

Source process of an east-Mino earthquake (12/14/2011; M5.6) in Gifu prefecture, Japan

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An east-Mino earthquake (12/14/2011; M5.6) occurred in the Philippine Sea slab (PHS) beneath the Mizunami city, Gifu prefecture, Japan. The Tono Research Institute of Earthquake Science (TRIES) has deployed about 60 seismic stations above the hypocenter of the earthquake. We relocated hypocenters of the earthquake and 14 aftershocks, and estimated focal mechanisms by the TRIES seismic network and the High Sensitivity Seismograph Network Japan (Hi-net).

The east-Mino earthquake occurred at 49 km depth which appears to be about 9km beneath the upper surface of the PHS. Aftershocks occurred along an east-dip rupture plane of the mainshock. Focal mechanisms featured normal faults as a fault's type with the T-axis to the E-W (margin-parallel) direction and the P-axis to the slab-normal direction. Upper surface of the PHS seems to be convex downward in this region. These features suggest that compression to the slab normal direction and extension to the margin-parallel direction are dominant in the PHS. The PHS seems to contact with a mantle wedge in this region. Cause of the vertical compression in the PHS has remained controversial.

Keywords: the Philippine Sea plate, slab earthquake, focal mechanism, hypocenter distribution, fault plane, stress field