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Preliminary analyses of the observed and simulated extremes of rainfall in the IPCC-AR4 models

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The climate projections of the Fourth Report of the Intergovernmental Panel on Climate Change (IPCC-AR4) show some changes in patterns of surface temperature and precipitation and an increase in the frequency of extreme events. In this work we present the ability of the IPCC-AR4 models in represent the heavy precipitation events over the South American continent. The analyses were performed by comparing the simulations with the Global Precipitation Climatology Project (GPCP) data during the present climate period from 1979 to 2010. For these preliminary comparisons three ocean-atmosphere coupled models were considered: CSIRO-Mk3.0, HadCM3 and the GFCM20. The selection of extreme events was based on the calculation of percentiles of the temporal distribution of precipitation for each grid point considering the intense precipitation values above the 95th percentile. The preliminary results show that the GFCM20 and HadCM3 models well represented the pattern of heavy precipitation over the continent. However, the CSMK3 model shows deficiency in simulate the extremes compared with the observations and the previous models. The results suggests that the GFCM20 and HadCM3 models are efficient numerical tools to advance in researches related to the impacts of the climate change on the heavy precipitation over the South America.

KeyWords: extremes rainfall; climate projections; IPCC-AR4 models