Paleomagnetic and rock-magnetic studies of sediment cores from Kuroshio extension region and Kuroshio-Oyashio transitional region

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The Kuroshio current plays a major role as a transporter of heat from low latitude to mid latitude. It is important to reconstruct the past change of its strength and path, because it should have affected the paleoenvironmental change in the northwestern Pacific region. Recent studies around the present Kuroshio extension region have revealed latitudinal zonation of sediment facies, which reflects whether the transporter of sediment is Kuroshio or Oyashio. The zonation infers that change of pathes of Kuroshio and Oyashio may recorded as appearance of multiple sediment faces within a core from the location where Kuroshio and Oyashio meet. We have performed sediment corings at such locations during the R/V Mirai cruise MR02-K03 and the R/V Kairei cruise KR02-15, and we are conducting paleomagnetic and rock-magnetic analyses of recovered sediment cores.

The core MR02-K03 PC-2 is located in the present Kuroshio-Oyashio transitional region (36-00N, 146-30E). Normal paleomagnetic inclination throughout the core, which indicates that the core does not reach to Brunhes/Matuyama boundary (780 ka), was obtained.

In order to construct a detailed chronology of this core, we attempted an estimation of relative paleointensity by means of NRM/ARM ratio. The features of NRM/ARM profile is generally consisitent with that of SINT800 paleointensity stack since 320 ka. Relative paleointensity chronology revealed that sedimentation rate of the core is not constant: sedimentation rate in glacial period is about 10 cm/kyr, which is twice as high as that in interglacial period (about 5 cm/kyr).

Though difference in rock-magnetic characteristics between glacial and interglacial sediment has not been found yet, difference in sediment properties were observed in color reflectance. Especially, L* of interglacial sediment is obviously higher than L* of glacial sediment. The visual characteristics of the core MR02-K03 PC-2 is basically in common with those of cores under Oyashio, but low sedimentation rate and high L* of interglacial sediment has a certain similarity to the sediment from the Kuroshio extension region. We presume that the core is less influenced by Oyashio during interglacial.

The paleomagnetic and rock-magnetic results of the other cores, including MR02-K03 PC-1 (29-21N, 146-00E), KR02-15 PC-2B (34-29N, 146-30N) and PC-3 (33-54N, 152-28E), will be presented at the session.