Geophysical Research Abstracts
Vol. 18, EGU2016-123, 2016
EGU General Assembly 2016

Analysing spatially extended high-dimensional dynamics by recurrence plots

Norbert Marwan (1), Saskia Foerster (2), and Jürgen Kurths (1)

(1) Potsdam Institute for Climate Impact Research, Transdisciplinary Concepts and Methods, Potsdam, Germany (marwan@pik-potsdam.de), (2) Helmholtz-Zentrum Potsdam Deutsches Geoforschungszentrum (GFZ), Potsdam, Germany

Recurrence plot based measures of complexity are capable tools for characterizing complex dynamics. We show the potential of selected recurrence plot measures for the investigation of even high-dimensional dynamics. We apply this method on spatially extended chaos, such as derived from the Lorenz96 model and show that the recurrence plot based measures can qualitatively characterize typical dynamical properties such as chaotic or periodic dynamics. Moreover, we demonstrate its power by analyzing satellite image time series of vegetation cover with contrasting dynamics as a spatially extended and potentially high-dimensional example from the real world.