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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Radar-derived convective storms climatology for Prut River Basin: 2003–2017" *by* S. Burcea et al.

Anonymous Referee #1

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The manuscript investigates convective activity 15-years climatology in Prut basin, Romania analysing a dataset derived from Storm Cell Identification and Tracking (Johnson et al., 1998) applied to the WSR-98D weather radar located in Barnova, Iasi, Romania. After data quality check to avoid artifacts or non-convective echoes, the authors discuss temporal (yearly, monthly, hourly) and spatial distribution of convective cells. Then, storms properties like mean displacement, VIL and other cell attributes are investigates by statistical analysis. Finally, the authors investigate relationships between basin-averaged number of storms and observed precipitation and spatial and temporal variability using EOF technique. Given duration of the observed data, ranging from 2003 to 2017, the topic addressed in the proposed work is valuable. Nevertheless, the authors report a basic statistical analysis, providing mean values and other statistical

moments with very few physical explanations or interpretations. Most of the authors' findings (e.g. storm annual, monthly or hourly behaviour) confirm well-known results in previous work (Goudenhoofdt and Delobbe, 2013). The language is poor, quite unclear, with several misspellings and it needs a deep revision. For example at page 3 line 28: "The Prut River basin is situated in the coverage are of the Weather...", or at page 4 line 14 "1st of May 2003" (repeated at page 18).

Hereafter, specific comments for each Section, Table and Figures are reported.

Section 4.1 Here, annual, monthly and hourly storm distribution is analysed. A description of statistical results is reported, confirming well-known storm characteristics (convection on May-August and during afternoon or evening). But if we wish to move further some questions are to to be answered: - are there any Prut basin peculiarities respect other places? - on 2016 an abrupt increase has been recorded: is there any explanation? - As mentioned, the year 2003 was peculiar: it is worth providing deeper explanations (synoptic conditions, atmospheric circulation anomalies over Europe) - The maximum number of storm was reached on 2016: did it happen only in Prut basin? The summer 2016 was quite rainy in large part of Europe.

Section 4.2 There are years with relatively uniform distribution of storm, while other years "hot-spots" appear: is there any link to synoptic atmospheric circulation? How can we explain this behaviour?

Section 4.3 Here, storm properties are investigated. First of all, average values are reported like the average speed, average distance: how many are the significant figures (e.g. 34.7 km and 11.4 m s-1 line 29 page 7)? The spread of sample data should be taken in account. Again, there are inter-annual variation in average value: an attempt to explain these results is needed. The authors divide storm in groups: how the criteria adopted to group data are chosen is unclear. Different storm speeds are found depending on direction: the relationship between this finding and atmospheric circulation should be investigated.

Section 4.4 In this section, storms and related precipitations over Prut basin are investigated. This is section the most unclear in the paper. Which is the aim of this analysis? Is it to investigate cloud precipitation efficiency? Why are weather radar-based QPEs not used? The spatial resolution of CRU dataset used is so large (50 km) that it is hard to correlate with phenomena like storm (few kilometers extent). Is it the trend in precipitation – number of storm statistically meaningful? A possible physical explanation for this result should mentioned, at least.

Section 4.5 Is the increase in the period shown by EOF analysis statistically meaningful? Figure 14 shows that the second EOF on 2013 differs from other years: is there an explanation?

Table 1

According to variables sampling distribution, median estimator is recommended as more robust than the average. The significant figures must be checked according to data spread.

Table 2

Please, check Group 3 column.

Figure 6-7 To compare year-by-year the same colour scale, number of classes and classes values for each year is recommended.

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