In the following, the authors provide specific replies in blue color.

Response to Review #2

Undercatch in measurements of solid precipitation due to wind is a longstanding problem. To correct for undercatch, transfer function relationships have been established between Catch Efficiency (CE) and wind speed primarily, using either field experiments or numerical simulation. Temperature has recently been used as a supplementary explanatory variable in a transfer function. This paper demonstrates that a significant reduction in the root mean square error of residuals from that relationship can be achieved if snow intensity is used in place of temperature. The use of snow intensity as an explanatory variable is justified in physical terms through numerical CFD simulations. This is a significant finding which can lead to improved CE without the need for auxiliary measurements other than wind speed. The paper is well written and clear, and should therefore be published, subject to some clarifications and minor corrections.

The authors should justify the use of the same form of transfer function for wind speed and snow intensity as for a previously published transfer function for wind speed and temperature. Three of the four plots presented in Figure 3 relating CE to wind speed for different snow intensity categories show good agreement; the fourth (b) less so. Might a different functional form not have achieved better agreement? Did the authors explore this?

Exploring other functional forms of the CE curve is far beyond the scope of the present paper, since the regression coefficients obtained are sufficiently good to allow investigating the reason for the residual variance. Indeed, we used the mathematical form deriving from previous studies (e.g. Goodison et al., 1998, Yang et al., 1999, Wolff et al., 2015 and Kochendoffer et al. 2017a), based on a large number of experimental data, which proved to be sufficiently accurate. We initially performed some tests using a different functional form, obtaining very similar results, although the one from Kochendorfer et al. (2017a) was better in terms of regression coefficients. We believe that discussing the fitting of various functional forms would distract the reader from the main objective of the paper.

Our aim is indeed that of introducing the snowfall intensity as the main explanatory variable able to reduce the residual variance, after correction based on the wind speed alone, and to show by means of CFD simulation that this has a physical basis since SI is a proxy of the particle size distribution.

Other functional approaches could be addressed, e.g. to account for local climatological features, in case the regression coefficients obtained (0,75-0,9) are deemed insufficient, but this was already addressed in the above-mentioned literature and the reader is directed to it for any clarification.

The details of the various data sets used are scattered throughout the paper, and are not always clear. They should be collected in a table which summarizes, for each dataset, the location, period of record (period should not be used interchangeably with interval throughout the paper), basic sampling time interval, total number of data values etc. Label the sets A, B, C, D etc.

We followed this suggestion and added Table 1. We also checked the use of the terms "interval" and "period" in the revised version of the manuscript.

Throughout the paper, CE is represented by different expressions (symbols and words) in labelling diagrams and tables. CE should be defined clearly in an equation early on as the ratio of observed precipitation to the reference precipitation for the Altar Shield (define the subscript SA) , and the

symbol CE then used throughout, avoiding the cumbersome labelling of figure axes and multiple definitions of CE in figure/table captions.

We followed this suggestion by introducing the definition of CE at the beginning of the Introduction, and modified the axis labels accordingly.

Specific Comments

Specific comments are addressed in details in the revised version of the manuscript.

References

Goodison, B., P. Louie, and Yang, D.: WMO solid precipitation measurement intercomparison: final report. WMO Tech. Document 872, World Meteorological Organization, Geneva, Switzerland, 1998.

Kochendorfer, J., Rasmussen, R., Wolff, M., Baker, B., Hall, M. E., Meyers, T., Landolt, S., Jachcik, A., Isaksen, K., Brækkan, R., and Leeper, R.: The quantification and correction of wind-induced precipitation measurement errors, Hydrol. Earth Syst. Sci., 21, 1973-1989, 2017a.

Wolff,M., K. Isaksen, A. Petersen-Øverleir, K. Ødemark, T. Reitan, and Bækkan R.: Derivation of a new continuous adjustment function for correcting wind-induced loss of solid precipitation: results of a norwegian field study. Hydrol. Earth Syst. Sci., 9(11), 10 043–10 084, 2014.

Yang, D., and Coauthors: Quantification of precipitation measurement discontinuity induced by wind shields on national gauges. Water Resour. Res., 35 (2), 491508, 1999.