

# Fault Model of 2004 Off Sumatra Earthquake, Indonesia based on Satellite Images

# Hisashi Suito[1]; Mikio Tobita[1]; Tetsuro Imakiire[1]; Masaru Kaidzu[1]

[1] GSI

Huge earthquake with moment magnitude 9.0 occurred at off Sumatra Island, Indonesia on December 26, 2004. Huge tsunami was also generated with the occurrence of the huge earthquake and the damage became greatly serious. Many researchers report the numerical simulation of tsunami through the web site. However, there is no fault model based on the crustal deformations, because there is no enough observation data to estimate the fault model. In this presentation, we report the fault model of 2004 off Sumatra earthquake based on uplift and subsidence distribution from satellite images reported by Tobita et al. (this meeting) and some web sites. This fault model may be modified from now on because progress of the analysis of satellite images or the situation of crustal deformation becomes clear in the future.

In order to estimate the fault model, we refer to following uplift and subsidence distribution at 3 regions reported by Tobita et al. (this meeting) and some web sites. 1. Uplift at almost whole Andaman Islands. 2. Subsidence at Nicobar Islands. 3. Subsidence at southwest coast of northwest part of the Sumatra Island, but not so much subsidence at inland or north coast of northwest part of the Sumatra Island.

We assumed 5 sub-fault referred to fault model used for numerical simulation of tsunami which reported by JAMSTEC through the web site. And then, we fixed fault location (Latitude and longitude), strike, dip, rake, length and width referred to uplift and subsidence distribution from analysis of satellite images and EIC Seismology Notes, No. 161. Finally, we fixed amount of slip for each sub-fault based on the amount of moment release estimated from seismic wave analysis (EIC Seismology Notes, No. 161).

In order to explain the observed subsidence at northern part of the Sumatra Island and uplift at Andaman Islands, the total length of the fault is 1300km and 100-120km width. Compared to the fault model used for numerical simulation of tsunami reported by JAMSTEC, our results showed that the fault planes at northern part of the Sumatra Island (fault 1), southern Nicobar Island (fault 2) and Andaman Island (fault 5) is located much close to inland area. The fault planes at north part of Nicobar Island (fault 3) and south part of the Andaman Island (fault 4) is located almost same location as JAMSTEC's model.

Total length of fault is 1300km, width 100-120k, slip 6-12m, dip 8 degree, and rake 90-110. Fault 1: Length 350 km from Simeulue Island to north part of the Sumatra Island, Width 120 km, Strike 330 degree and Slip 12m. Fault 2: Length 200km from north part of the Sumatra Island to Great Nicobar Island, Width 120km, Strike 325 degree and Slip 6m. Fault 3: Length 300km from Great Nicobar Island to Ten Degree Strait, Width 100km, Strike 340 degree and Slip 9m. Fault 4: Length 150 km from Ten Degree Strait to Little Andaman Island, Width 120km, Strike 5 degree and Slip 8m. Fault 5: Length 300km from Little Andaman Island to North Andaman Island, Width 120km, Strike 15 degree and Slip 8m.