

***Interactive comment on* “Technical note: Space-time analysis of rainfall extremes in Italy: clues from a reconciled dataset” by Andrea Libertino et al.**

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The paper presents a data-set of extreme rainfall in Italy. I believe that the information that is provided here is potentially very interesting. An important question today is whether short duration precipitation has been impacted by climate change. Extreme rainfall with sub-hourly duration is relevant for the generation of flash-flood events that are a reason of concern for small to medium size catchments, which are numerous in the Alpine region. Flash floods recently caused several deadly events in Italy whose frequency is markedly increasing in recent times, therefore pointing out the need for mitigation strategies. These latter need to be designed basing on updated information

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on extreme rainfall, with sub-hourly duration, that is rarely available. For this reason, I found this paper extremely interesting as it provides an example to follow and paves the way for elaborating and addressing very important research questions.

I believe the paper is well written and organized. I have minor suggestions to forward to the authors.

1) Abstract: I would avoid the term “explosive rainfall”. I understand the reason why the authors introduced it in the first sentence of the abstract, but I still believe that it would be advisable to use terms with a well defined technical meaning.

2) Table 1: I do not understand the meaning of “under request”. Does this mean that data are not yet available? Were the data already requested? Figure 2 shows that information for some of the regions labeled as “under request” is already available and therefore the whole picture is not completely clear to me.

3) Page 3, line 11: it is stated that “Considering that most of the provided data have been validated from the related authorities, they are considered reliable and, at first, included directly in the I-RED.” It would be interesting to discuss the validation tests that have been considered by the authorities. Extreme rainfall data may be affected by relevant uncertainty, it would be useful to mention the gauging methods, what kind of checks have been considered by the authorities and so on.

4) Page 9, line 14: “A record-breaking event is defined as the annual value that exceeds all the previous ones.” Such definition implies a greater frequency of events at the beginning of the record. Did the authors consider identifying record-breaking events by fixing a threshold for rainfall intensity, basing on information that may be extracted by the whole record of observations (without introducing any assumption on the underlying probability distribution)?

5) Page 9, line 14: it is stated that “At this stage, only nationwide record-breakings are considered, pulling up all the data together year by year.” I do not understand how

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data were pulled together. Did the authors pool together sites with different climatic behaviours? Does this mean that record-breaking events at the local level may have been discarded?

6) Data availability is a potential issue. Data-bases are useful when they are readily available. It would be interesting to discuss data availability in the body of the paper.

Overall, I am strongly in favor of publication. I believe this paper may pave the way for setting up transboundary initiatives for putting together extended information on extreme rainfall. Such data would provide an essential information for better understanding flash floods and climate change.

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