

Interactive comment on “A radar-based regional extreme rainfall analysis to derive the thresholds for a novel automatic alert system in Switzerland” by L. Panziera et al.

Anonymous Referee #2

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This is an interesting and a well written paper. It describes an operational warning system that is based on radar-rainfall combined with nowcasted rainfall to derive several regional statistics. These statistics are compared with thresholds obtained from extreme event analysis applied to block-maxima series. The study presents a one more step forward in operational utilization of radar rainfall in real-time alert applications. The study is a continuation of the substantial scientific efforts taken by MeteoSwiss in developing radar-based QPE algorithms that are accurate enough to allow their use in operational systems.

Below are few comments to be considered:

1) It was not clear (at least to me) how the thresholds are actually set for each region?

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Is it selected by the value corresponds a specific recurrence interval? if yes, what recurrence interval? for which duration? How the different levels (Alert level 1 - Alert level 4) of alerts are set?

2) A main problem related to the question above is that, typically, if we set the thresholds relatively low, we will have high false alarm rate but also high hits rate, while setting the thresholds high, and vice versa for a too high threshold. The threshold selection is not a straightforward task and it affects the general performance of the alert system. Therefore, guidance for how to select the thresholds or the appropriate duration and recurrence interval is important.

3) The authors state that "a verification of the alerts issued by NowPAL is beyond the scope of this work" (P. 4, L. 25), which is understood. However, to my opinion it would benefit the reader to get some statistics on the rate of alerts issued in each region, beyond the single case shown in this paper.

4) "The local maxima used for the statistical analysis have not necessarily been measured at the same place, but they might have occurred at different locations within the region of interest". This means that the return periods are dependent (among other things) on the relation between the window size and the region size, i.e., for a relatively small window applied once to a small region and once to a large region, the return periods of the former will be generally lower than the latter, without a real change in the precipitation regime. Does this affect in any way the threshold selection?

More specific comments or required clarifications:

1) Did the goodness of fit of GEV was examined? 2) What about the effect of snow? how well it is estimated by the radar? 3) How does the window applied close to the region border? 4) P. 8, L. 29 - correct to "exceeded" 5) Fig. 10 - are the 5-min data in mm or in mm/h? if the latter, it should be noted on the axis title. 6) Fig. 10 - what is the explanation for the large difference between the "last 30-min" and the "next 30-min". Is it because one is observed and the other is nowcast?

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