

Interactive comment on “Exceptional sequence of severe thunderstorms and related flash floods in May and June 2016 in Germany. Part I: Meteorological background” by D. Piper et al.

Anonymous Referee #2

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The paper proposed by D. Piper and co-authors gives a description of the exceptional meteorological event that occurred in May and June 2016 in Germany and led to several flash flood. This event is placed within a historical context using precipitation, radio sounding, and model data of the period 1960-2014 as well as lightning data of the period 2001-2014. The authors derived from these data several indicators of convective situations or favouring convection, and computed the probability of occurrence of such an event with a particular focus on the duration of the sequence of severe thunderstorm.

I think the paper addresses relevant scientific question within the scope of NHES and that most of the review criteria are OK excepting few major and minor points I wrote

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just below.

Major comments/questions:

- Section 2.4, page 6, about the quadratic discriminant analysis, I'm not an expert on that (in particular the step corresponding to equation (2)) but I wonder if the explanations are enough accurate to allow the reproduction by fellow scientist. This analysis consists of several steps using well referenced mathematical tools but the “parameters” are not detailed, in particular for the first step partitioning the groups of convective and non-convective days.
- Section 2.6, page 7, lines 12-13: the precipitation severity (PS) index is a concept I didn't find exactly in the paper of Schröter et al. (2015). Moreover, according to equation (8), PS gives no information about persistence. Finally, the unit of R and, more importantly, Gamma need to be specified (in meter, kilometre, or squared kilometre?) to better appreciate the values given later in section 4.1
- Section 5, lines 23-26, Reference to Hess and Brezowsky (1977) and the justification for not using it were not given before in the paper. It would be better to do that before the concluding section.

Minor comments/questions:

- Section 5, lines 25: The reference to Ehmann (2009) is not available online and is written in German. For this reason and the previous one, I would replace lines 23-26 by a shorter one without these references.
- Section 2.2, page 4, line 5: I think that the information about true local time may be a little confusing and not totally useful.
- Section 2.6, page 7, line 7-8: Using Wussov criterion instead of the exceedance of appropriate percentiles implies that the criterion used is specific to the German climate. I recommend a sentence to precise that.

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- In the reference list, the name of the journal (Atmospheric Research) is missing for Brooks et al. (2003).

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