Interactive comment on "Performance of post-processing algorithms for rainfall intensity measurements of tipping-bucket rain gauges" by M. Stagnaro et al. (Reply to Prof. Remko Uijlenhoet).

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We would like to thank Prof. Remko Uijlenhoet for his helpful comments. In a separate comment, we present a revised version of the paper, which also includes corrections of the minor issues that have been pointed out by the reviewer. Below we provide a point-by-point reply to the issues raised in his review (reported in bold).

First of all, I am not convinced Fig. 6 (the Taylor diagram) is the best way to present the results of the intercomparison. In any case, it was not easy for me to decipher it (particularly the choice of colors for the symbols was confusing to me).

In our opinion, the Taylor diagram (reported here in Figure 1 for your convenience) is a useful representation to show in the same graph the standard deviation of the rainfall intensity signal, the RMS difference of each event from the reference and the correlation coefficient between the one-minute RI signal derived from each TBRG measurement and the reference one. From Fig. 1, it is possible to notice at the same time that, using the inter-tip instead of the tip-counting algorithm, improves the correlation coefficients of the two TBRGs measures, reduce the RMS values with respect to the reference, but it has no significant effects on the standard deviation values (here expressed in terms of their normalized values).

Concerning the symbols, we used crosses to indicate the single event values while filled circles summarize the averaged values of all considered events. Colors are now changed from the initial version of the manuscript. The red values indicate the ideal TBRG and the black dot represents the OSK reference gauge.

Also, the "residual uncertainty in the calibration process" (see the Conclusions section) asks for further discussion. Are there ways to account for this remaining error source in the calibration process?

This is the calibration uncertainty, and it can be reduced - in general - by using accurate calibration facilities and standard methods for calibration that are traceable to the international standards. Unfortunately, no such standard exists at the international level for rain gauge calibration; therefore we usually follow the Italian national standard, dated 2012 and cited in the references of the paper (a new standard is presently in preparation under CEN). The magnitude of the calibration uncertainty is included in the criterion used to assign a class to the instrument in the Italian standard (three classes depending on the residual bias and the associated uncertainty). Although this is recognized by the WMO, following the recent Laboratory and Field Intercomparison

of Rain Intensity Gauges in 2005 and 2009, no international reference is yet available. This is why we did not mention it and just commented about the “residual uncertainty in the calibration process”.

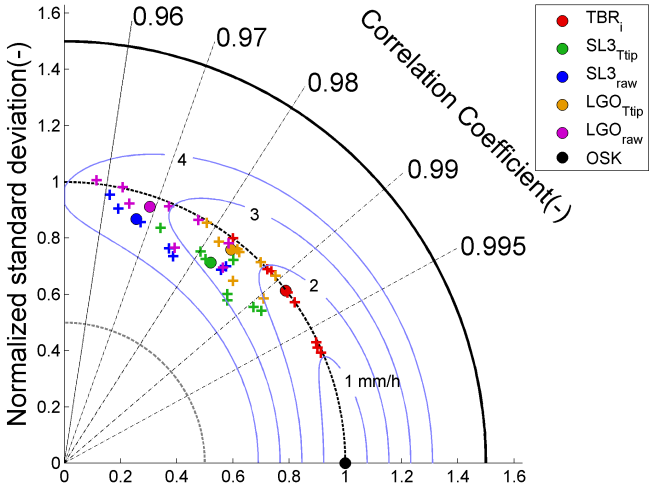

Figure 1. Taylor diagram representation of pattern statistics of the various RI series. The radial distance from the origin is proportional to the normalized standard deviation of the RI signal; the blue contour lines highlight the RMS difference from the OSK reference (black dot) for each recorded event; the azimuthal position indicates the correlation coefficient between the RI signal and the reference. Crosses indicate the statistics of each single event, while the dots indicate the average values of the whole campaign (colors according to the legend).