

Calibration of relative paleointensity variation to absolute value using paleointensity data from volcanic rocks

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We made a direct comparison between absolute paleointensities obtained from welded tuffs of pyroclastic flows and relative paleointensities (RPIs) from sedimentary records. Widespread tephras extruding with the welded tuffs were identified in sediments and dated in the oxygen isotope stratigraphy. Referring to the age estimates of the tephras in the oxygen isotope stratigraphy, the absolute paleointensities can be compared with RPIs of sedimentary records. For two RPI stack records reported from different oceans, we find that RPIs has a linear correlation to absolute paleointensities. On the basis of the correlations, the RPI variations were calibrated to geomagnetic field strengths (virtual axial dipole moments: VADM). The two calibrated records show an almost consistent VADM variation. The consistency indicates that this new calibration procedure is successful and it can be applicable to RPI records on the Earth.

Keywords: relative paleointensity, absolute paleointensity, welded tuff, tephra, calibration, LTD-DHT Shaw method