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The effects of anisotropic and non-linear TRMs on Thellier-type paleointensity data

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In this study, a recently developed stochastic model of single domain (SD) paleointensity behaviour is expanded to investigate the effects that anisotropic and non-linear thermoremanent magnetizations (TRMs) have on the paleointensity results and the parameters used to select data. The model results indicate that before applying any form of correction these non-ideal factors can produce results that are self-consistent, but highly inaccurate. The methods that are currently used to correct for anisotropic and non-linear TRMs are effective and greatly increase the likelihood of obtaining accurate results. The corrections, however, do not restore the results to those of ideal SD samples measured with the same laboratory-to-ancient field ratio, but the data are restored to those of ideal SD samples with the equivalent laboratory-to-ancient magnetization ratios (M_{Lab}/M_{Anc}). The simulations indicate that non-linear and anisotropic TRM have no or only a weak influence on the parameters commonly used to select paleointensity data, which means that these non-ideal factors are effectively undetectable. Given the high self-consistency and highly inaccurate results that anisotropic and non-linear TRM can yield, it is essential to test for such effects and all Thellier-type paleointensity studies *must* include tests for anisotropic and non-linear TRM to assert the reliability of the data obtained.