

## ***Interactive comment on “Baseline Surface Radiation Network (BSRN): structure and data description (1992–2017)” by Amelie Driemel et al.***

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Review of “Baseline Surface Radiation Network (BSRN): structure and data description (1992-2017)” by Amelie Driemel et al.

This is a nice overview and update on the current status of BSRN. The manuscript provides a detailed description of the available stations, parameters and data, as well as the data formats and associated analysis tools, which should provide a useful documentation for any user of the BSRN data. The manuscript is well written and easy to read. I personally would have highlighted the scientific impacts of BSRN more. But I understand the authors want to focus on the technical and data documentation aspects of BSRN (as the title indicates), and that is probably ok for the purpose of this

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manuscript.

After 20 years since the last peer-reviewed publication of BSRN, I believe that BSRN really deserves an update in the peer-reviewed literature, and I wholeheartedly support its publication.

Specific comments:

P2 L7: replace “with data” by “delivering data to the archive”

P2 L8: “distributed over all continents”: this excludes stations in oceanic environments. Although very limited in number in BSRN, they should still be referred to as well.

P2 L15: Add “e.g.,” in front of the references, as there are many other studies that point this out.

P2 L23: “temporal resolution”

P2 L29: “see also” at wrong position

P2 L33: “for use in satellite and climate model validation”

P3 L4: Add Ohmura et al. 1998 to this reference list

P3 L11: see comment P2 L7

P3 L16: either use consistently shortwave/longwave, short-wave/long-wave, or short wave/long wave throughout, but not in a mixture as it is now in the manuscript.

P4 L5ff: How about aerosol information?

P4 L14: maybe “types of instruments”

P5 L13: expand what Solpos means.

p5 L28: “corrections can be made using algorithms that make use of the other co-located data that is part of the BSRN instrument suite”. What other data are these?

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p6 L4/5: “Other interesting papers on the quality and possible biases of radiation measurements were published by Vuilleumier et al. (2014), Olefs et al. (2016) and Nyeki et al. (2017)”. It would be helpful for a reader to expand a bit on these to get an idea whether they are of relevance for his/her application. Just “interesting“ is a bit vague.

p6 L11: “LR0100+0300 or LR0100 and LR3010” , add here “see Table 1” to clarify the meaning of this statement.

p7 L11: “Arithmetic averages can be calculated via "Method" but the results should be considered with care in cases where significant data gaps exist.” I think this is a critical point, it is good that it is mentioned here, but I would emphasize this even more strongly. I have seen several applications where BSRN monthly means have been generated this way without any critical assessment. I would even opt to remove this function from the data warehouse as the risk of misuse is very high, as also past experience showed.

p7 L25ff: As mentioned in the general comment. I personally would have highlighted the scientific impacts of BSRN more, and not just put it in one small paragraph as part of the summary. But as said I understand the focus of the manuscript is on the technical aspects of BSRN, so I do not request to expand this further.

p7 L26: The first study that made full use of the BSRN network to estimate trends and constituted the "solar brightening" was: Wild, M., Gilgen, H., Roesch, A., Ohmura, A., Long, C., Dutton, E., Forgan, B., Kallis, A., Russak, V., and Tsvetkov, A., 2005: From dimming to brightening: Decadal changes in solar radiation at the Earth's surface. Science, 308, 847-850, which could also be mentioned here.

p8 L5: I think the focus should not be simply on “as many stations as possible”, but rather on the worldwide coverage including particularly also ocean and remote land areas, as well as on the coverage of all major climate regimes.

p9 L17: Should the complete reference not read: König-Langlo G, Sieger

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R, Schmithubsen H, Bucker A, Richter F, Dutton EG (2013) The baseline surface radiation network and its world radiation monitoring centre at the Alfred Wegener Institute. GCOS Report 174: update of the technical plan for BSRN data management. World Meteorological Organization (WMO). <http://www.wmo.int/pages/prog/gcos/Publications/gcos-174.pdf>

Figure 1: I would also add the yellow circle, indicating stations that measure both upward and downward radiative fluxes, to the legend underneath the map for completeness, as on a first sight one wonders what this prominent yellow circles mean and then first searches for its explanation in the legend. But why only the stations that measure both upward and downward radiative fluxes are labelled with their BSRN abbreviation? This looks a bit like a “two class BSRN society” too me. I think this should be avoided.

Figure 3: what data are underlying the panel to the left? I assume minute data? And from which station over what period of time?

On a personal note it was with great sadness that I learned on this way that Rainer Sieger passed away. Although I never met him personally I very much appreciated the great support I obtained from him in the process of data submission to PANGAEA.

Martin Wild, 20. 3. 2018

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