

Magnetostratigraphy and rock magnetic characterization of Baltic Sea IODP Expedition 347 Sites M0059 and M0060.

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Abstract: We have studied the rock magnetic and paleomagnetic properties of a ~205 meter-long core from Site M0059 (Little Belt, BSB3) and ~210 meter-long core from Site M0060 (Anholt Loch, BSB1) recovering for the most part clays, (silty) sands, sandy clays and gravel. We deployed 454 (Site M0059) and 297 (site M0060) 8-cc discrete samples at approximately every 50 cm down-core from inside the respective site splices. The magnetic susceptibility (χ) of the total of 751 samples was normalized to sample mass. We also performed stepwise alternating field demagnetization (AF) of the NRM up to a maximum field of 80 mT and the results show that the characteristic remanent magnetization (ChRM) was isolated by weak AF's, typically between 0–25 mT, and that a low field of 5 mT is sufficient to remove a weak viscous remanent magnetization (VRM). After the removal of the VRM overprint the NRM intensity of the two sites is characterized by a general positive relationship with (χ). The inclination data from both sites show positive and negative inclination values with a certain degree of scattering around 0°. For Site M0059 the upper lithologic units show inclinations that vary within 10 degrees either side of the geoaixial dipole prediction for this location. In contrast the inclinations of Site M0060 show large scatter and only a few of the samples from the lower units approach the GAD prediction for this site's location. In contrast, the inclination values in the upper lithologic units are closer to the GAD prediction. Measurements of the temperature dependence of bulk susceptibility (k-T analyses) indicate the presence of at least three magnetic mineral phases, which display characteristic Curie point temperatures of 360-400°C, 520 and 575°C for both sites and an additional Curie temperature of 610°C for Site M0060. The absence of independent time control points at this point in time, however, prevents detailed comparison to the FENNOSTACK regional master curve (Snowball et al. 2007). On the other hand, it may be possible that the interval of steepest inclinations between approximately 18 m and 16 m depth in Site M0060 corresponds to the period

of steep inclination experienced in Fennoscandia between 3090 and 2590 Cal. a BP, which is delimited by inclination features ε and ε^1 , respectively, in FENNOSTACK.

Keywords: Baltic Sea, Magnetostratigraphy, rock magnetic properties

References :

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