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Paleomagnetic Secular Variation as a Regional- to Global-Scale Chronostratigraphic Tool for Paleoclimate Studies

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Paleomagnetic secular variation (PSV) describes the decadal to millennial scale variability of the Earth's magnetic field, both it's direction and intensity. PSV appears to be regionally correlatable and synchronous over $\sim$4000 km spatial scales. Correlations between PSV records can provide isochrons for relative dating or absolute dating when the regional PSV pattern is known and dated. Such regional patterns during the Holocene are now known for more than half the Earth's surface. The correlations can be carried out with individual scalar components (inclination, declination, or intensity alone), but dating, correlation-resolution, and uniqueness improve dramatically when multiple components are correlated together. Within the Holocene, PSV correlations can provide absolute dating resolution of $\sim\pm$50 yrs to $\pm$100 yrs. PSV correlations can be used to markedly improve the accuracy and utility of other absolute dating tools (especially radiocarbon).