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The estimates of probability distribution of annual and seasonal maxima of maximum air temperature

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Extreme weather events are of particular interest in many sectors of human activities. Possible shifts in their occurrence can have serious impacts. Before we can make trustworthy conclusions regarding this topic, we must be sure, that the statistical methods we use for the analysis are robust. The aim of our research is to examine how the methodology can impact the estimates of return periods of air temperature extremes. Present study concentrates on extremes of daily maximum air temperature observed in the Czech Republic in the period of 1961 – 2010. The generalized extreme value (GEV) distribution is fitted to samples of annual and seasonal maxima at individual stations. The GEV parameters are used to estimate return periods of selected extreme values observed at the station of interest. We then repeat the procedure, leaving out one year of observations each time, until the resulting length data sample is 15 years. The influence of length of data time series on resulting estimates of GEV distribution and return periods is analyzed. Further, we compare the results obtained using the maximum likelihood method and the method of L moments. We show results for selected stations that have complete time series for the whole 50 year period. The stations are situated in different altitudes and different climatic regions. The work has been supported by the grant P209/11/1990 funded by the Czech Science Foundation.