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Earth System Dynamics
Discussions

Interactive comment on "Problems with solar, volcanic, and ENSO attribution using multiple linear regression methods on temperatures from 1979–2012" *by* T. Masters

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I thank the second reviewer, Dr. Nielsen-Gammon, for his many helpful comments and suggestions for improving the clarity and details of the manuscript. As he notes, much of the comments deal with the writing, and I agree that most of these would help improve the readability. For these points I will simply note that I will make the recommended changes in the revised manuscript. The other points/questions I will address below:

1 & 2 – Agreed, will change text.

3. None of the lags reached 10 months. However, I will report these values so the

reader knows this.

4. Thank you, will make the change.

5. The revised manuscript will include additional text discussing this assumption. Additionally, it will investigate further how adding a volcanic / solar scaling term may help in matching the form of the GCM natural-only forced response.

6. The revised version will explicitly calculate relative to the prior 30-year normal, rather than the normal over the entire time series (which is the calculation in the draft).

7. Agreed, will change text.

8. The response time in the EBM is a function of the sensitivity and heat capacity chosen (as is the magnitude of the response). Generally, an increased sensitivity must be damped by an increased heat capacity to keep the short-term response consistent with what is observed for a given forcing, which is why these are adjusted together. Point taken about the "true" response and its relation to the EBM.

9 – 15. Agreed, will make the relevant changes.

16. Yes, I think the member for which we are determining the ENSO signal should be withheld, per your suggestion.

17. That is true. Per my response to the first reviewer, I will also note that the relationship between the proxy and ENSO in the GCM does not necessarily hold true for the real world.

18 – 20. Agreed, will make requested changes.

Re Section 5: Per my comments in response to reviewer 1, this section will require a fuller treatment and likely its own manuscript, so I am planning to remove it for this one and focus strictly on the problems with multiple regressions in the attribution of the various components.

Thank you for the technical comments, which will be integrated into the revised manuscript.

Interactive comment on Earth Syst. Dynam. Discuss., 4, 1065, 2013.