

# Aftershock Distribution and the Mainshock's Fault Plane by the MJHD Method: Application to April 6, 2010 Northern Sumatra, Indonesia Earthquake

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## Northern Sumatra, Indonesia

Origin Time (USGS): April 6, 2010 at 22:15:02 UTC

Hypocenter (USGS): 2.360°N, 97.132°E, 31 km (depth)

Magnitude (Global CMT):  $M_w = 7.8$

**Data:** 'Latest Earthquakes in the World - Past 7 days' by the US Geological Survey

**Events Relocated:** Mainshock and aftershocks until April 8, 05h00m

**Method:** Modified Joint Hypocenter Determination (MJHD) by Hurukawa and Imoto

**Results:** Length of aftershock area: 45 km

Width of aftershock area: 50 km

Fault plane: Nodal plane striking NW-SE, dipping NE gently

**Comments:** This is an interplate earthquake between the overriding Eurasian Plate and the subducting Australian Plate. The rupture initiated at the bottom of the fault plane.

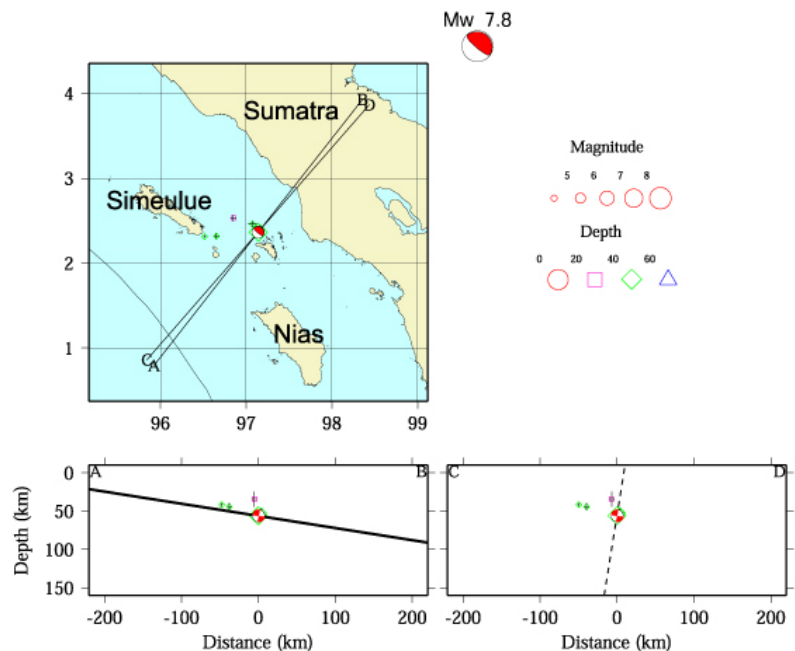


Figure 1. Hypocenters relocated by the MJHD method. Global CMT solution is also shown. Epicentral distribution and two vertical cross sections along A-B and C-D lines, which are perpendicular to strikes of the two nodal planes, are shown. Two nodal planes are shown by lines in cross sections. The nodal plane corresponding to the fault plane is shown by a thick solid line in the A-B cross section.

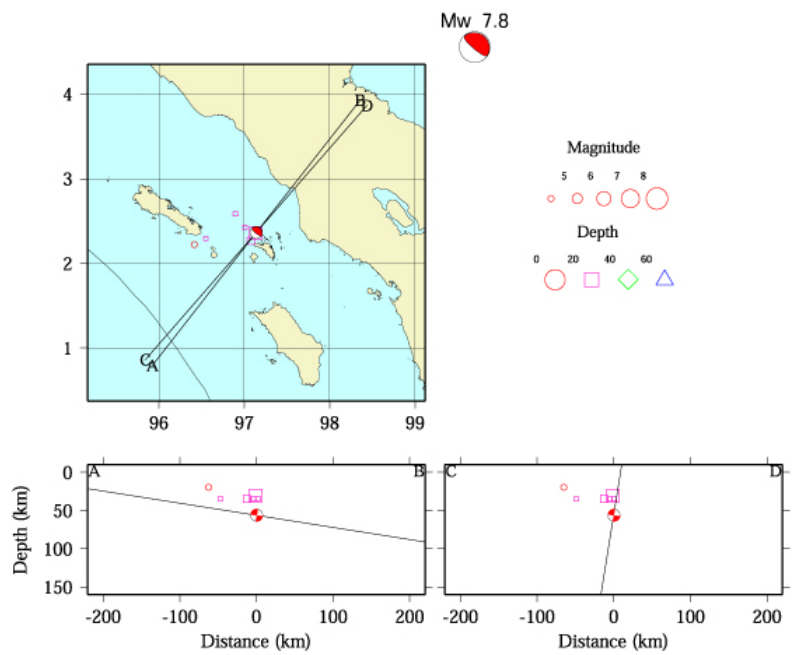


Figure 2. Hypocenters located by the USGS. Two nodal planes are also shown by solid lines in cross sections.

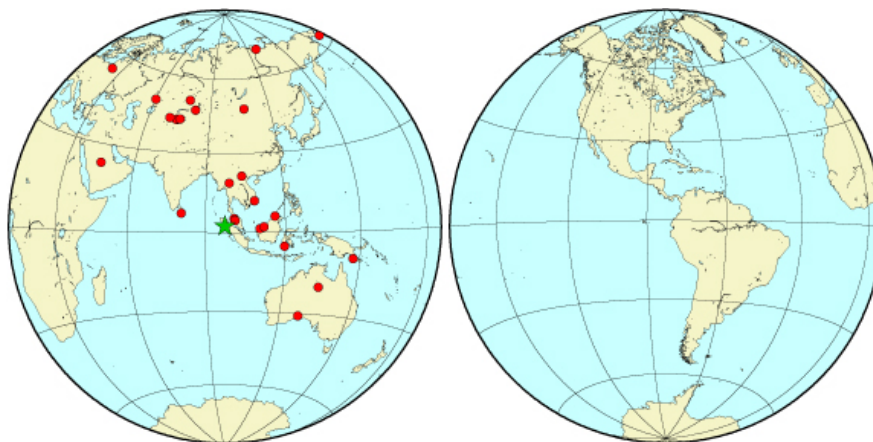


Figure 3. Stations used in relocation.

## References

- Hurukawa, N., Quick aftershock relocation of the 1994 Shikotan earthquake and its fault planes, *Geophys. Res. Lett.*, 22, 3159-3162, 1995.
- Hurukawa, N. and M. Imoto, Subducting oceanic crusts of the Philippine Sea and Pacific plates and weak-zone-normal compression in the Kanto district, Japan, *Geophys. J. Int.*, 109, 639-652, 1992.