Inferring Variability from Paleoclimate Time Series

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There exists several methods to estimate the scaling behaviour observed in paleoclimate reconstructions. We present a comparative study of three commonly used methods, namely Detrended Fluctuation Analysis (i.e. DFA), the Haar structure function and the power spectrum, in order to evaluate their strengths and shortcomings. Their ability is tested in recovering the known scaling exponent of synthetic pseudo-proxy time series, and we evaluate the impact of bias ineherent to natural archiving of climate signals such as non-climate noise, and irregular and uneven sampling. The methods are then applied to actual paleoclimate time series from various proxies, and the results compared.