Review of a manuscript for *NPG*

Detecting dynamical anomalies in time series from different palaeoclimate proxy archives using windowed recurrence network analysis by J. Lekscha and R. Donner

Overall:

In this manuscript the authors test the suitability of the earlier developed windowed recurrence network analysis (wRNA) for detecting dynamical anomalies in paleoclimate proxy times series. The method skills are tested on the suite of stationary and nonstationary timeseries of forward modelled pseudoproxies with known dynamical properties. This work is a natural continuation/extension of the earlier studies of the group on the application of networks to the analysis of (paleo)climatic data

The paper is clearly written and results are well presented. I therefore consider the manuscript deserves to be published after some very minor modifications /additions to the content if the authors/editor finds them relevant.

Minor comments

Page 3 Line 59: "for estimating embedding delay…autocorrelation function" is it a global or a windowed estimate? Please be specific
Page 3 Line 66: why namely the maximum norm is used? Is it possible to justify the choice? Did the authors check the sensitivity of the results to the use of other norms?
Page 3 Line 71: "…such that a fraction \rho of all possible links in the network is realized": is the threshold global or window-based?
Page 3 Eq. 4 please indicate that |i-j|=|v-i|=1
Page 5-6: forward proxy model for tree rings. One should not that the juvenile growth is not modelled/accounted for in the model used. Hence an effect of its subtraction, which can be substantial, depending on the species used, technique applied and the entire age structure of the tree-ring network (archive) is also discarded. It is worth mentioning in a context of results demonstrated for tree rings.
Page 8 table 2: Please check if the amount of measured foraminifera is correct (number of species? Sample weight?) please indicate units
Page 11: Use of nonstationary Røssler system: How realistic this model actually is for climate applications? Are there any larger-scale climatic processes that can potentially be associated with this model?
Page 12 Line 309: "…respond to temperature rather than to precipitation…" mind that compared with a temperature, precipitation is not reproduced in the models that well, though for this particular case (boreal forest), temperature indeed will be a stronger limiting factor.
Page 13 Line 322: "…closely follow the respective temperature input", note my comment on the used forward proxy model for tree rings. Such a good concistency can partly be attributed to a lack of juvenile growth effect in the model.
Page 17 Line 368: "….lower-dimensional dynamics during the MCA…..higher-dimensional… during the LIA" Can the authors elaborate a bit more on this result? What are the actual features in the analyzed timeseries manifested in wRNA as lower and higher network \Tau?

Page 19 Lines 403-404: Did the authors consider block shuffling of surrogates (same as in block bootstrapping) as a possible method to tackle this problem?