Meyer et al. 2021, “More frequent flash flood events and extreme precipitation favouring atmospheric conditions in temperate regions of Europe”- Revised version

General comments:

The authors did a good job of addressing my previous comments and have greatly improved the clarity and soundness of their manuscript. In particular, the methods are explained more clearly now and the incorporation of additional data sources and analysis has made the results more robust. I think there are still a couple of remaining issues that need to be addressed before publication, namely the following:

1) Given the temporal inconsistencies in the flash flood reports and lack of a long enough record, I do not believe the linear trend analysis of flash flood occurrence (Fig. 3a) should be included or discussed in depth. The authors even state themselves that “the dataset do not allow drawing conclusions on any robust trends”, so why include this figure given its potential to mislead readers? I think it is enough to just state that the linear trend analysis is inconclusive due to the data issues.
2) Additional clarity is needed to distinguish the precipitation events versus the subset that are associated with flash floods. I recommend something like a table to show the number of total precipitation events and the number of precipitation events that are associated with flash floods. That could help make the results more generalizable.

Specific comments:

- Lines 51-53: In the U.S., there are nice definitions of flash floods used by the National Weather Service- perhaps you can utilize that or something similar that exists in Europe? In the U.S., the NWS defines a flash flood as “a rapid and extreme flow of high water into a normally dry area, or rapid rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event” (NWS 2021.)
- Line 59-60: I do not believe this is entirely correct description of storm training- please revise this sentence to reflect that "echo training" is when convective cells move in the line-parallel direction leading to repeated cell motion over an area (Peters and Schumacher 2015):
    - Peters, J.M. and R.S. Schumacher, 2015: “Mechanisms for organization and echo training in a flash flood-producing mesoscale convective system”. Mon. Wea. Rev., 143, 1058-1085. Doi: https://doi.org/10.1175/MWR-D-14-00070.1.
- Lines 62-64: Likewise, this sentence needs revising, as forward movement is not halted. Rather the direction of the cell motion and propagation vector cancel out leading to new cells being continuously generated over the same area (Doswell et al. 1996).
- Line 103: I recommend revising this sentence because the more intense thunderstorms are actually triggered because of high CAPE **and** high CIN.
- Fig. 1d: What is this panel? It is not labeled in the figure caption. Please either omit or add its description to the caption.
- Line 150: Do the supplementary rain gauges cover the same time period?

- Line 169-170: I think it would be helpful to at least briefly describe this procedure in one sentence, like you do in the figure caption below.
- Line 175-176: How did you determine the spatial threshold of 30 km? Likewise, how did you determine the temporal threshold of one day? What happens if you have multiple hours of precipitation (which count as separate events according to your definition) and one flood?
- Figure 2: This is a very helpful figure, although I am a bit confused about the difference between the dashed and solid lines- is one dashed box an ERA5 grid cell and one solid box the multiple ERA5 grid cells used to take the atmospheric condition? If so, please make that clear in the figure description.
- Line 207: How did you obtain 0.5%? Did you calculate it yourself or did you find it in the literature?
- Line 263-264: it is difficult to tell from Figure. 4, but to me it looks like the median line for max hourly intensity is actually higher in flash flood events than for all P events- can you please see if this is true and provide numbers for these values?
- Figure 4a: I believe the text that states "P events associated with flash floods" is incorrect here, because the text states that these are all P events in the summer- is that true?
- Line 294-296: This is a very interesting result!
- Table 2: Is this table for all extreme P events or just those that are associated with flash floods? It would be interesting to show the values for both events.
- Line 389: Results are either significant or not- please pick one.
- Line 389-390: I don't believe you can state that the storm organization is unchanged, as you did not explicitly study changes in storm structure.
- Line 391: Future studies actually show a decrease in shear with warming and it would be helpful to cite those studies here (Diffenbaugh et al. 2013, Brooks 2013).
    - Brooks, H.E., 2013: Severe thunderstorms and climate change. *Atmospheric Research*, **123**, 129-138. https://doi.org/10.1016/j.atmosres.2012.04.002.
    - Diffenbaugh, N.S., M. Schere, and R.J. Trapp, 2013: Robust increases in severe thunderstorm environments in response to greenhouse forcing. *PNAS*, **110**, 16361–16366, https://doi.org/10.1073/pnas.1307758110.