Large-scale atmospheric circulation patterns in relation to Central European temperature and precipitation extremes

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Analyses are based on daily temperature and precipitation time series compiled during the EU project EMULATE and on daily mean SLP fields reconstructed back to 1850 during the same project. Extremes in temperature and precipitation are defined on a seasonal basis in terms of particular percentiles (the 2nd, 5th, 95th and 98th for temperature, the upper ones for precipitation). Relationships to the large-scale atmospheric circulation are identified by different approaches: i) based on SLP pattern classifications - achieved by simulated annealing clustering techniques or by an objective assignment to Central European Grosswettertypes - those circulation types will be determined having higher percentages among extreme days than among non-extreme days; further characterizations will be derived in terms of within-type variability. ii) The daily mean SLP fields from all days with a particular seasonal extreme including the four preceding days of each extreme event will be submitted to extended principal component analyses in order to determine the major sequences of daily circulation patterns being related to these extreme events. Examples from Central Europe for different seasons will be presented.