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Evaluation of temperature extremes from an ensemble of transient RCM simulations driven by several AOGCMs

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In this study, applying an ensemble of regional climate model (RCA3) integrations driven by several AOGCMs, we investigate possible changes in return values of annual maximum and minumum temperature over Europe between recent (1961-1990) and future (2071-2100) climate under the SRES A1B scenario. A common method to fit the Generalized Extreme Value (GEV) distribution to annual extremes assumes stationarity of the analyzed extremes, i.e. the GEV distribution parameters (location, scale and shape) do not change with time. However, in transient climate simulations, when the greenhouse forcing gradually changes, the assumption of stationarity is not necessary valid. In order to take into account the non-stationary nature of extremes in transient simulations two methods (time slices and time-depended parameters) for estimating the return values of the annual temperature extremes are examined. The difference in the return levels between these two methods are discussed and compared to differences among members of the ensemble.