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# GPS observation in Mindanao, Philippines

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The Philippine archipelago is currently wedged between two opposing subduction zones. The Eurasian plate is being subducted eastward along the Manila Trench on the western side while the Philippine Sea plate (PHS) is undergoing a westward subduction along the Philippine Trench on the eastern side. Between the trenches, the Philippine fault, a 1250-km-long, left-lateral strike-slip fault extends NNW parallel to the Philippine archipelago.

In order to mitigate disasters caused by earthquakes occurring along the trenches and the fault, a SATREPS project "Enhancement of Earthquake and Volcano Monitoring and Effective Utilization of Disaster Mitigation Information in the Philippines" was started in 2009.

Under this project, we have started a GPS campaign observation in the eastern region of Mindanao island in order to assessing the potential for earthquakes along the Philippine fault and the Philippine trench in this region.

February 2010, we constructed 15 benchmarks in the region and started observation in March 2010. Each benchmark was occupied for 3-6 days with a dual frequency GPS receiver for 24 hours observation a day with a sampling interval of 30 second, and four campaigns were conducted until March 2013.

Obtained GPS data was processed with Bernese software (ver. 5.0) together with IGS stations data (BAKO in Indonesia, DARW in Australia, PIMO in Philippine, GUAM in Guam, and TCMS in Taiwan) to get daily coordinates in the ITRF2008 reference frame. Velocity of each site is calculated using a least square fitting in the ITRF 2008 and converted to velocities with respect to the Sunda block using the rotation pole estimated by Simon et al. (2007).

As a result in the northern part of the region, we could detected a left-lateral motion of the Philippine fault with 2 cm/year, which is almost the same amount of slip rate of the fault in Msabate Island detected by GPS observation.

In this region, paleoseismic trenches along the fault is also being conducted under the project.

With a view to assess the earthquake potential, we will continue GPS observation and integrate results of paleoseismic studies with present day crust movement.

Keywords: Philippine Trench, Philippine fault, GPS observation, Earthquake potential