

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

**Q. Ge et al.**

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Dear editor and reviewers,

We have answered each comment carefully. Based on the coauthors and the third reviewer’s suggestions, we changed and updated three new temperature proxies (including Liu et al., 2006; Chu et al., 2012 and Zhang et al., 2013, please see reference in our manuscript for details), which decreased the uncertainties during the first millennium. Thus the result of our reconstruction has a little difference with the old version. In addition, two recent publications of temperature series of China (Shi et al., 2012) and East Asian (Cook et al., 2013) suggested by the third reviewer have been added in Figure 3a. Please see our point-to-point response below, and use black and italic font to answer.

We would express our appreciation for your kind comments, which helped to improve the quality of this manuscript.

Thank you,

Anonymous Referee #3

The work of Ge et al. is an important new contribution on past temperature variations in China and is suitable for *Clim Past*. I would suggest the following comments to be taken into consideration during the revisions 1) Abstract: needs to be rewritten. The point on the PAGES contribution does not need to be in the Abstract. Need to be mentioned for which area and season the reconstruction is valid, provide information on uncertainties and what the is the novelty of the study.

A: we rewrote the abstract.

2) Intro: Need to include also the new findings of Shi et al. (2012), Cook et al. 2013 (*Clim Dynam*). As well as the PAGES 2k consortium paper and highlight what is the new contribution of Ge et al. 2013 PAGES 2k has 9 groups, including a new ocean one

A: Yes, we included the two new reconstructions in our manuscript. And we highlighted the new contributions in this part.

3) Data and Methods: This part needs improvements, both on the data and method side. Please clearly describe the data that have been used, distribution, length, seasonality, etc. I think it would be good to have another reference period, such as 1961-1990 as the long period currently presented is not optimal. The one from 1870-1990 is not appropriate as too long, including warming and cooling trends and the first part of the period is less trustworthy.

A: We added a new table including distribution, length, seasonality, references etc., please see Table1. We use 1851-1950 (100-years) as the reference period in the whole manuscript, this period did not include the significant warming trends, and the temperature over China was from 546 observational stations from 1871 to 1950, the

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quality has been controlled, which has been addressed in the reference Lin et al (1995), please see the reference part.

4) Need to say also more on the uncertainties, what kind of uncertainties are included, which not and why the PLS recon shown in Fig 2 is systematically warmer. Please also provide more details how you weighted and how the adjustments were done. Please provide also more information on the calibration and verification periods and round the values in Table 1 to 2 digits after the comma. Expressions like AD 0s should be replaced with more appropriate expressions

A: We now included the uncertainties about the results. PLS is not warmer than PCR after the new series were cited. The adjustment procedure, information of calibration and verification period was added. Please see end of method section. We keep 2 digits after the dot in Table 2 (before table 1). Expression like AD0s have been changed with “1”.

5) Page512: as mentioned above, the reference period should be changed. Result section, where comparisons are shown with other evidence from China. Please indicate how independent those reconstructions are in comparison with the new data set. Are the same proxies used for the different reconstructions, etc. please provide important information on how dependent/independent the different reconstructions are.

A: Yes, we changed the reference period with 1851-1950. The proxies in the reconstructions are not completely independent. Since not many good temperature proxies existed, if they are all independent in the different, this work could not be done I guess. But we added this information in the manuscript. Due to different part proxy and method for different reconstruction, they can be compared with statistical technique.

6) Comparison with other studies: The new reconstruction of Cook et al (2013) and Shi et al. (2012) should be included as well. In the parts where you compare the different reconstructions, please only report about results that are stat. sign. and give sign. level. It would be good here whether the current decades are exceptional in the

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context of the past, taking into consideration uncertainties.

A: the new reconstructions of Cook2013 and Shi2012 are included in Figure3a. And we only report the results passing 95% confidence level.

7) Conclusions: they should be reformulated, the content should be different from the abstract. The synthesis and major findings should be clearly formulated.

A: Yes, we formulated, please see conclusion part.

8) In Fig 3 also Ge et al. 2010, Shi et al. (2012) and Cook et al. (2013) should be included.

A: Now we included Shi et al. (2002) and Cook et al. (2013) in the Figure3. And text has included the comparison between them and our reconstruction. The curves in Ge 2010 are reconstructions for subregions in Northeast, Central China, Southeast, Northwest and Tibet, rather than for whole China, so we did not include it.

9) General: the paper needs a English check

A: Since CP journal has English editing service, we would request this service for our manuscript.

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Interactive comment on Clim. Past Discuss., 9, 507, 2013.

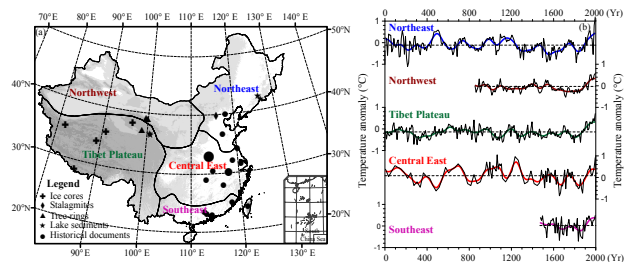
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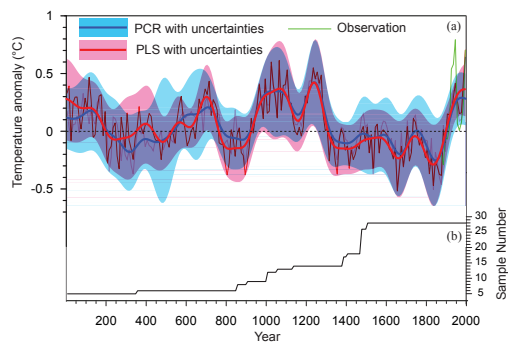
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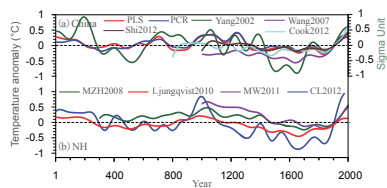


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**Fig. 2.** temperature reconstruction

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**Fig. 3.** Comparison of temperature reconstructions

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