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Rock magnetic properties and sedimentary environments at the western Yermak Plateau slope, Arctic ocean

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The recognition of post-sedimentary alterations of the primary magnetic minerals is becoming an increasingly important issue, since diagenesis can strongly influences the quality of the geomagnetic record in sediments. Here we report new detailed rock magnetic study on four sediment cores from the Yermak Plateau slope (Arctic ocean) which supply evidence for magnetite dissolution related to sub-/anoxic condition within the sediment.

In all cores, black mineral aggregates were found during sampling and did decompose/oxidize within couple of hours when exposed to air. First results from defuse reflectance spectroscopy showed occasional occurrence of pyrite in the sediment. Fe sulfides are common in sub- to anoxic environments where they form in-situ and substitute for dissolved primary ferrimagnetic Fe oxides in intervals with increased amount of organic matter. Organic carbon content, even in the order of 1-2 wt \%, is crucial for the preservation of the primary magnetic minerals.

High organic carbon content due to high biogenic productivity and the interconnected preservation of fresh marine organic matter at the Yermak Plateau are confined to interglacials. During that time intervals, carbonate dissolution has taken place. To explain the carbonate dissolution, previous studies have suggested release of oxygen-rich and saline bottom waters during sea-ice formation. Our new results based on redox sensitive rock magnetic properties, however, imply oxygen depleted conditions, magnetite dissolution and Fe sulfide formation in the sub-surface sediment layers. All these to-

gether raise the possibility for two competing mechanisms, e.g oxic respiration and reductive diagenesis, controlling the environmental settings at sites with high biogenic productivity.