

Spatial variation of seismogenic stress field in the source region of the 2004 Sumatra - Andaman Earthquake

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We discuss spatio - temporal variation of seismogenic stress field in the source region of the 2004 Sumatra - Andaman earthquake. Harvard centroid moment tensor (HCMT) solutions in the Sumatra-Andaman region, 200 events before the main shock and 700 aftershocks during 2 years after December 2004, show a great variety of source mechanisms. These aftershocks occur in clusters, whose distribution have changed from those before the main shock. For example, there occurred many reverse fault aftershocks near the trench. They have steeper dip angles than plate boundary surface, and are considered to be either intraplate events of the oceanic plate or those in the accretionary prism. However, due to the lack of near field seismological observation, hypocenters of these events are not precise and, in particular, estimation of hypocenter depths are very poor. Therefore it is difficult to interpret the variation in source mechanisms with respect to the plate boundary processes.

Thus we try relocating hypocenters in the Sumatra-Andaman region in order to investigate spatial variation in the stress field. We used travel time data of the International Seismological Centre (ISC) and applied the modified Joint hypocenter determination (MJHD) method introduced by Hurokawa (1995) for relocation. For the precise determination of the hypocenter depth, we used hypocenters determined by Engdahl (2007) as initial values. These hypocenter data were determined using depth phases and have improved precision for hypocentral depth. We will discuss relocation results of several cluster activities of interest and their tectonic implications.