Late Quaternary Paleo- and Environmental Magnetism of International Ocean Discovery Program (IODP) Site U1623

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IODP Exp. 403 drilled sediment cores along the Svalbard Margin, recovering expanded Pleistocene deposits at Sites U1621, U1623, and U1624. The >300 recovered meters at Bellsund Drift Site U1623 contain a high-resolution co-registered record of oceanographic conditions associated with the warm West Spitsbergen Current and paleo-Svalbard-Barents Sea Ice Sheet behavior back to at least 1.1 Ma. Ongoing work is exploring a suite of stratigraphic methods to refine that chronology and identify the expressions of past warm times. Here we present u-channel paleo- and environmental magnetic data spanning the top 11 mcd to assess their potential to study the geomagnetic field behavior at high latitudes, constrain chronology using relative paleointensity (RPI), and study the region's oceanographic and ice sheet history using environmental magnetic methods. Anhysteretic remanent magnetization (ARM) and magnetic susceptibility (k) variations are quite similar to previously published results from a nearby piston core, allowing for correlation to constrain sediment ages back ~30 kyr. The magnetic properties of Site U1623 are distinct in the Holocene, compared to the Pleistocene. Holocene sediments have high k_{ARM}/k values, contain well-defined magnetizations that approximate those expected from a geocentric axial dipole (GAD) field, and display alternating field demagnetization (AFD) properties consistent with an assemblage dominated by magnetite. Late Pleistocene sediments have relatively low k_{ARM}/k values and contain a mix of well-defined magnetizations that demagnetize towards the origin and discrete intervals that acquire gyro-remanent magnetizations during AFD, indicating the presence of greigite. RPI proxies from late Pleistocene sediments are similar to previous work from the drift, indicating this signal is reproducible, but Site U1623 has higher values in the Holocene. NRM after 20 mT AFD normalized by k captures a prominent increasing trend in RPI since 25 ka, like documented in the GLOPIS stack. These results suggest that magnetic approaches may be able to contribute to multi-proxy age models through RPI stratigraphy. Additionally, environmental magnetic approaches may help distinguish interglacial intervals through looking for Holocene-like magnetic properties.