

## ***Interactive comment on “Climate patterns in north central China during the last 1800 yr and its possible driving force” by L. Tan et al.***

**Anonymous Referee #3**

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Tan et al. used the high-resolution precisely-dated stalagmite records and historical records in north central China to reconstruct a decadal resolution precipitation during the last 1800 yr, it is very important to reveal the climate changes at centennial- to decadal-scales in northern central China during the last two millennia. However, current version I would suggest the CP editor to ask for a major revision before accepting it for publication. Here are a few basic comments that could guide the authors to submit a more detailed manuscript. 1. In data and method section, the author used the drought/flood index to synthesize the precipitation variation. However, the index is not only affected by the precipitation, but also connected with the temperature, especially the drought. So the authors should give the evidences to support the changes of the drought/flood index most due to the precipitation. 2. For the synthesized precipitation index, what the method be used to synthesize the index? the average value of four

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records, or the value weighted by the areas? It may be induce the different results using different methods. The authors need the explanations in details. At the same time, please show the standard deviation or error bar for the statistics in the Figure 2. 3. For the precipitation and temperature patterns, because the variations of precipitation and temperature may be not the same in different areas, e.g., stalagmite  $\delta^{18}\text{O}$  records in Huangye cave and Wangxiang cave, the trends of variations before 1000 AD are mostly reverse on the centennial scales (Figure 2). So the comparison of pattern of precipitation and temperature need choose the records at the same area, and the authors should give the reasonable explanations for why the temperature record of tree ring in Dulan, Tibeatu Plateau can represent the changes for northern central China. 4. In page 1035, lines 3-10, authors reveal that “This warm-dry pattern in the late 20th century is distinctly anomalous as compared to earlier times, which was characterized by warm-humid or cool-dry pattern.” But in fact during the periods of 800-900 AD, and 1300-1400 AD, the warm-dry pattern is same as the 20th century in Figure 4, so the authors can not deduce the conclusion “The anomaly may suggest that the dominant forcing of climate variability in north central China changed from natural to anthropogenic in the late 20th century”.

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