フィリピン海プレート北上移動の再構築

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Reconstruction of northward migration of the Philippine Sea Plate

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The West Philippine Basin (WPB) occupies western part of the Philippine Sea Plate (PSP). Its development history has not yet been well understood despite accumulation of studies since 1970s. The origin of WPB was first proposed by Uyeda and Ben Avrahem [1972], which proposed that WPB was formed by entrapment of a segment of the Kula-Pacific Ridge in the middle Eocene. Hilde and Lee [1984] and Jolivet et al. [1989] supported the entrapment model. On the other hand, a backarc origin model of WPB was proposed by Lewis et al. [1982], Seno and Maruyama [1984], and Deschamps and Lallemand [2002]. In their model, WPB underwent clockwise rotation and migrated northward through its development. The plate motion of PSP was also be documented by Haston et al. [1988] and Haston and Fuller [1991], which compiled paleomagnetic data derived from the Palau Islands, Guam and Saipan. They suggested 80 degrees clockwise rotation and northward migration around 20 degrees since the Eocene. Recently, Yamazaki et al. [2010] proposed ˜90 degree clockwise rotation and accompanying northern migration of PSP between 50 and 15Ma. According to their model, northward motion of Palau is small.

In this study, we revisited paleomagnetism of Palau Islands with modern high-precision Ar-Ar geochronology and paleomagnetic experiments. We sampled 2.5 cm-diameter cores using a gasoline-powered drill at 11 sites from basaltic lavas and volcaniclastics. For the paleomagnetic measurement, stepwise AF(0-80mT) and thermal demagnetization (0-600 Celcius degrees) were applied in a magnetically shielded room of the Geological Survey of Japan, AIST.