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Integrative multivariate study of past African climate variability

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Based on a set of various marine palaeoclimate proxy records, we investigate African climate variations during the past 5 million years. We use a collection of modern approaches from non-linear time series analysis to identify and characterise dynamical regime shifts as changes in signal predictability, regularity, complexity, and higher-order stochastic properties such as multi-stability. We observe notable nonlinear transitions and important climate events in the African palaeoclimate, which can be attributed to phases of intensified Walker circulation, marine isotope stage M2, the onset of northern hemisphere glaciation, and the mid-Pleistocene transition, and relate them to variations of the Earth's orbital parameters.