



Environmental magnetism and excursion record of the Pleistocene-Holocene transition in marine cores, West Coast South Island, New Zealand

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Homologous ARM susceptibility (κ ARM) and magnetic susceptibility (κ) records from u-channel samples of five short cores (TAN0712 cores 14, 15, 17, 23, 27) record the Pleistocene - Holocene transition off the West Coast of the South Island, New Zealand.

Cores were collected in water depths ranging from 880-2817 m. Cores 14, 15 and 17 are situated along the north levee of Moeraki Canyon. Cores 15 and 17 are kasten cores that record a relatively homogeneous concentration of single domain (SD) grains. Core 14 is a piston core slightly closer to the edge of Moeraki Canyon. From end of core (EOC) at 3.2 m to 0.75 m, the dominance of κ indicates coarse, multi-domain (MD) magnetic grains; however, low κ units (10-20 cms thick) occur at a mean interval of 0.71 m (n=3).

Cores 23 and 27 are situated on the north-west margin of Milford Basin. Variations in magnetic mineral concentration in core 23 occur approximately every 26 cm. Fast Fourier Transform analysis confirms the 26 cm cycle, although it has relatively low spectral power. Core 27 also has a short interval of variable concentration. This variation in 'magnetisability' is inferred to result from fluctuating carbonate concentrations during the glacial period leading up to the Last Glacial Maximum (LGM).

All three longer piston cores (27, 23, 14) contain a coarse MD interval ranging from 0.35-1 m in thickness, which we infer to represent influx of outwash at the termination of the LGM. Overlying this interval, all five cores display a consistent SD signal inferred to represent hemipelagic sedimentation during the Holocene.

Possible geomagnetic excursions are recorded in four of the cores. An inclination transition to 34.2° combined with a 180° declination transition and NRM intensity low at 0.35-0.39 m in core 17 suggests a true geomagnetic excursion. Core 15 also has inclination shallowing and an intensity low at 0.45 m. An older excursion in core 27 at 2.54-2.69 m and in core 14 at ~2.8 m may correlate. The younger excursion may correlate with the younger of the only other known Holocene excursions in this region (dated at 2.5 and 12.5 ka in the Pacific Ocean near Tahiti; IODP 310; Lund, 200, *Eos Transactions AGU* 88(52)). The older excursion, first reported here, is coincident with the termination of the LGM.