Plate Boundary Reorganization of the Pacific Plate during Cretaceous

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Several major tectonic events occurred in the Pacific plate during the mid-Cretaceous. A gigantic oceanic plateau was formed around 125 Ma and immediately separated into three plateaus, Ontong Java, Manihiki, and Hikurangi plateaus (Taylor 2006). At approximately the same time, Shatsky Rise ceased to be formed and then Hess Rise started to be formed (e.g. Sager, 2006). These events were accompanied by plate boundary reorganization of the Pacific plate. There are two large troughs in the western Pacific Ocean that are scars of the plate boundary reorganizations of the Cretaceous Pacific plate. One is the Nova-Canton Trough in the western equatorial Pacific Ocean. Taylor (2006) showed that the trough was formed during the separation of Ontong Java and Manihiki plateaus around 125 Ma. The other one is the Hokkaido Trough north of Shatsky Rise. Mammerickx and Sharman (1988) concluded that the trough was the initiation site of a failed oceanic rift which rifting propagated westward along the trough. Norton (2007) proposed another model that the trough is the abandoned Pacific-Izanagi Ridge. The origin of the Hokkaido Trough is still controversial.

The Hokkaido Trough is situated between Kuril Trench and Shatsky Rise. Most of the seafloor around the Hokkaido Trough were formed during the Cretaceous Normal Polarity Superchron (125.93-83.64 Ma), implying little magnetic anomaly lineations are available to reconstruct plate boundaries. Seafloor spreading fabric as abyssal hills and topographic features can give us the information of the reorganization of the mid-Cretaceous Pacific plate. We examined the topographic features around the Hokkaido Trough using multibeam bathymetric data. Most of the multibeam bathymetric data were obtained by the research cruises by R/V *Mirai*, JAMSTEC. The multibeam bathymetric data exposed the detailed topographic expression of the trough and seafloor spreading fabric around the trough. The topographic expression indicates that the Hokkaido Trough is not an abandoned spreading ridge proposed by Norton (2007). We found several curved troughs, which topographic feature is similar to those around the propagating ridges. Our study suggests that the reorganization of the Pacific-Izanagi ridge and fragmentation of the Pacific plate.

Keywords: abyssal hill fabric, fracture zone, Hokkaido Trough, Pacific Plate, Cretaceous