

Interactive comment on “Paleoclimate forcing by the solar De Vries/Suess cycle” by H.-J. Lüdecke et al.

H.-J. Lüdecke et al.

moluedecke@t-online.de

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Telford: "Lüdecke et al. process some annual-resolution but is apt to confuse the reader".

Answer: First we show by DFT that in the time dependence of all proxy records (solar as well as terrestrial) there is a dominant ~ 200 year cycle. We then analyse the temperature differences over 100 years (Absolute temperatures are less interesting – in the past higher temperatures occurred than those of today. Therefore it has been argued that the unusual happening during the 20th century be an unprecedented temperature rise. Thus we focus on temperature variations over 100 years.). Concerning the mentioned filtering, let us stress that the quantity in question, namely the temperature differences over 100 years, represent certainly a spectrally filtered version of the

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absolute temperature records. But since we analyse the temporal variation of the differences and not any property of the absolute temperature records, this filtering is nothing but a correct feature of the appropriate analysis method.

Telford: "the significant thresholds they use are pointwise. By testing the risk of Type I error"

Answer: We do not understand this objection. On page 283, under 4. Spectral analysis, lines 24-26 and page 284, lines 1-4 is described in detail how the significance lines in Fig. 3 are generated. Those lines are inevitably pointwise because the applied surrogates are discrete time series. The last sentence (Telford) "By testing the risk of Type I error" is ununderstandable to us. Please explain in more detail.

Telford: "Lüdecke et al. assume that the 200-year cycles must be solar driven. Over the last..... the proxies"

Answer: We do not assume a "must" but confirm in our paper a hypothesis with the view that many other studies hold likewise (see introduction). Concerning volcanic forcing we like to mention: In our introduction we cited Breitenmoser et al. who give under 2.2 a few hints to volcanic forcing and cite for their part Gao et al. However, also in Gao et al. we find nothing of the form of a volcanic 200-year cycle (over more than 2000 years). We would be grateful for references.

Telford: ""Unfortunately this test (MC) is severely biased.....A fair test would be to compare the correlation between each filtered surrogate and a sine wave fitted to it with the observed correlation".

Answer: The MC has to compare random time series (with same Hurst exponent etc.) with the real sine of our (four) difference series. In contrast, Telford proposes a MC which makes those real sine frequencies meaningless. A sine wave fitted - as Telford proposes it - results in surrogate-record-fits each with a quite different sine frequency. Therefore, we think that the Telford proposal is not the correct MC.

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Telford: “The running correlations are difficult to interpret without showing the null distribution expected from such heavily filtered records”

Answer: we do not understand “null distribution”, please explain in more detail.

Telford: “The predictions for future climate are dubious.....the predictions would be more credible if the methodes could be shown to have some predictive power”

Answer: We mention that the prediction is “tentative” because only the sine part is used. The predictive power can be seen in Fig. 9. The curves match (not too badly) the temperatures of the 19th and the 20th century, the latter already including possible anthropogenic forcing etc.

Telford: “Rather than making dubious predictions about future climate, it would be much more valuable if the authors explored the physical relationship between solar variability and the proxy records.....”

Answer: We have already answered this objection to the referees, see previous discussion.

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