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# Performance of two land surface schemes coupled in RegCM4.6 in simulating local and mesoscale climate features over southeastern Brazil during 2010

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This work presents a comparison of two land surface schemes (BATS and CLM4.5) coupled in RegCM4.6 to simulate the local and mesoscale features of the climate over southeastern Brazil. RegCM4.6 simulations nested in ERAINTERIM reanalysis were done for the very wet year of 2010 and both used 5 km of grid spacing. It is important to highlight that in RegCM-CLM4.5 simulation the urban effects were solved. Simulations are evaluated by comparisons with TRMM rainfall estimation and local observed data at metropolitan region of São Paulo city (MRSP). For all southeastern Brazil, the CLM4.5 simulation produces more intense daily rainfall events than using BATS scheme, resulting in larger agreement with TRMM estimates. The main patterns of mean near surface circulation (10 m wind) and rainfall are similar in CLM4.5 and BATS and they are able to simulate the observed mesoscale features of the climate as: the land-sea breeze along the shore and the valley-mountain breezes. CLM4.5 simulates higher temperatures and rainfall rate than BATS over MRSP, which can be the response of the urban effects simulated in CLM4.5. Comparatively, the southeast winds (sea breeze wind) and continental northwest winds are more intense in CLM4.5 than in BATS, which contribute for stronger wind convergence and increases the precipitation rate over the MRSP. At local scale, CLM4.5 shows large agreement with the observations than BATS in simulating the diurnal cycle of the meridional wind. In other words, CLM4.5 is able to simulate the correct time of wind change, from north to south, which is characteristic of the sea breeze observed in MRSP.