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Variability of the temperature extremes in Romania

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While long-term scenarios indicate for Romania increasing temperatures, wetter winters and drier summers, there is a growing scientific and media interest in the behaviour of the climatic extremes. This paper aims at assessing the temporal and the regional variability of temperature extremes in Romania.

The analysis is based on daily data from more than 60 weather stations, covering the whole territory, along the interval 1961-2003. ClimDex has been used to get relevant indicators for describing the temperature extremes. The research focuses on the following indices: annual number of days with temperatures equal to or below 0˚C, annual extreme temperature range, growing season length, heat wave duration index, percent of time with the maximum daily temperature equal to or below the 10^{th} percentile of the row, percent of time with the maximum daily temperature equal to or above the 90^{th} percentile of the row, percent of time with the minimum daily temperature equal to or below the 10^{th} percentile of the row, and percent of time with the minimum daily temperature equal to or above the 90^{th} percentile of the row, annual number of days with temperature above or below certain thresholds.

The statistical significance of the shifts in the mean and linear trend is analysed using two non-parametric tests: Mann-Kendall and Pettitt. The spatial variability of each parameter is evaluated through GIS-based interpolation techniques.

Results suggests that there is a significant positive trend in the evolution of some indices defining a warming process (i.e. heat wave duration index, annual number of days with minimum temperature $>20^{\circ}$C etc.). The regional differences are rather quantitative than qualitative, indicating the large scale of the process.