

Geosci. Model Dev. Discuss., referee comment RC1  
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## Comment on gmd-2021-435

Anonymous Referee #1

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Referee comment on "A daily highest air temperature estimation method and spatial-temporal changes analysis of high temperature in China from 1979 to 2018" by Ping Wang et al., Geosci. Model Dev. Discuss.,  
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**General comment:** The daily highest air temperature ( $T_{\max}$ ) is a key parameter for climate change analysis. The authors proposed an estimation model to obtain high-precision  $T_{\max}$ , and built a dataset of  $T_{\max}$  in China from 1979 to 2018. The authors analyzed the spatial-temporal variation characteristics of high temperature in China using the estimated  $T_{\max}$  data, and found that the frequency of high temperature events in most areas of China exhibited an increasing trend. The authors also showed that the temperature abrupt changes mostly occurred in El Niño years or La Niña years, indicating that China was highly vulnerable to global climate change. By analyzing the impact of ocean climate modes on temperature in China, the authors found that the warming of the Indian Ocean had a strong positive impact on warm events in most regions of China. This study is novel and significant for estimating  $T_{\max}$  by using multi-source data and predicting extreme weather. I suggest to accept this manuscript after minor revisions. Follows are some specific comments.

### Major comments:

- Section 2: How are the boundaries of regional divisions determined?
- Section 4.1: How to solve the problem of different spatial resolutions of ERA5 data and CMFD data?
- Section 4.4: Are the 90th percentile in TX90p and the 10th percentile in TX10p determined based on all the data in a year?
- Section 5.2: What is the significance level represented by "Significant upward" and "Significant downward" in Table 2?

## Minor comments:

- L26: "region" to "regions".
- L50: "model" should be "models".
- L55: "spatialize" should be "spatialized".
- L77: "use" should be "used".
- L93: "use" to "used".
- L94: "constructs" to "constructed".
- L178: "considers" to "consider".
- L196: I think "the missing point" should be "the missing values".
- L200: Should "used it" be "used sine function"?
- L205: No need to express here: "Use the least square method to solve the unknowns A and B."
- L284: "may be" to "can be".
- L306: delete "the correlation coefficient".
- L384: "opposing" to "opposite".
- L386: "the regions with the fastest  $T_{\max}$  rise in spring, summer, autumn and winter are III, I, I and VI respectively" to "in spring, summer, autumn and winter, the regions with the fastest  $T_{\max}$  rise are III, I, I and VI respectively".
- L443: "built data" to "the dataset".
- L460: "first decreasing" to "decreasing first".
- L482: The tense of "The regions with no significant change in SU are mainly distributed in region VI" and the following sentence are not consistent.
- L605: delete "daily".