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Assessment of the simulated climate in two versions of the RegT-Band

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This study evaluates two simulations carried out with the tropical band version of the Regional Climate Model (RegT-Band). The purpose was to compare the performance of the RegCM 4.4.5 and 4.6 versions (RegT4.4.5 and RegT4.6). The domain used in the simulations extends from 45° S to 45° N and covers all tropical longitudes, with grid spacing of ∼39 km, 18 sigma-pressure vertical levels. The initial and boundary conditions for the simulations were provided by ERA-Interim reanalysis and the analyzed period is from January 2005 to December 2008. Regarding the physical parameterizations schemes were used the Emanuel scheme to solve cumulus convection and Community Land Model version 4.5 (CLM4.5) to surface-atmosphere interactions. Seasonal simulated precipitation was compared with Global Precipitation Climatology Project (GPCP) while 2 meters air temperature with ERA-Interim reanalysis. The main results of this study are that RegT4.6 reduces the wet bias over the oceans and the cold bias over the continents compared with RegT4.4.5. In austral summer, RegT4.6 improves the simulation reducing the precipitation amounts mainly over Indian Ocean, Indonesia and eastern northeastern Brazil. However, both versions underestimate the precipitation over the South America Convergence Zone (SACZ). During the austral winter, RegT4.6 simulates the precipitation similar to GPCP over India and it reduces the cold bias over this country compared with RegT4.4.5. However, over the South of Africa, Australia and central-southeast South America, RegT4.6 simulates a strong warm bias.