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Zoom meeting A ：11/4 AM1 (9:00-10:30)
9:00〜9:15

Near-seafloor magnetic anomaly reveals geomagnetic field fluctuation during 29?33 Myr

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Knowledge of the Earth's magnetic field intensity variations has been obtained through a record of archaeomagnetic and volcanic materials, and sedimentary sequences. Although geomagnetic field intensity signal recorded as the oceanic crust should provide higher and longer time-resolution continuous record (e.g., Gee et al., 2000), available data is essentially limited due to observation difficulty. Here, we present new observation data of near-seafloor magnetic anomalies of 29-33 Myr seafloor at the Southeast Indian Ridge. We conducted a deep-tow operation during the R/V Hakuho-maru cruise of KH-20-1. Deep-sea total magnetic fields were measured using the deep-tow cesium magnetometer developed by AORI, The University of Tokyo. The sensor reached ˜4,500m deep. The total length of obtained data at $>$3,000m deep is up to 40 miles. Collected near-seafloor magnetic anomaly ranges 60,700 to 62,300 nT, which provides variation three times larger than the total intensity variation simultaneously observed at sea-surface. Long-wavelength signatures are well correlated with each other. Considering continuous surface magnetic data from 0-age ridge axis and geomagnetic polarity chrons (e.g., Gee and Kent, 2015), we individually picked magnetic isochrons of C11n12n, C11r, C12n, and C12r from obtained near-seafloor magnetic anomalies. Several tiny wiggles with an amplitude of up to 300 nT are remarkably observed in C12r. This result is generally consistent with summarized cryptochrons (Cande and Kent, 1992; Cande and Kent, 1995). A few tiny wiggles with an amplitude of up to 200 nT were also observed in C12n, which have never been reported in magnetic anomaly data. This variation is well correlated with records from sediment of Pacific equatorial zone (Yamazaki et al., 2013; Yamamoto et al., 2013), and lava flow of the Lima Limo section of the Ethiopian trap (Ahn et al., 2021; Yoshimura et al., 2020). Our results clearly demonstrate that southern Indian oceanic crust well recorded paleo-geomagnetic field intensity during early Oligocene concurrently with Ethiopian lava and Pacific sediment.