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Half-precession signals in marine an terrestrial records – connecting IODP/ICDP sites from the equatorial Atlantic to Greenland

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The characteristics of half-precession (HP) cycles (~9,000 - 12,000 years) is still poorly understood, despite their appearance in numerous records. We analyse HP signals in a variety of different marine and terrestrial proxy records from Europe and the Atlantic Ocean, investigate the temporal evolution of the HP signal from the early/middle Pleistocene to the present, and evaluate the potential of the HP to reflect the connectivity of climate systems over time.

We apply filters on the datasets that remove the classical orbital cycles (eccentricity, obliquity, precession) and high frequency signals, and focus on the bandwidth of HP signals. Wavelet annalysis and correlation techniques are used to study the evolution of specific frequencies through the different records.

In addition to a connection of HP cycles with interglacials, we observe a more pronounced HP signal in the younger part of several proxy records. Besides, we observe a trend of more pronounced HP signals in low latitude records compared to high latitudes. This is in agreement with the assumption that HP is an equatorial signal and can be transmitted northward via various pathways. The appearance of HP signals in mid- and high-latitude records may thus be an indicator for the intensity of the transporting mechanisms. We suggest that the African Monsoon plays a major role in this context, as its magnitude directly influences the climate systems of the Mediterranean and Southern Europe. In order to better understand the African climate variability, both equatorial marine and terrestrial records will be examined with respect to HP.