

Earth Syst. Sci. Data Discuss., referee comment RC2  
<https://doi.org/10.5194/essd-2021-231-RC2>, 2021  
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## **Comment on essd-2021-231**

Anonymous Referee #2

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Referee comment on "Homogenized century-long surface incident solar radiation over Japan" by Qian Ma et al., Earth Syst. Sci. Data Discuss.,  
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### **General comments:**

This study presents first homogenized century long datasets of observed surface incident solar radiation and sunshine duration derived solar radiation over Japan. After homogenization, the two independent estimates of surface solar radiation are more consistent in trends, which is also consistent with our expectation from clouds and dust storm. The reviewer recommends this great effort, which provides key datasets to understand regional climate change. It is also useful for studies for energy and water cycle, and ecological process.

I have some major comments to help the authors to improve their presentation.

First, a more comprehensive literature review is needed. Most cited articles are several years ago. This field is fast developed, the authors should add more recent publication and provide more critical literature review.

Second, the homogenization process should be more clearly presented, which is essential for authors to understand the derived dataset.

**Specific comments:**

Line 34-35: the specific definition of a sharp decrease and a gradual decline.

Line 99: suggest to review all the relative homogenization methods and point out the reason to use RH method.

Line 121-122: misleading sentence—"before 1990" may be replaced by "until 1990" or "since 1990" ?

Line 129-130: the variables should be italic.

Line 145: confirm the reference format. Generally, it should be author(date) format.

Line 150: the variables should be italic.

Line 187-189: suggest to move this part to method section.

Line 198-199: why figure 5 only show the time series of HAMADA site, how about the performance of other stations. Please provide more related information.

Line 202-203: Please provide some information on how you calculate the average time series in figure 6-7 at 41 sites or 156 sites.

Line 262: add the method for trend calculation.

Line 327-336: rewrite this part to highlight what you do and the value of this work.