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Pliocene anisotropy of magnetic susceptibility (AMS) from the Wilkes Land margin
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During IODP Expedition 318, Site U1361 was drilled offshore from the Wilkes subglacial basin on the continental rise to reconstruct the stability of the East Antarctic Ice Sheet (EAIS) during Neogene warm periods, such as the late Miocene and the early Pliocene. As the drilled core has a complex story of compaction, erosion (thus hiatuses), unconformities, and possibly artificial disturbance, identifying these is important for reconstructing paleoenvironments. An unconformity, WL-U8, was found at ~100 mbsf during the cruise; this is considered as a results of the transition from a dynamic to a persistent ice sheet. Anisotropy of magnetic susceptibility (AMS) is sensitive to lithological changes and differential compaction. At Site U1361, highly anisotropic layers correspond with lithologic boundaries and hiatuses. During the Pliocene, the degree of anisotropy was controlled by the presence or absence of diatoms as opposed to in the late Miocene. Here we present a detailed study of the relationships between sediment compaction based on AMS fabric and variations in diatom taxa and magnetic mineralogy to identify the remarkable ice retreat and the geological response to the transition of dynamic to persistent ice sheet. There is a clear correlation between degree of anisotropy and moisture content. Where moisture content is high, the layer is more isotropic, and vice versa. Moreover, Layers with the most abundant diatom valve concentration are characterized by more isotropic AMS fabrics. There are also strong rock magnetic indications for changes in the sources of the magnetic minerals above and below the interval of WL-U8 and Miocene to Pliocene transition. We will describe our AMS and rock magnetic stratigraphy to 1) characterize sediments compaction as a function of diatom taxa variation and 2) detect the sources of magnetic mineralogy throughout Miocene to Pliocene.

キーワード: Wilkes Land, Anisotropy of magnetic susceptibility, Pliocene, Miocene
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