

Interactive comment on “Assessment of BSRN radiation records for the computation of monthly means” by A. Roesch et al.

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Thank you very much for the second review of our paper.

We fully agree that the paper excludes the application of robust statistics for the gap filling process in the radiation time series. However, it is of major importance to express that the paper is testing the performance of averaging methods that are currently applied in the climate and radiation community to the BSRN data. To consider the reviewer's suggestion, we reformulated the sentence “It is impossible to accurately manufacture values corresponding to the missing data” as following: “It is very challenging to accurately manufacture values corresponding to the missing data”.

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When writing the paper, we first included the persons' names belonging to the presented methods. As we know about the problems inherent to the methods we decided, however, not to mention the authors of the seven algorithms as it is not relevant for the understanding and discussion. Following the reviewer's suggestions, we inserted the following sentence: “These type of methods have been used in many practical applications, e.g. Zhang et al., 2004; Dutton, E.G. et al., 2006; Wild et al., 2006; Hinkelman et al., 2009.”

Summarizing, we do not claim that we developed the best method, we only investigated possible advantages and drawbacks of existing methods that are currently used in the BSRN community.

We fully agree that it is “clearly inappropriate” using method M1 which includes all data. Concerning BSRN, we know that papers do exist that are based on BSRN monthly means that have been computed this way using all data, ignoring any data control. Therefore, a major goal of the paper is to show the climate community the importance of accounting for the data quality when using the data.

We agree that some of the methods include to some extent arbitrary thresholds. But again, these thresholds have been found and tested by experts in the field of surface radiation and do thus represent common practice within the radiation community. Most thresholds were set based on expert knowledge, visual inspection of appropriate illustrations and practical reasoning.

As the first author will soon finish a (two-years) course in advanced statistics which also covers the field of robust statistics, we plan to apply robust statistics to the computation of BSRN monthly means at a later stage. But this is not the topic of the paper at hand.

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