

Interactive comment on “Detection of dimming/brightening in Italy from homogenized all-sky and clear-sky surface solar radiation records and underlying causes (1959–2013)” by Veronica Manara et al.

Anonymous Referee #2

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The authors presented a thorough analysis of daily solar radiation records based on ground-based data measured at 54 stations in Italy. The records cover a time period of 55 years while the data sets were homogenized and spatially gridded in order to obtain valuable scientific results. The techniques used in this research were well documented and justified.

I would like to point out some aspects that the authors should include into their revised manuscript:

The authors should include the necessary information about the instrumentation they

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used for their research and provide adequate description of the measurements themselves. Although they have the instrument type in table 1, no information is provided about the characteristics of the two types of solar radiation measuring instruments (Fuess-Robitzsch and CM11Kipp & Zonnen). So I expect this information to be provided in section 2 and not only mentioned in table 1 and line 131.

The authors provide the SSR daily values in W/m². The CM11 instrument can provide measurements at high time frequency, therefore I expect a description of the original data time frequency and the steps towards obtaining the daily values (are they daily mean values?).

For the stations where Fuess-Robitzsch were replaced by CM11 pyranometers, are there any intercomparisons for any available common period of deployment?

Having all this information into section 2 will set the need for homogenization into a more solid basis.

Please check for consistency the comment in lines 258-259. In line 257 you firstly provide a positive trend and then a negative, so it should be brightening for the first trend and dimming for the second.

line 149: "at least six monthly...", do you mean daily? please revise.

line 219: "As a consequence the series shows only some windows of less than 30 years and starting in the 1960s ...". please revise because the flow of the sentence is not coherent. I guess that you only detected time windows of less than 30 years with statistical significant trends ...

line 222: "The spring season has a pattern similar to the year with..." I suggest to change year to annual although you use year into the figures.

general comment: please have your manuscript revised by a native English speaker.

Small errors were found (e.g. line 126 "...at (in a) monthly time scale', line 173 "...for

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82% of (the) original...", line 251 "...were calculated (by) averaging...", line 352 " At this purpose..." is not a common expression, ...)

References: please provide some references for the examples used in lines 32-33 and for the digital elevation model referred in line 254, if any.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-206, 2016.

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