

Interactive comment on “Multi-periodic climate dynamics: spectral analysis of long-term instrumental and proxy temperature records” by H.-J. Lüdecke et al.

Anonymous Referee #2

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In my last comment I have stated that I agree with the remarks made by Mudelsee and that the authors should address these points. Their answers to Modelsees comments are not satisfying. In the following I will repeat the points which I consider to be still addressed:

1. If the journal allows enough space, the authors should include a description of the DFA method used. Of course, the method is described in the literature cited, but I agree with Mudelsee that for readers who are unfamiliar with the method, it may help to describe it directly.
2. If the authors do not want to include an AR1 process for comparison (at least for

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the SPA record where alpha is near 1), they should explain shortly in the text why not without calling the AR1 process "unrealistic".

3. The authors have not replied yet to the comment about the estimation error of alpha.
4. Regarding trend removal and the interpretation of small frequencies in the DFT: Here again I agree with Mudelsee. The authors should really mention in their ms that in general one has to be careful with interpretation of small frequencies if trends cannot be excluded per se. My impression is that exactly this interpretation seems to cause a lot of confusion and may be easily misunderstood. We all agree that the observed peak for low frequencies comes along with the V-shape of the temperature record. The question is if this is now natural (due to a natural period) or if this is artificial (due to a first decreasing and then increasing trend). The simulated record (back transform of the DFT) shows only that one does not need an additional increasing trend for an approximated reconstruction of the record. **BUT THIS IS DIFFERENT FROM TO SAY THAT IT IS PURELY NATURAL.** It only says that a (possible) trend contribution is not significant enough to be distinguished from this periodicity (with the method used). Thus the real record may still incorporate both, a natural periodicity and an anthropogenic trend. This point can be easily clarified in the text.

Additional remark: I think there is also a similar misunderstanding around regarding the literature by Lennartz et al. (cited in the ms). In their analysis they do not distinguish between natural and un-natural trends. They only distinguish between significant un-natural trends and non-significant un-natural trends. A non-significant unnatural trend is not the same as a pure natural trend. The first may still contain both natural and un-natural contributions.

Interactive comment on Clim. Past Discuss., 8, 4493, 2012.

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