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Winter minimum and maximum air temperature in the Czech Republic

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A lot of attention has recently been paid to analysis of extreme weather events and frequency of their occurrence. Possible shifts in weather extremity and resulting increased risk in many sectors can have serious impacts on both human society and natural ecosystems. Extreme values of air temperature during winter can e.g. influence the sectors of power engineering, transportation, industry and agriculture. In present study we concentrate on characteristics of minimum (Tmin) and maximum (Tmax) air temperature during winter seasons of 1961-2010 in the Czech Republic. Besides the extreme values of Tmin and Tmax we also analyze the events of sudden air temperature drops. We use all available data from the database of the Czech Hydrometeorological Institute, including measurements of more than 200 stations from altitude range 150 - 1320 meters above sea level. The generalized extreme value (GEV) distribution is fitted to samples of seasonal extremes. GEV parameters are used to estimate return periods of daily observations. We analyze temporal evolution of the return periods in recent decades. We also show spatial analysis of selected most extreme events. The work has been supported by the grant P209/11/1990 funded by the Czech Science Foundation.