



Hypocenter relocation of the September 30th 2009 Padang Earthquake using Hypo-DD

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The Sumatran subduction zone has been ruptured by great earthquakes in the 20th century, except the fore arc area of West Sumatra. This condition, which is called seismic gap, shows that there is a potency of great earthquake that will rupture the subduction zone in the fore arc of West Sumatra. In September 30th 2009, an earthquake occurred in the area close to Pariaman and Padang, West Sumatra. However the previous studies considered that this earthquake is not the interplate earthquake in the Indo-Australian and Eurasian plate boundary. This can be shown by seismological data, such as the position of the earthquake relative to the other interplate earthquakes from the seismicity data, and the different fault direction depicted by the focal mechanism. In order to make sure the accurate location of the September 30th 2009 earthquake, we have conducted hypocenter relocation using HypoDD.

The hypocenter relocation was processed by using the HypoDD version 1.0 software (Waldhauser, 2001). We used the whole day earthquake events on September 30th 2009, which were recorded by seismic stations in Indonesia. For comparison, we also conduct this method with same events, but recorded by stations in Sumatra only and in West Sumatra only. These results are also compared with the results from relocation using earthquake events from September 30th to October 3rd 2009. The best result of hypocenter relocation is obtained from the use of the stations that are only in West Sumatra. Our result is closer to the BMKG (The Meteorological, Climatological and Geophysical Agency of Indonesia) earthquake location.

In addition, we have conducted a deformation analysis using the Harvard focal mechanism and the relocated hypocenter conducted in this study. The result of the surface deformation analysis shows that the direction of tectonic motion is dominantly seaward.