

Comment on **essd-2020-343**

Anonymous Referee #1

Referee comment on "Construction of homogenized daily surface air temperature for the city of Tianjin during 1887–2019" by Peng Si et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-343-RC1>, 2021

The century-long homogenized temperature data is typically lacking and further hampers the robust detection of climate change. Therefore, it is imperative to construct this dataset, laying foundation for better understanding of climate change and variability. To this end, the manuscript by Si et al. confronted this challenge by attempting to construct more than 100-y homogenized temperature dataset at Tianjin, China. This work made significant contribution to the community of climate and climate change. Overall, the homogeneity procedures and test methods are technically robust and scientifically sound. The trends of Tmax, Tmin and Tmean are basically consistent with the well-established trend in midlatitudes, suggesting the findings obtained by the authors are meaningful. Nevertheless, there are still room for improving the quality of this manuscript by adequately addressing following comments:

Major comments:

- Figure 6: I noticed that the significant breakpoint occurred in 1955 for Tmax but in 1992 for Tmin. Why did these points differ greatly? is this due to non-climate factor such as station relocation? If so, the influence is supposed to be the same. Explanation or discussion for this interesting phenomenon will benefit the improved understanding of the newly-constructed homogenized dataset.
- L393-396: it seems a paradox to argue that "annual trend change in mean temperature based on newly constructed series in Tianjin **is similar to** that for China (Li et al., 2020c)..". On the contrary, the trends derived from the other two dataset (Berkeley Earth and CRUTS4.03) are more similar the national warminig rate as shown in Table 5. The authors are suggested to clarify this point.

Minor comments:

- L55: "representativeness" -> "better representativeness"
- L286: "surface observation station" -> "surface weather station"
- L291: "quantile matching" has been widely used in recent research associated with precipitation (Lv et al. 2020, doi:10.16/j.atmosres.2019.104671), and PM2.5 (Bai et al. 2020, doi:10.5194/essd-12-3067-2020), which is suggested to be mentioned.
- L384: "indicates"-> "shows"
- L392: "internationally authoritative data calculations"? are there any references to support this argument? Further, this sentence is not logically connected with the following sentence "so they are more consistent". For instance, what does the "they" refer to? Therefore, it is suggested to be rewritten.
- L404: "indiates"-> "shows" or "illustrates"
- L409: grammar errors in "all passed"
- L410: "trends of TN10p and TX10p in spring are the largest. They are" -> "the negative trends of TN10p and TX10p in spring are the largest, reaching up to be"
- L422: it seems a little strong tone to argue "These same procedures could and should be use", which can be softened, since there are large room to improve the procedures for data homogeneity. More importantly, it remains unknown whether the procedure developed here can be genalized or applied to other regions, which merits further investigation.