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a) Seasonal simulation of extreme events over South America using a mixed physics ensemble approach:

The seasonal forecasts of precipitation and temperature on a regional scale are very useful, mainly for the regions affected by extreme events: such as droughts and floods. These events are commonly associated to global scale phenomena (e.g.: El Niño/South Oscillation). The aim of this work is to improve the performance of seasonal regional forecasts of extreme events over South America using a mixed physics ensemble approach. For this purpose, seasonal simulations using the ETA regional model (ETACLIM) of the Center for Weather Prediction and Climatic Studies (CPTEC) were carried out. The microphysics and convection schemes available in the model were used to constitute the members of the ensemble. The model is initialized and updated at the lateral boundaries by the National Center for Environmental Predictions (NCEP) / Department of Energy (DOE) reanalysis II data each 6 hours. To evaluate the performance of ensemble mean, spread and probability comparisons between the simulation with Global Precipitation Climatology Project (GPCP) and Climatic Research Unit (CRU) data will be done, for precipitation and air surface temperature respectively.

b) Effects of spectral nudging technique in regional climate model simulations over South America:

In this topic it is proposed to describe the effects of the spectral nudging technique in regional climate model simulations over South America. At CPTEC the regional climate model RegCM3 will be integrated for austral summer season of 1998/El Niño and 1999/La Niña. The NCEP/DOE reanalysis II will be used as initial and boundary conditions. The difference between the control and sensitivity experiments are used for default settings and spectral nudging technique, respectively, to create the boundaries conditions. When used this in last option the rainfall simulations for both summers are in better agreement with observations rather than the control experiment. The improvement of simulations using the spectral nudging technique with this model show their applicability for regional climate studies.