Magnetostratigraphy of IODP Site U1524A from the Ross Sea, Antarctica

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International Ocean Discovery Program (IODP) Expedition 374 aims at resolving the Ross Sea ice sheet history since the Miocene. Site U1524 is located ~120 km north of the Ross Sea continental shelf edge. Hole U1524A is the longest among all three holes at this site. To reconstruct the magnetostratigraphy, natural remanent magnetization (NRM) and its demagnetization data derived from shipboard measurements of archive-half sections, u-channel samples taken from the top 8 cores and discrete cube samples taken from the other cores are jointly analyzed. Results of u-channel and discrete samples demonstrate that undesired secondary magnetization can usually be removed at 20 mT peak alternating field (AF). The combined dataset provides a reliable and continuous reconstruction of geomagnetic polarity, which dates the bottom of U1524A being deposited before 3.3 Ma ago. Frequency analysis based on this age model reveals that the magnetic susceptibility of U1524A bears 405-kyr and 41-kyr cycles. The 405-kyr component has a close in-phase correlation with the theoretical long eccentricity cycles, while the 41-kyr component has a more complicated relationship with the theoretical obliquity cycles. It indicates that the astronomical influence plays an important role in the sedimentary process at Site U1524.

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