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Shipboard paleomagnetic results from IODP Expedition 330 (Louisville Seamount Trail): an overview

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One of the primary objectives of the IODP Expedition 330 was to retrieve cores of a sufficient number of volcanic rock units (lavas and volcaniclastics) at each target seamount of the Louisville Seamount Trail to precisely determine the late Cretaceous to early Paleogene (about 80 to 50 Ma) paleolatitude of the Louisville hotspot. Cores composed mainly of various lithologies of volcanic edifices and shallow marine sediments were retrieved from 6 sites (U1372 to U1377) at 5 seamounts of the trail. Detailed paleomagnetic and rock magnetic investigations for discrete samples currently being undertaken at onshore laboratories will provide data that constrain the hotspot paleolatitude. Onboard the JOIDES Resolution, we carried out magnetic measurements for archive half-cores and discrete samples (8 cc cubes) to obtain preliminary results. The remanent magnetization of archive halves was measured at 2 cm intervals using the automated pass-through DC-SQUID cryogenic rock magnetometer. An integrated in-line AF demagnetizer was used to progressively demagnetize the core. Remanent magnetization directions for each 2 cm measurement were calculated using principal component analysis (PCA) with an automated procedure. Remanent magnetization in discrete samples was measured with a spinner magnetometer. Discrete samples were subjected to stepwise alternating-field or thermal demagnetization. In general, relatively well-defined PCA directions were obtained from archive half-core measurements (for core pieces $>$9 cm in length), and they are consistent with characteristic remanent magnetization directions of discrete samples. Also, the anisotropy of magnetic susceptibility (AMS) was determined for all discrete samples. The shipboard results will be used to calculate preliminary paleolatitude estimates for individual seamounts drilled.

Keywords: IODP, Expedition 330, Louisville Seamount Trail, Louisville hotspot, paleolatitude, paleomagnetism