

Interactive comment on “On the data-driven inference of modulatory networks in climate science: an application to West African rainfall” by D. L. González II et al.

Anonymous Referee #2

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This manuscript presents a data-driven approach to identify key climate variables/indices that influence a specific climate phenomenon of interest. Using West African summer rainfall variability as a case study, the authors applied three different methods (CHARM, Lasso, and DBN) and examined the consensus among results from the three. The climate variables/indices included in this application were identified based on literature in the domain science. Results from the three data-driven methods, especially the consensus, are largely consistent with known relationships related to precipitation variability in the region. This study demonstrates the usefulness of data mining in discovering and potentially explaining relationships within the complex climate system. The manuscript is very well written, and I found the authors' explanation

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of the data-driven approach very comprehensible for readers/reviewers who are in climate science without much background in data mining/big data. Nevertheless I have the following comments:

- 1) Introduction, related to the known and not-so-well-understood relationships summarized in Figure 1: The authors provided one example. It would be very helpful if a more exhaustive description of these relationships can be included, with references to specific studies. This would help improve the credibility of results from this study for those who are not familiar with this body of literature.
- 2) Section 3: It seems that the figures are not referenced in their order of appearance. Please fix.
- 3) The results showed a large agreement between ARM and Lasso, and the number of relationships identified by DBN is much much smaller. As a result, the consensus among the three is pretty much determined by DBN. What is the implication of this regarding the usefulness of either (ARM & Lasso vs. DBN)?

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