Geophysical Research Abstracts Vol. 20, EGU2018-4448, 2018 EGU General Assembly 2018 © Author(s) 2018. CC Attribution 4.0 license.



Causality from palaeontological time series

Bjarte Hannisdal

University of Bergen, Department of Earth Science, Bergen, Norway (bjarte.hannisdal@uib.no)

As custodians of deep time, palaeontologists have an obligation to seek the causes and consequences of long-term evolutionary trajectories and the processes of ecosystem assembly and collapse. Building explicit process models on the relevant scales can be fraught with difficulties, and causal inference is typically limited to patterns of association. Here I discuss some of the ways in which causal connections can be extracted from palaeontological time series and give a brief overview of three recently developed analytical frameworks that have been applied to palaeontological questions, namely linear stochastic differential equations, cross convergent mapping and transfer entropy. I outline how these methods differ conceptually, and in practice, and point to available software. I end by discussing why a paradigm of dynamical causality is needed to decipher the messages encrypted in palaeontological patterns.