**Hydrology and
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Discussions

Interactive comment on "Observed variability and trends in extreme rainfall indices and Peaks-Over-Threshold series" *by* H. Saidi et al.

Anonymous Referee #1

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Summary: ———

The authors have digitised data for 4 stations in the northwest of Italy and are assessing trends for durations from 5 minutes to 12 hours in - seasonal and annual maxima, and - number and magnitude of exceedances of the 95th percentile. Split sample tests have been undertaken to assess differences in quantile estimates (derived using a Generalised Pareto distribution fitted to peaks-over-threshold series).

Recommendation: —————

I feel the paper requires major revisions before it is acceptable for publication.

General comments: —————-

1. The work is original only in as far as data have been digitised, and I admit this would have been a major effort. However, a fair number of plots (Fig 7, 8, 9) appear to be standard output from R libraries.

2. A map would be needed to indicate the location of stations relative to orographic barriers and how closely sites are located to each other. (It would also be helpful to provide the location of sites in Table 1 in terms of latitude and longitude.) Is the rainfall regime at these locations similar (i.e. could they be assessed jointly) or rather different (i.e. is there potential for different meaningful trends)?

3. The focus is firmly on trend detection. Little attempt is made to interpret the findings or even list the magnitude of the trends that were found to be statistically significant. The figures don't always support the findings stated in the text: It is difficult to interpret Fig 4a simply in terms of an increasing trend.

4. There is not really an attempt to define 'non-stationarity'. However, it is implied that this really only refers to trends. Aren't rainfall extremes in Italy affected by wet/dry decades (Brugnara, Brunetti, Maugeri, Nanni, & Simolo, 2012)?

5. The results appear fairly inconclusive but this could be due to the way they are summarised (under 5 Conclusions). Given the number of indices, durations and sites it is obviously not possible to discuss all combinations in the text, instead it would be helpful to summarise results in tables and/or diagrams.

6. How do the authors explain the fact that there is a significant increase in the 12-h annual maxima at Bra (Fig 2) but judging by Figure 11 quantile estimates (based on GPD) are lower for the later than for the earlier period?

7. Reference is being made to impacts on water resource management due to changes in 1h precipitation extremes. Wouldn't longer duration extremes be more relevant?

8. No attempt has been made to assess the significance of changes in quantile estimates from the earlier to the later period (for instance by constructing confidence

intervals). What is referred to as 'growth curves' are in fact 'frequency curves' (Figure 9 onwards).

9. At times it is difficult to understand the meaning of a sentence (for example line 5 page 6061) to the extent that it becomes difficult to follow the argument that is being presented.

References ———

Brugnara, Y., Brunetti, M., Maugeri, M., Nanni, T., & Simolo, C. (2012). High-resolution analysis of daily precipitation trends in the central Alps over the last century. International Journal of Climatology, 32(9), 1406–1422. doi:10.1002/joc.2363

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