



Vagaries of calculating paleosecular variation (S-value): an example from the geomagnetic equator

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Paleosecular variation records enable the quantification of the convective vigour in the Earth's outer core in the past. To ascertain whether changes in this convective behaviour of the geodynamo may have triggered the Cretaceous Normal Superchron, we sampled a 23 million year long marine sedimentary section at the geomagnetic equator. The paleosecular variation of this section, expressed by the S-value, was found to be higher on average than that of the last 5 Myr, and significantly higher than the S-value calculated for the Cretaceous Normal Superchron by McFadden et al. (1991). Our record from the geomagnetic equator represents the baseline S-value for all latitudes. Possible influences of bedding corrections, operator dependent data evaluation, quality of data points and the time window length used for calculation on the S-value were considered. Importantly, we find large variations in S value within the superchron, from 86 to 109 Ma, which explains why previous studies have yielded discrepant values when sampling over more limited time windows.