

## ***Interactive comment on “A 368-year maximum temperature reconstruction based on tree ring data in northwest Sichuan Plateau (NWSP), China” by Liangjun Zhu et al.***

### **Anonymous Referee #2**

Received and published: 7 March 2016

The manuscript presents a July-August mean maximum temperature reconstruction for the West Sichuan Plateau covering the last 368 years. The resulting record is described and compared to other tree-ring based temperature reconstructions in the area. The authors comprehensively investigate the climate signal encoded in the tree rings, critically discuss the physiological meaning of the statistical significant climate-growth relationships found and perform a robust tree-ring based climate reconstruction. The results certainly add some new knowledge to the understanding of regional climate variability and makes it a worthy publication in Climate of the Past.

The manuscript will benefit from a last check by a native speaker. However, readability will improve quite a lot following the careful language check done by reviewer 1.

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Find below some general and minor comments.

1) The only potential weakness that I see on the paper refers to the chronology replication. Only 16 trees compose the chronology. This makes me wonder if the EPS has been calculated taking into consideration that more than one core per tree have been included in the chronology. It is not the same to calculate the EPS for an “n” of 32 than 16. On the other hand, I wonder if the few samples reaching back 1650 are cores from the same or different trees. How many trees are covering the part of the chronology with the lowest replication?

2) The authors compared the newly developed reconstruction with pre-existing temperature reconstructions. The correlation values obtained between the different reconstructions are not very high, but they are significant due the high number of observations. The interesting point of comparing different reconstructions is more related to medium and low-frequency climate variations than interannual. Hence, I would suggest to filter the reconstructions and discuss the similarities among them in terms of decadal to multidecadal variations. Moving correlations will definitely help to visualize and describe the periods of agreement and disagreement.

3) It would be also interesting to discuss the existence or not of the Little Ice Age in the new reconstruction.

4) The authors discuss the link between solar changes and temperature variations. What about the volcanic forcing? A large number of studies have reported a link between volcanic eruption and temperature changes. I would suggest to include some analysis (such as superposed epoch analysis) in order to complete the discussion including the influence of volcanic forcing on temperature variations.

5) I would also recommend to rewrite the conclusion section. At the moment looks pretty much like a summary of results and lacks the description of the main findings and their implication on a more general context.

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Minor comments: Table 3: “-0.288\*” should be changed to “-0.29\*”

Figure1: The scale of precipitation should be double the scale of temperature.

Figure 3. Labelling each graph with the corresponding climate variable will make the figure easier to interpret at a first look.

Figure 4: The results of the residual analysis are embedded in the text but it would also be nice to show the plot of the residuals in this figure.

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