

## Validation of a Regional Climate Model Version 4.4 (RegCM4.4) for the Territory of Bulgaria

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**Abstract.** This paper presents a validation study for the Regional Climate Model Version 4.4 (RegCM4.4) over the territory of Bulgaria ( $41^{\circ}\text{N}$  –  $44.5^{\circ}\text{N}$ ,  $22.5^{\circ}\text{E}$  –  $28.5^{\circ}\text{E}$ ). The horizontal grid spacing of the model is 20 km. The ability of the model to capture temporal and spatial variability of temperature and precipitation over the region of interest is evaluated using monthly mean CRU TS3.20 ( $0.5^{\circ} \times 0.5^{\circ}$ ) data. The simulated period is 1983–2012 (30 years). RegCM4.4 shows small temperature biases but a general overestimation of precipitation, especially in spring. The analysis is performed for the annual temperature and precipitation, as well as for the averaged temperature and precipitation over four seasons separately. The model simulations are better in spring and autumn for the temperature, however in summer and winter the errors are larger. The precipitation is simulated better for summer and autumn. The results show that inter-annual variations of both temperature and precipitation is captured adequately from the model. The same is valid for the seasonal temperature and precipitation variations. Simulated monthly mean temperature and precipitation show high correlation with observations, with correlation coefficients of 0.99 and 0.7 respectively.