

***Interactive comment on “Decadal variations in estimated surface solar radiation over Switzerland since the late 19th century” by A. Sanchez-Lorenzo and M. Wild***

**Anonymous Referee #2**

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The manuscript entitled "Decadal variations in estimated surface solar radiation over Switzerland since the late 19th century", by A. Sanchez-Lorenzo and M. Wild, deals with the analysis of a sunshine duration and total cloud cover data set, covering a very long period, and a surface solar radiation network available for recent decades, with the aim of extending the latter in the past using the former as a proxy.

The analysis is rigorous and well done, taking care of the quality and homogeneity of the data. The results are well discussed and the work provides with relevant information concerning a variable not yet well stressed at present in the scientific literature (mainly due to the unexploited data).

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For these reason I recommend this manuscript for publication.

I only suggest some minor improvements/clarifications:

Section 1

pag 10817 line 15-17: also Brunetti et al. (2009) (already present in your bibliography) highlighted an disagreement between SD and TCC trends, add it among the quoted references.

Section 2

pag 10819 line 20: replace "missing" with "available"

Section 3

pag 10821 line 10: replace "autocorrelation" with "correlation"

Section 4

pag 10822 lines 5-6 and 15-17: here it is not clear how the RMS errors were evaluated. The correct procedure would be a leave-one-out approach, i.e. reconstructing each SSR station series by evaluating the SSR-SD relationship excluding the station itself from the analysis, and comparing observed-SSR and reconstructed-SSR. Please, clarify this aspect.

Section 6

I am left with the doubt of what the 1931-1980 trend is in clear-sky SSR, i.e. for the longest period as possible before the recent brightening.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 10815, 2012.

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