

Interactive comment on “Is it feasible to estimate radiosonde biases from interlaced measurements?” by Stefanie Kremser et al.

Anonymous Referee #1

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When radiosonde instruments change it is essential to estimate any systematic differences between measurements from the old and new instruments as accurately as possible. Such estimates can be most accurately obtained from ascents with both instruments attached on the same balloon over a certain period of time (order of 1 year) or from interlaced measurements, thereby avoiding the extra cost of two measurements per flight.

The authors show convincingly that the interlaced approach yields much less accurate estimates, particularly if autocorrelation is low. In order to achieve a target accuracy of 0.1 K at least 2 years of interlaced measurements (if launched once per day) are needed for autocorrelation coefficients between 0.9 and 0.95. This may be longer than the lifetime of a particular radiosonde model. And also this yields only an annual mean

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bias estimate, no bias estimates as a function of e.g. solar elevation.

The paper convincingly makes the case for the need of dual measurements to achieve the quality of bias estimates needed in a reference network such as GRUAN.

What I am missing as a reader are one or two vertical profiles of autocorrelation coefficients calculated from radiosonde temperature time series in the Tropics and in the Extratropics. This would be helpful for estimating which curve in Fig. 4 is the most relevant one. So far the paper only states that the autocorrelation at Lindenberg is around 0.5. The autocorrelation at other levels and regions may be quite different.

Apart from that minor issue the paper is well structured and well written and I recommend publication with the suggested minor revision.

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