

Aftershock Distribution and the Mainshock's Fault Plane by the MJHD Method: Application to February 27, 2010 Offshore Maule, Chile Earthquake

2010/3/1

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Origin Time (USGS): February 27, 2010 at 06:34:14 UTC

Hypocenter (USGS): 35.846°S, 72.719°W, 35 km

Magnitude (Global CMT): $M_w = 8.8$

Data: 'Latest Earthquakes M5.0+ in the World - Past 7 days'
by the US Geological Survey

Events Relocated: Mainshock and aftershocks until February 27 12h00m

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

Results: Length of aftershock area: 640 km

Width of aftershock area: 170 km

Fault plane: Nodal plane striking NNE-SSW, dipping ESE gently

Comments: This is an interplate earthquake between the overriding South American Plate and the subducting Nazca Plate. The rupture propagated both NNE and SSW directions. The length of the fault may be 500-600 km.

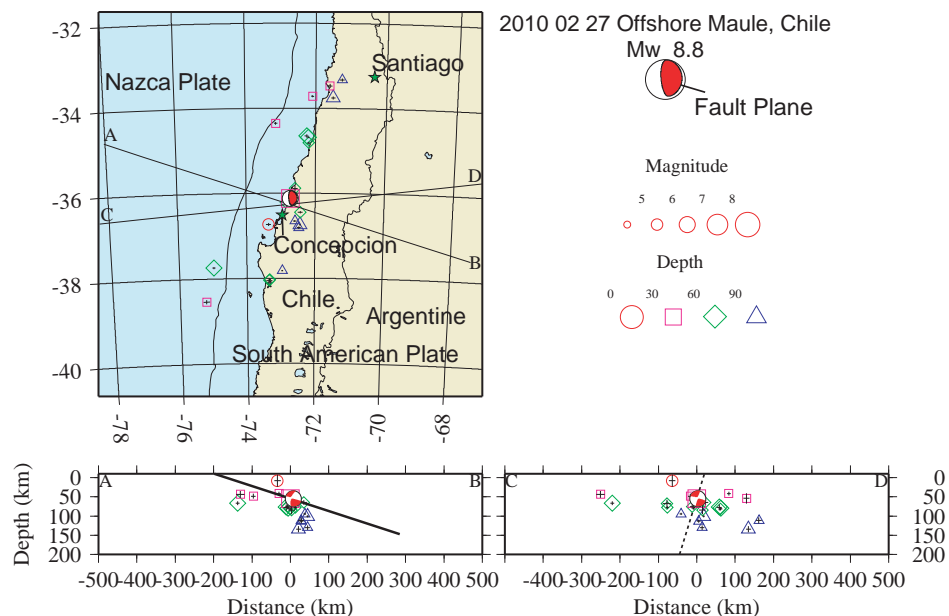


Figure 1. Hypocenters relocated by the MJHD method. Global CMT solution is also shown. Epicentral distribution and two vertical cross sections along A-B and C-D lines, which are perpendicular to strikes of the two nodal planes, are shown. Two nodal planes are shown by lines in cross sections. The nodal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

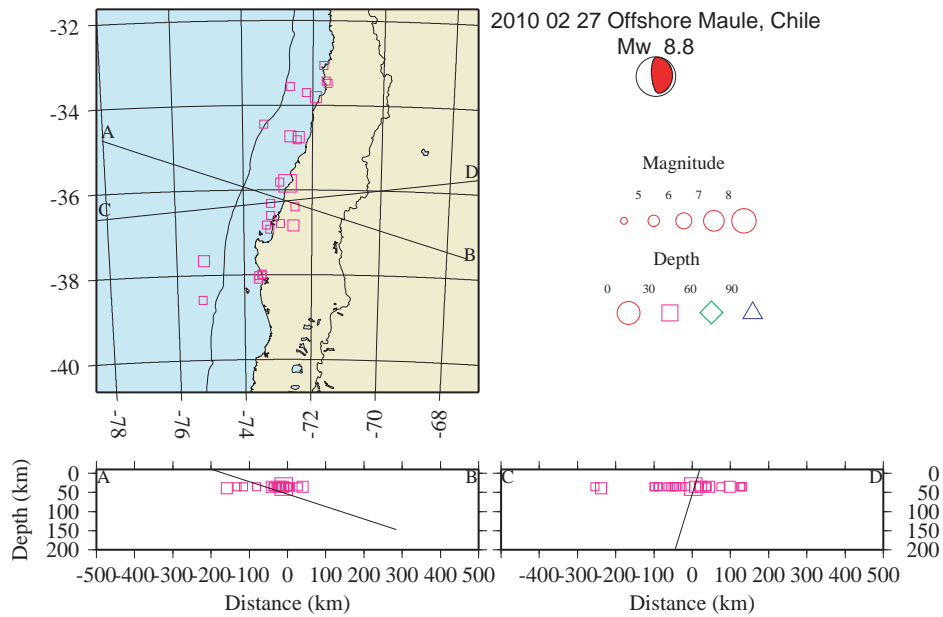


Figure 2. Hypocenters located by USGS. Two nodal planes are also shown by solid lines in cross sections.

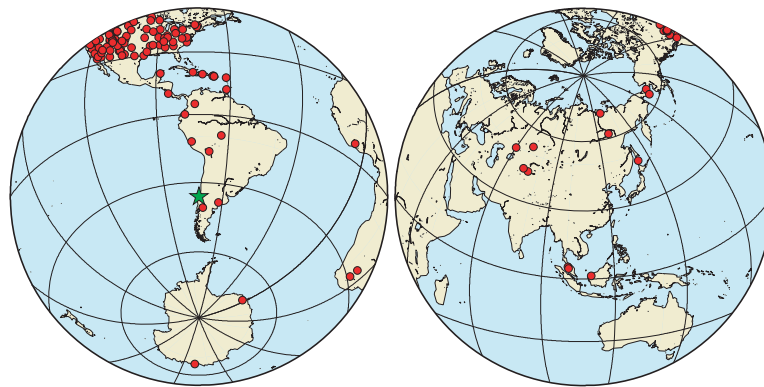


Figure 3. Stations used in relocation.

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.