

Interactive comment on “Global biosphere–climate interaction: a multi-scale appraisal of observations and models” by Jeroen Claessen et al.

Anonymous Referee #1

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The authors used the Conditional Spectral Granger Causality framework to evaluate local biosphere – climate interactions at a global scale. This was done at three temporal scales (monthly, seasonally and yearly) and using vegetation dynamics (based on LAI) retrieved from both satellite observations and earth system model data. Overall, I think it is a very interesting and innovative approach. Although the method has a few restrictions, such as the inability to account for off-site effects of vegetation on climate, these are well acknowledged in the discussion.

Comments: 1. The authors could consider to change the title to multi-temporal scales instead of scales as the latter may also refer to spatial scale. 2. Although not in the

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scope of this paper, could the approach be useful to evaluate how the interactions change over time? 3. There is likely an important anthropogenic effect on both vegetation and climate dynamics. Could this impact the obtained results? 4. The interannual impact of climate on vegetation is also very patchy over Africa and North America in contrast to the modeled output (fig 2). Do the authors have an idea why this happens? Is it a methodological issue, data issue or are the drivers of long term trends more spatially heterogeneous (which is not caught by the models). 5. Did the authors try to run the analysis over the same time period for the remote sensing and model data (page 4, line 17)? Do the results substantially differ? 6. The approach includes data outside the growing season to estimate the monthly interactions. Yet, variations in LAI might not be meaningful during this period. Could this potentially affect the results? 7. What is the policy of the authors concerning sharing data/scripts? Are the authors planning to make these available via a repository/upon reasonable request/...?

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