We would like to thank the referee for the helpful comments, as well as for the time and effort invested in the review. Below we provide our response to the reviewer's comments and describe the modifications made to address them. In black font we include the reviewer's comments, and in blue is our response.

"The authors do not present any discussion or analysis of the numbers of storm cells per storm (average, variability)…"

Thank you for pointing this out. The average number of cells per storm could be derived from table 2, but the variability in the number of cells in storms was indeed not provided. We have added a column to Table 2 of the revised manuscript, presenting these values.

"…nor properties related to these cells "counts" such as mergers (i.e. collisions of cells) and cell splits. It seems that multicell storms, as well as the dynamics of these cells would be important (and indeed are in other climate regimes), and so the authors should at least justify omitting such analysis and, if appropriate, include it. Differences, if any exist, between the different synoptic regimes would be interesting to see"

Thank you for raising this important issue. We bring here this calculation in Fig. R1. The five possible categories in each track are displayed in the x axis, and the average relative frequency of each category is displayed in the y axis for the different synoptic types. The relative frequency is calculated for each storm event and each category by dividing the number of category occurrences in the number of tracked rain cells during the storm. The values that are displayed in the y axis are the average taken for these relative frequencies of the storms. Five categories are considered: Birth - a rain cell was created at time t, Death – a rain cell at time t was not detected at time t+1, Merge - at least two rain cells at time t were merged into one cell at time $t + 1$, Split - a rain cell at time t was split into at least two cells detected at time $t + 1$, Track - a rain cell at time t was detected along the motion vector at time $t + 1$.
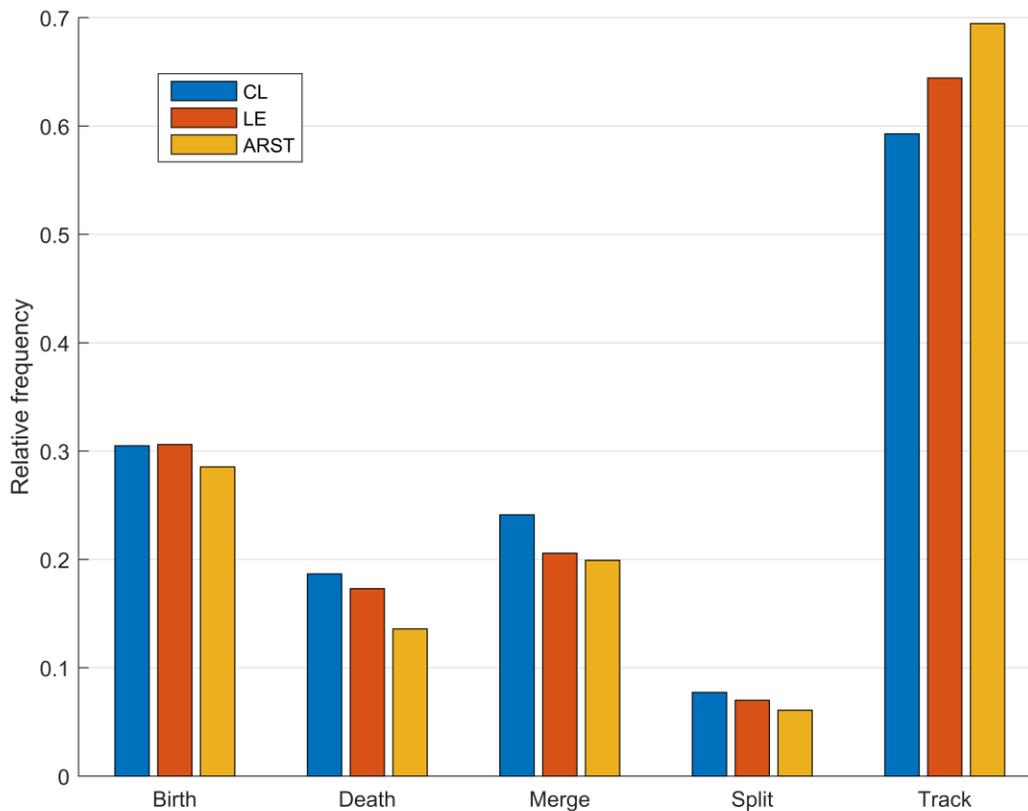
Figure R1: Frequencies of "Birth", "Death", "Merge", "Split" and "Track" categories relatively to the total number of tracked rain cells for each synoptic type.

It can be seen that the ARST events have on average more cells tracked than the other synoptic states, which corresponds with the higher average lifetime of these cells. Though some differences between the synoptic systems do exist in the relative frequency of the above mentioned categories (significant differences were found between the relative frequency of the "Track" category of the CL and LE as well as the ARST and the CL), we believe that adding this analysis have no added value for the paper. A justification for omitting this analysis is given in the revised manuscript in p5 line 14:

"Frequencies of different tracking categories during the cell's full life cycle (i.e., frequency of splits, merges and etc.) were left out of the analysis, as no added value to the presented results was given".

