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Paleomagnetic directions and intensities across a Middle Miocene geomagnetic reversal sequence recorded in East Iceland

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We sampled 70 Middle Miocene lava flows from flood basalt piles near Neskaupstadur (East Iceland), which provide a quasi-continuous record of geomagnetic field variations. Samples were collected along the Profile B of Watkins and Walker (1977), which was extended about 200 m farther down in a neighbouring stream bed. Published radiometric age determinations range from 12.2 to 12.8 Ma for the sampled sequence. A total of 436 specimens were demagnetized using AF and thermal techniques with an average of 15 steps. Four reversals were recorded in this profile, with 30 transitional lavas found within or between 12 normal and 21 reversed polarity flows. The large amount of transitional lavas and the generally too low VGP latitudes for stable field directions is noteworthy as such features are commonly observed in Icelandic lavas. The reason for this characteristic, geomagnetic origin or tectonic tilts, is scrutinized. The transitional VGPs reveal a far-sidedness. Reversal paths move across the Pacific. Transitions were identified as belonging to C5An.1r - C5Ar.3r based on the Astronomically Tuned Neogene Timescale (Lourens et al., 2004). We selected 130 samples for paleointensity measurements using a modified Thellier method. 103 of the measured samples yielded data of sufficient quality to calculate paleointensities for 33 lava flows. The average paleointensity for stable field directions was 18.89μT, whereas the intensity drops to a minimum of 5.81μT during field transitions. The stable field intensities represent only about one third of the present day field. The “saw-tooth”-theory, which is characterized by a sharp increase of intensity directly after a reversal and then followed by a gradual decrease towards the next reversal, was not found in this study.