

## ***Interactive comment on “A combined Terra and Aqua MODIS land surface temperature and meteorological station data product for China from 2003–2017” by Bing Zhao et al.***

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Although the development of thermal infrared remote sensing technology has made it possible to obtain surface temperature over a large area, there are still many missing values of temperature due to the influence of clouds and rainfall in most parts of China, especially in southern China. In this manuscript, the authors reconstruct a high resolution land surface temperature dataset by combining multiple source data. This dataset covers the complex climate and topographical conditions in China and is very useful for regional climate and drought research. This manuscript proposes a new idea to retrieve LST of pixels under cloudy conditions which highly suitable contribution to

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Earth System Science Data. The authors show the validation in annual and seasonal scale for different areas with different climatic condition, which is important to further clarify the usage limitation for end users. It also provides a good data set for our meteorological department, which provides good support for long-term regional climate change research. Overall, this is a really nice contribution. A couple of suggestions and comments to improve the paper: Response: We would like to thank Dr. Wu for the guidelines and constructive comments to our manuscript. These feedbacks made by the reviewer will clearly help to improve the manuscript. In the following, we provide point-by-point answers to the Dr. Wu's comments. 1) Pg.13, Line 412 " $R > -0.6$ " should be " $R < -0.6$ "? Response: Many thanks for your attentions. We have revised the error in the new version of the manuscript. 2) The legend of figure 8 should be revised (add unit). Response: Thank you for this comment. It will be corrected in the revised manuscript. 3) The average annual diurnal LST difference from 2003 to 2017 is characterized by the blue line AB, which indicates the boundary between the eastern China and western China." However, I have not seen the results. Response: Thanks for this comment. The expression here is that the diurnal LST difference has a tendency to distribute along the Hu Line (ie, the blue line AB): in most areas, the diurnal LST difference in the west is higher, and the diurnal LST difference in the east is lower. This is in good agreement in the southern part of China, but may not be well reflected in the north, especially in the Northeast. So we removed the statement about this part of the content in the revised manuscript. 4) According to Figure 1, Line 428 should be the warming trend of the Loess Plateau in the western part of the Taihang Mountains, not the eastern part. Response: Many thanks for your attentions. We have revised the error in the new version of the manuscript.

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