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Climate of the Past Discussions

Interactive comment on "Climatic variability in Princess Elizabeth Land (East Antarctica) over the last 350 years" *by* Alexey A. Ekaykin et al.

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I would like emphasize the importance of Dmitry Divine's comment that the effect of smoothing on the correlation and regression should be considered.

A large part of the conclusions hinges on the finding that there is a significant relationship between the ice-core stack and instrumental temperatures. However, this relationship is based on a 52 year overlap of 27 year lowpass filtered data.

Repeating the same exercise with random data (white independent noise, 27year lowpass, finite response filter, filter length 41yr, minimum norm endpoint constraint) suggests that the relationship of the ice-core stack and the instrumental data is not significant ($p>0.1$). The real data and some examples of random data (which are by definition unrelated) are shown in the attached figure.

The same also applies to the relationship with the PAGES stack ($\sim$350yr overlap, $R=0.13$, $p>0.2$) and Schneider stack ($\sim$200yr overlap, $R = 0.36$, $p\sim0.1$), only leaving the relationship to the IOD index significant, as long as the linear trend is not removed.

This is not just a statistical subtlety as the strength of the temperature to isotopic composition relationship in high resolution records derived from Antarctic low-accumulation regions is under debate. I still think that this is a very useful manuscript as it presents new records in a data-sparse region. However, if my assertions are confirmed, I would propose to tone down the temperature interpretation of the record (e.g. "1C warming over the last three centuries") and either avoid to provide a temperature calibration, or to provide proper uncertainty bounds.

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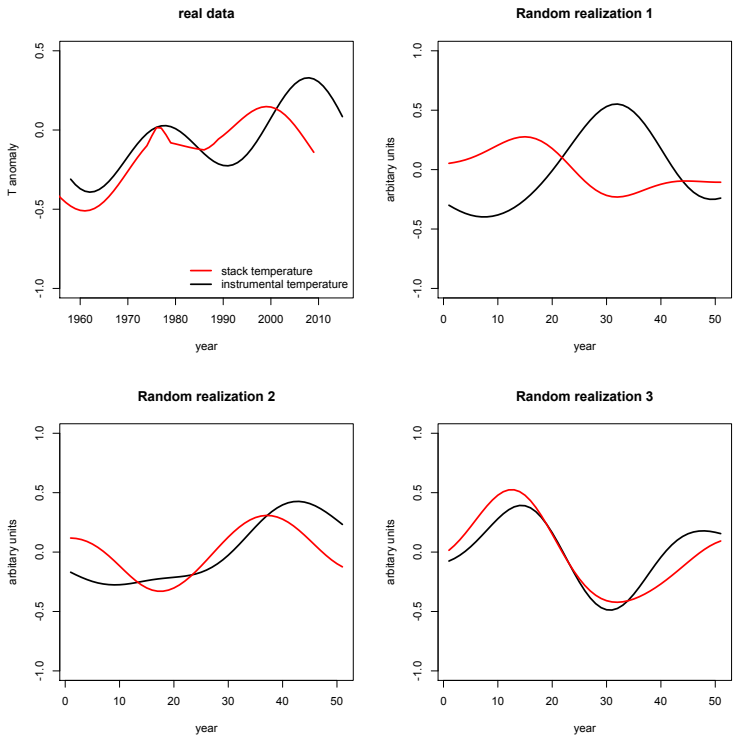
real data
T anomaly
year
stack temperature
instrumental temperature
Random realization 1
arbitary units
year
Random realization 2
arbitary units
year
Random realization 3
arbitary units
year

Fig. 1.