

Reconstructing coupled time series in climate systems using three kinds of machine learning methods

Anonymous Reviewer #2

The authors have answered all the technical queries and modified the manuscript based on the suggestions. However, I feel the authors need to check for English language corrections. I am mentioning some specific ones below:

Specific Points:

Line No. 474-478: The following lines should be written as

“ Chattopadhyay et al. (2019) also suggests that LSTM performs worse than RC in some cases, and this might be related to the use of a simple variant of the LSTM architecture. This variant of LSTM was tested and it was found that the time-varying local mean in time series would sometimes influence its performance. However further investigation is required for a deeper understanding of the same. ”

Line No. 523 - 528: The following lines can be rewritten as:

“However, RC and LSTM are not restrained by the Pearson correlation in this nonlinear system. When θ is altered from 0.7 to 0.3, although the Pearson correlation changed a lot, the values of CCM index stayed consistently above 0.9. Throughout the alterations in θ , RC is able to produce a good quality reconstruction of X1. Fig. 9b shows that the reconstructed series by RC and LSTM always overlap with the real time series. Thus it can be inferred that the performance of both RC and LSTM is sensitive to the value of CCM index. This has been analyzed in section 4.2.2.”

Line No. 47-48: I suggest rewriting this line as:

“For example, chaos is a crucial property of climatic time series (Lorenz, 1963; Patil et al., 2001).”

Line no. 48-50: The following lines can be rewritten as:

“Thus, there is significant concern regarding the ability of machine learning algorithms to reconstruct the temporal dynamics of the underlying complex systems (Pathak et al., 2017; Du et al., 2017; Lu et al., 2018; Carroll, 2018; Watson, 2019).”