Trends of climate variability in Central Europe in the past 200 years – derived from early-instrumental monthly time series.

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Public climate change discussion often claims an “increase of climate extremes” already to be observed. In most cases, the subject it is not precisely defined and therefore not easy to be supported or rejected by scientific analysis. Therefore, the proposed contribution wants to precisely define its topic. We use a new dataset (HISTALP) covering the “greater Alpine region” (GAR). The dataset is based on monthly instrumental climate data, carefully, homogenised and outlier corrected. It is described in a poster in session AC07. For the three leading climate elements, air pressure, temperature and precipitation, many series extend back into the early instrumental period, some into the 18^{th} century. An early series subset is used to analyse the evolution of the range of high frequent variability. To overcome problems related to non Gaussian distributions and in order to exclude any influence of existing climate trends, we used interquantile ranges of detrended series in moving windows of 30 years. To avoid any influence of a variance increase due to decreasing number of series when proceeding back in time, we performed the analysis on each single series and not on regional means.

The results are maybe astonishing for someone not familiar with climate in the early instrumental period. From the 19^{th} to the 20^{th} century there has been a prevailing and significant decrease of temperature variability, independent from the choice of the range (80%, 90%, 95% and the outliers beyond) and stable also in terms of different subregions. For precipitation we found different subregional and seasonal trends, but more decreasing than increasing evolutions. Air pressure takes a position between: a clear dominance of variability decreases, but a strange different winter evolution, which then also influences the annual results due to the much higher variability of air pressure in winter. The results are similar (but as a matter of fact less significant) for the recent decades which may be under anthropogenic influence already.

We clearly state that our study is not dealing with extremes based on daily or subdaily data, for which we regard the still existing and not easily solvable data availability, homogeneity and general quality problems to hamper similar analyses. But we are also convinced that a number of extreme climate events and impacts like hot summers, large scale flooding events, major droughts and others are well captured by monthly data. Therefore we regard our results to be well usable as argument in a topic of main interest in a region to be claimed of high climate sensitivity and vulnerability.