

Interactive comment on “On the Use of Measurements from a Commercial Microwave Link for Evaluation of Flash Floods in Arid Regions” by Adam Eshel et al.

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Dear authors,

as a radar user, I am aware of the limits of the instrument so that seeking for additional information from other sources is largely welcome. In addition, as I got to know the area object of this study, I believe you are addressing an important and difficult challenge in aiming at flash flood warning in the region.

We recently presented the spatial and temporal characteristics of convective rainfall in the same area (<https://doi.org/10.1016/j.atmosres.2017.09.020>) using a high resolution

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X-Band radar benchmarked with data from the C-Band radar you use, even though with an improved elaboration procedure. We analyzed 11 events, including at least one of the events also presented in this study, finding very large spatial and temporal variability: correlation distances < 5 km, time-correlation distances < 10 min.

This raises questions about this study: how can 30-min measurements of average attenuation along a 16-km link covering part of the catchment provide information for flash flood warning in the Ze'elim basin without the radar information? Such a microwave link cannot provide information on (a) the local rain intensities occurring within the 16-km link – this length is much larger than the typical scales of convective rainfall in the area, and this is partially addressed by the method you propose, and (b) all for the portions of the catchment not covered by the link path.

The method you propose makes use of radar data to add indirect information on spatial rainfall variability to the link's quantitative estimates. Information from both instruments is thus required, but this information is only partially exploited. In particular, radar data is believed to represent the spatial variability of rain, but it is not trusted quantitatively since rain gauges cannot be reliably used to adjust the radar data in these conditions of spatial variability. However, the microwave link provides local quantitative information aggregated over a 16-km path, thus more reliable than that of rain gauges.

Why not using the link to adjust the radar estimates? This would provide spatially distributed information over the full catchment, improving the quantitative accuracy of radar estimates and fully exploiting the characteristics of the two instruments. At this point, both kurtosis and quantitative rainfall estimates from the radar over the full catchment could be used following the method you are proposing.

Best regards,
Francesco Marra

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