

## ***Interactive comment on “Temperature changes of the past 2000 yr in China and comparison with Northern Hemisphere” by Q. Ge et al.***

**Anonymous Referee #1**

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Interactive comment on ‘Temperature changes of the past 2000 yr in China and comparison with Northern Hemisphere’ by Ge et al.

General comments: Based on proxy temperature reconstructions for different locations (see also Ge et al., 2010) the paper presents a new 2000 years long temperature reconstruction for China. The study is purely statistical. The authors compared the results of a principal components regression (PCR) and a partial least squares (PLS) approach. Based on a decadal scale analysis they show that several warm intervals were comparable with the Present Warm Period. The results of the paper are important and significant, and justify its publication. But the paper needs major revisions including a clear description of the used data, a more precise representation and description of the figures and, above all, an improvement of the language.

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Specific comments: -Page 509, line 17: Please explain shortly what the differences are. -Section 2 (Data and methods): The reader expects you give a more precise description of the data. I recommend inserting a table representing (at least) the site with the coordinates, the proxy type, the observed period, and the temporal resolution of each proxy. -Page 510, line 11: Maybe you have to explain what 0s and 1980s means. In addition, it has to be mentioned that a year (or a period) 0 does not exist. The calendar jumps from the year -1 (or 1 BC) to the year +1 (CE or AD), or from decade -1 to decade +1. -Page 511, line 12: Just add one reference for the MINITAB software. -Page 511, lines 27 ff.: The expression “we believe” cannot be used. You must be more precise and define the temporal resolution of the data in the above mentioned table. Page 513, line 20: It is difficult to denominate a clear period for the Little Ice Age (see e.g., Matthews and Briffa, *Geografiska Annaler* 87A/2005). Based on different significant publications (e.g., Miller et al., *Geophys. Res. Lett.* 39/2012, doi:10.1029/2011GL050168) the Little Ice Age started earlier. -Page 514, line 15: Write ‘unprecedented’ for ‘especially unusual’ because this expression is widely used (e.g., in the IPCC reports). -Page 514, line 21: Insert a reference for the ‘Roman Warm Period’ (see e.g. Ljungqvist, *Geografiska Annaler* 92/2010) because this is rather a Eurocentric expression. -Page 515, line 13: Is this conclusion legitimate if no error bars are shown? -Page 515, line 20 ff.: Where is that shown? At least you have to add a reference. -Page 516: Similar problem. Where can we see the comparison with Mongolia and Japan? -Figure 1: Denominate the two Figures with a) and b). The small Figure in the lower right corner of the map is not readable. In addition, I recommend being much more precise in the text of the Figure (e.g., speak about ‘temperature proxies’ and describe what the different size of the points for Central East means). -Figure 2: You write ‘PCR and PLS with uncertainties’. Should you not denominate it as ‘error bars’ and define the confidence intervals in %? I also recommend to add a second graph below which is representing the number of the proxies used in the different periods. Possibly the strong positive peak around 300 AD must then partly be interpreted as uncertain due to a low number of proxies (?). -Figure 3: Please split the two Figures in

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a) and b). As I mentioned before the comparison with Mongolia and Japan is neither shown nor underpinned by a reference. What do you mean with 'referenced period' (calibration period)?

Technical corrections: -Page 509, line 12: Omit 'and' before 'stalagmites'. -Page 509, lines 18-21: This sentence is very long and complicated. Please reformulate. -Page 510, lines 6-9: Rearrange this sentence. 'Based on their geographical locations. ....' -Page 511, line 6: Temperature 'profiles'? Do you mean 'time series'? -Page 511, line 24: Write 'shows' instead of 'contains'. -Page 511, line 25: Write '...centennial 'scale' temperature signal. ... -Page 511, line 27: Write 'Because' the raw temperature. .... -Page 513, line 3: 'and so may go some way' is unclear. Please reformulate. -Page 513, line 5: Write 'Finally, the periods with large. ....' -Page 513, line 14: Write 'Eastern China, and three from. ...' -Page 514, line 8: Write 'However, a large difference. ...' -Page 514, line 17: 'Seeing from the procedure of temperature variations' is unclear. Please reformulate. -Page 514, line 26: Write 'IPCC 4AR' instead of 'fourth report of the IPCC' -Figure 3, 4th line of Figure captions: You mean 'moving correlation coefficients'?

Ref. Ge, Q.S. et al., 2010: Temperature variation through 2000 years in China: an uncertainty analysis of reconstruction and regional difference. GRL 37, L03703, doi: 10.1029/2009GL041281, 2010.

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