"The authors also do not analyze "partial coverage"-the fraction of the watershed area that is covered during each of the storm event. This would potentially help explain the results of figure 9. However, it may be the case that partial coverage is nearly 100% in many cases since the

watersheds are quite small (however, the rain cells are small as well). I recommend that the authors at least comment on this issue, and consider including such analysis."

Thank you for pointing this out. As you suspected, the partial coverage (with zero threshold of rainfall depth [mm] over a pixel) is almost always greater than 90% both in flood related rain events (in 97% of the events) and in the non-flood related events (in 79% of the events). A comment regarding the difference in the areal coverage between the two groups is given in the caption of Fig. 9 of the revised manuscript:

"The fraction of the watershed area covered during the rain event, is over 90% in 97% of the flash-flood related events and in 79% of the non-flash-flood related events."

"Figure 9 and 10 shown results for two catchments. The authors should comment on whether it is reasonable to present these results together without any way for the reader to know in which catchment each event occurred. Is there any meaningful different in the responses in the two catchments that are relevant to this study?"

Thank you for raising this important question. The two catchments are very similar in their morphological properties (e.g., climatology, location, shape, orientation of the main drainage axis). Actually, the two channels are merged together downstream to the hydrometric stations. In addition, the catchments are neighboring and quite narrow (see Figure 2 in the manuscript), and so almost all storms had rain cells covering both catchments in some point in time. Finally, the relatively small number of rain events related to flood events in each of the catchments had forced us to take both of them for the same analysis. A comment regarding presenting the results of the two catchments together is given in p8 line 26 of the revised manuscript:

"No distinction between the two catchments was made during the analysis due to their similar morphology, and their small and narrow shape relatively to an average size rain cell (Fig. 2)."

"It appears that the authors have neglected to include the criteria that was used to distinguish between flash floods and non-flash floods. If I am correct in this, the authors will need to add these criteria or at least point the reader to some other reference."

The criteria used to distinguish between flash-floods and non-flash floods are provided in section 2.2. We now added a comment to the revised manuscript about the thresholds used for this separation on page 8, line 25:

"A flash-flood was defined when a flow higher than the criteria specified in Section 2.2 was measured in at least one of the neighboring catchments."

"The authors should make clear what the distinction between "lifetime" and "duration" is. I'm guessing that lifetime the length of each cell while duration is the length of the storm system. However, the reader should not need to guess at these things."

Thank you for pointing this out. Indeed, these terms were not properly presented. A comment regarding this distinction was added on page 5, line 13:

"In this paper, the term "lifetime" relates to the length of the individual cell's life, while "duration" to the length of the rain event."

"Figure 10: What is the diamond in each boxplot (I'm guessing it is the mean, but this should be made clear)? More importantly, what are the p-values that are reported? It is unclear from the figure, caption, and main text what hypothesis test is used and what is being compared (i.e. means, distributions, etc.). Also, is the cell area that is reported the average area per time step or for entire cell lifetime?"

Thank you for pointing this out. Indeed, the meaning of the diamond and the hypothesis test used in this analysis was forgotten to be mentioned. This is added to the caption of figure 10 of the revised manuscript ("Box-plot properties are as specified in Fig. 5. Reported P-values are of the ANOVA test applied between dominant flash-flood related cells and non-flash-flood related cells. All data sets were tested first for variance heterogeneity using Levene's test (with squared deviations). Box-Cox transformation technique was applied to properties of unequal variances to obtain normality. In these cases, Welch's test was used."). The cell area that is reported is the average for the entire cell lifetime. We believe it is clear from section 4 in the following sentence: "The average properties characterizing the dominant cells of flash-flood and non-flash-flood events during their lifetime over the catchments were compared".

"Table 2: Somehow, it should be indicated that the values in parentheses are standard deviations (well, that is I assume those values are, it needs to be clarified-probably in the caption)."

Thank you for pointing this out. We have rephrased the caption of table 2 to: "Table 2: Mean and standard deviation (in parentheses) of spatial and temporal properties of events and derived convective rain cells." and we hope it is clearer.

"Page 9 line 3: Really, Figure 10 shows more than just the "average properties"-it shows mean, median, and interquartile ranges."

Thank you for pointing this out. True, figure 10 shows more than the mean of these properties. We have now edited this sentence to: "The mean, median and interquartile ranges of the properties characterizing the dominant cells of flash-flood ".

"Section 2.2: why avoid analysis of low flows? Are there major rain events that do not cause large flood responses?"

We avoid analysis of low flows in order to consider and analyze only flash-floods. We did saw some major rain events that did not cause a large flood response (see figure 9 in the manuscript).

We would like to thank the referee again for the detailed review. All typographical errors were corrected in the revised manuscript.