Mean annual cycle of precipitation simulated by CMIP3 and CMIP5 models over the Iberian Peninsula

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In this study, we examine the ability of a large set of climate models in simulating the mean annual cycle of precipitation over the Spanish Iberia. The assessment of the skill of the climate models is a very important topic for the future climate projections given that our region is actually a hot-spot region. We have considered monthly precipitation data from the twentieth century climate simulations from the Climate Model Intercomparison Project Phases 3 and 5 (CMIP3 and CMIP5), participating in the IPCC′s Fourth and Fifth Assessment Reports (AR4 and AR5). These data have been analyzed and compared with observations and re-analyses. In the former case, we have used a new available high-resolution daily precipitation gridded dataset developed for peninsular Spain and the Balearic Islands, dataset henceforth referred as Spain02 as well as the dataset generated by the Climate Research Unit (CRU), University of East Anglia (United Kingdom) whereas in the latter case, two re-analysis ERA40 and NCEP-NCAR have been taken into account. Models tend to smooth the annual cycle, underestimating, in general, the precipitation in the rainy season whereas overestimating it in the dry season. As a matter of fact, CMIP5 models depict lower biases than CMIP3 models in the mean precipitation annual cycle; though some changes affecting the sign of bias have been observed.