

Evaluation of the AGCM-CPTEC air temperature forecasts during an El Niño event

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The air temperature is one of the main climatic elements and exerts great influence in many sectors of the society. Reliable forecasts could supply mechanisms to the population to avoid adverse effect associated with temperature extremes. Moreover, a realistic representation of the diurnal cycle for the air temperature near the surface is one of the basic requirements for numerical model prediction performance. The diurnal variation of the forecast errors might supply informations about problems associated with physical process parametrized. It is very important evaluate extreme events associate with high temperatures. Between January 20th and February 05th 2003 occurred an intense heat wave over Northern Argentina and Southern Brazil that persisted for more than 9 days. During this period the atmosphere general circulation was driven by a weak El Niño and in the mesoscale was observed an occurrence of a South America Low-level Jet (SALLJ). The objective of this study is to evaluate the 2 meters temperature forecasts (T2m) and temperature in the first sigma level (Tems) from the Atmospheric Global Circulation Model (AGCM) of the Center for Weather Prediction and Climate Studies (CPTEC) for the considered period. It is used the CPTEC regional Eta model reanalysis for comparisons. The wind fields in 850 hPa and 500 hPa from the reanalysis and the AGCM forecasts was analyzed to verify the occurrence of the SALLJ according to Bonner's Criterion 1. In the reanalysis wind fields, the SALLJ was present between 20th to 23rd January and 31st January to 05th February. In the first period the SALLJ Maximum Wind Core (MWC) was localized over the Bolivia. In the second, the MWC was localized over the Northern Argentina and Paraguay. The T2m field shows relatively higher temperatures since the Northern Bolivia until the Northern Argentina almost every considered period. In the wind in 850 hPa 24-hour forecasts was verified that the CPTEC-AGCM predicted the SALLJ in the correct position, but it underestimated the MWC intensity. To T2m and Tems forecasts was verified that the region of relatively higher temperatures over the Northern Argentina and Paraguay was well captured by the model during all period. However, the Tems overestimated the values observed in reanalysis, while the diagnosis of T2m agrees better with the reanalysis. The results indicate that the CPTEC-AGCM 24-hour forecasts captured the SALLJ and the heat wave relatively well during the considered period. The implementation of the T2m diagnosis contributed to improve the model prognostics of temperature.