fault length and fault width were 21 km and 14 km, respectively. The fault plane was a thrust type with a significant strike-slip component (strike 55 degree, dip 63 degree, and rake 137 degree). The slip amount was estimated to be 1.5 m by comparing the observed first tsunami amplitude at Noto tide gauge station with the computed first tsunami. This result is consistent with the slip, 1.65 m, estimated by the Geographical Survey Institute using the GPS data. By assuming the rigidity of  $3 \times 10^{21}$  Nm/s<sup>2</sup> for this shallow earthquake, the seismic moment is calculated to be  $1.3 \times 10^{19}$  Nm (Mw6.7). The result is also consistent with the seismic moment,  $1.44 \times 10^{19}$  Nm, estimated using the teleseismic body-wave data by Yamanaka ([http://www.eri.u-tokyo.ac.jp/sanchu/Seismo\\_Note/2007/EIC185.html](http://www.eri.u-tokyo.ac.jp/sanchu/Seismo_Note/2007/EIC185.html)).

Another important observation for this tsunami was the larger later tsunami observed at Noto tide gauge station about 70-80 minutes after the origin time of the earthquake. The numerical simulation of the tsunami clearly showed that the generation of the larger later tsunami was due to the shallow water bathymetry around the Noto peninsula.