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Interactive comment on "Errors and adjustments for single-Alter shielded and unshielded weighing gauge precipitation measurements from WMO-SPICE" *by* John Kochendorfer et al.

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General comments

The paper "Errors and adjustments for single-Alter shielded and unshielded weighing gauge precipitation measurements from WMO-spice" by John Kochendorfer et al. is published as a part of the HESS special issue presenting results of the recent WMO initiative evaluating the catch efficiency from different gauge types. The paper contributes to the present efforts of adjustments of precipitation undercatch for a wide range of applications in climatology and hydrology as well as real-time corrections for nowcast and short-term forecast applications. On the basis of well measured data from eight locations including lowland and mountain stations it presents transfer functions

which can be used to adjust 30 minute precipitation gauge data for undercatch in scientific studies and in operational services. The paper is well structured and concisely written. It presents the literature on this subject comprehensively. The paper is worth publishing in HESS with a few minor corrections.

Specific comments

(1) The authors used aggregated 30 minute precipitation data to develop the transfer functions. However, the authors should discuss if the presented transfer functions are also valid adjusting precipitation data of higher or lower time intervals, e.g. 10 minute, hourly or daily. Deviations can be expected caused by different mean wind speeds. This may be achieved by calculating adjusted precipitation for the sub-daily time intervals and comparing the daily aggregated values.

(2) The authors present the complexity of errors at mountain stations. Especially the Weissfluhjoch station showed individual deviations at high precipitation – high wind speed events. Using a lower maximum wind speed thresholds results in smaller errors at this station. It will be advantageous if the authors present at least an advice on how to quality control data of mountain stations for such anomalies from the presented transfer functions without having a DFAR reference.

(3) Since no transfer function for adjusting liquid precipitation is presented, please consider to add "for mixed and solid precipitation" to the paper title.

Minor Comments

P3 Line 11ff: Please add the time interval of the data analysed.

P3 Line 16: The last sentence may be shifted to the conclusion section.

P4 Line 21 and 23: Please present the expected min/max/range values for the 1 minute values.

P5 Line 23: Please refer to the number of events given in Tab. 1 and 2.

P7 Line 1: Add the information of time interval for aggregation of 30 min.

P8 Line 12: The 30 minute minimum thresholds of SLEDS are quite low. Disaggregating these values to 60 % of 30 minutes results in precipitation rates of a minimum of 0.001 to 0.002mm/minute. How do these values correspond to the nominal accuracy of the precipitation gauge?

P9 Line 16ff: Is it the maximum threshold of the 30 min average wind speed or is it the maximum wind speed in the 30 min interval. Please clarify.

P11 Line 25ff: The higher catch efficiency might also be caused by increased wind influence and thus undercatch at the DFAR. Please discuss.

P12 Line 15: Please define "other sites".

P12 Line 18: Replace "alpine measurements" by "measurements at mountain sites"

P15 Line 29: (here and throughout the text) Are the same stations meant with "alpine" and "mountain" sites? If so, please consider to use only one of the two.

Figures: Figure 2 and 6: To show the temperature dependence of Eq.3 please present additional calculations for at least one warmer and one colder temperature level (e.g. -2 and -10°C) .

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