RegCM performance in reproducing the characteristics of Romanian climate variability

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The simulations of the ICTP regional climate model RegCM for spatial resolution of 50 km (RegCM-50) and 25 km (RegCM-25) were analyzed regarding their performance in reproducing the characteristics of climate variability in Romania for the 1961-1990 period. The fields of seasonal precipitation amount, mean seasonal temperature and mean maximum temperature (only RegCM-25 simulations) were considered in this analysis. It was found that the RegCM-50 overestimates the mea precipitation over Romania during all seasons except for summer. A finer spatial resolution (RegCM-25) leads to much more overestimation for the mountain areas but an improvement has been obtained over the south-eastern/eastern regions during winter, spring and autumn. Regarding the maximum temperature, the RegCM-25 overestimate the seasonal means for all seasons but reproduces well the spatial variability. In order to explain the possible reasons for these findings, the RegCM capability to reproduce the large-scale mechanisms controlling the Romanian precipitation variability given by CCA (canonical correlation analysis) as well as the characteristics of the atmospheric circulation on European scale (given by EOF), are also analyzed. The CCA is performed between combined vectors of various large-scale fields (sea level pressure, geopotential heights, geopotential thickness, and humidity) and local/regional fields (temperature, precipitation).