Geomagnetic records over the last 780 kyr obtained by a submersible magnetometer at the Central Indian Ridge, 19S.

Mitsuko Kitazawa[1], Jerome Dyment[2], Miho Asada[3], Kensaku Tamaki[4], Christophe Hemond[5]

[1] Earth & Planetary Sci., Univ. of Tokyo ORI, [2] CNRS UMR 6538,IUEM,UBO, [3] O.R.I.,University of Tokyo, [4] ORI,Univ of Tokyo, [5] Univ. Brest

Among the World ocean ridge system, the Indian Ocean spreading centres are poorly studied by direct observations. In May-June 2000, the French manned submersible NAUTILE dived for the first time in the Indian Ocean at 19 deg. S during the GIMNAUT (Geochronology, ridge-hotspot Interaction, Magnetic with NAUTile) cruise onboard the R/V L'Atalante. It was the second time that this type of equipment was used in this ocean. The study area was focused on the Central Indian Ridge (CIR) near the Rodriguez ridge at 19 deg. S.

A 40 km-long magnetic transect of the CIR was obtained by compiling data from 9 dives. It reaches the Brunhes-Matuyama magnetic boundaries (about 780 kyr) of the both flanks. The vector magnetic field have measured successfully with the Deep-Sea Three Components Magnetometer (DSTCM) developed by the Ocean Research Institute, University of Tokyo. As the DSTCM is located onboard the Nautile, the measured magnetic field includes the Earth's magnetic field and the magnetic field induced by the Nautile. Magnetic data were corrected in order to remove the effect due to the submersible. Observed magnetic anomalies were obtained by subtracting the values of the IGRF 2000 to the observed magnetic field. Synthetic magnetic anomalies were calculated by assuming that the magnetic layer is formed by a 500 m-layer with a magnetization of 1 A/m. These calculated anomalies are proportional to the topography. In order to correct the influence of topography on the magnetic anomalies profiles, the magnetization of the ocean crust were calculated. The magnetic intensity profile was compared to the record from stacked sediments (Guyodo et al, 1999). Main magnetic events, such as Laschamps, Blake, Delta were recognized. Interpretations of those results suggest that the ocean crust is a high recorder of the geomagnetic field fluctuation. The good correlation between both records suggests that tiny wiggles have an origin in the geomagnetic field variations. The comparison of the distribution of the magnetic events from the Western and Eastern flanks suggests that the spreading at this area is highly symmetric.