Preliminary report on sedimentary structure and magnetostratigraphy of IODP Site U1490

*Yuho Kumagai[1], Norihiro Nakamura[2], Robert George Hatfield[3], Toshitsugu Yamazaki[4], Yuhji Yamamoto[5], Expedition 363 Scientists

1. Department of Earth Science, Tohoku University, 2. Institute for Excellence in Higher Education, Tohoku University, 3. College of Earth, Ocean, and Atmospheric Sciences, Oregon State University, 4. Atmosphere and Ocean Research Institute, The University of Tokyo, 5. Center for Advanced Marine Core Research, Kochi University

The scientific objectives of International Ocean Discovery Program (IODP) Expedition 363 were to study regional and global climate variability across the Western Pacific Warm Pool (WPWP) from the middle Miocene to late Pleistocene. IODP Site U1490 (05˚48.95´N, 142˚39.27´E, 2341 meters water depth) is located on the northern edge of the Eauripik Rise and was cored to 270 m. The recovered pelagic sediments consist of calcareous and siliceous nannofossils with varying proportions of clay and ash. Seismic reflection data reveal a series of relict current-controlled mud waves that decrease in amplitude up-section shallower than a depth of 180 m. Formation of the present-day WPWP deep water masses in polar downwelling regions enriches them in dissolved oxygen. The presence of well oxygenated water masses at the location of Site U1490 helps to preserve ferrimagnetic minerals in the mudwaves. Shipboard analysis revealed that magnetic minerals between ~25 and 180 meters composite depth (mcd) had been altered by diagenesis and the paleomagnetic data were uninterpretable. However, in the upper ~25 mcd and below ~180 mcd, sediments display stable magnetization that spans from the present to early Pleistocene (0–1.9 Ma) and from the middle to late Miocene period (~9–19 Ma), respectively. The latter is an exceptionally long and continuous sediment sequence that provides an opportunity examine long-term variations of the paleomagnetic field. Here we develop a preliminary magnetostratigraphy for Site U1490 using the natural remanent magnetization (NRM) made on U-channel samples with stepwise alternate-field (AF) demagnetization in peak fields of 20–80mT. We improve the shipboard record by identifying two more reversals in the declination data after 20 mT AF demagnetization. Future work includes the measurement of anhysteretic remanent magnetization (ARM) and isothermal remanent magnetization (IRM) to estimate relative paleointensity and characterize rock magnetic variability.

Keywords: Magnetostratigraphy, IODP Expedition 363

