

Data Assimilation at CPTEC/INPE during the period of SALLJEX



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ABSTRACT

The additional SALLJEX soundings are included in the data assimilation system of CPTEC to prepare the initial conditions used to integrate the Atmospheric Global Circulation Model. One of the purposes of assimilating these data is to assess their impact in the initial condition and to provide a reanalysis set for the period of the experiment. The reanalysis showed an increase in the intensity of the northerly flow and in the humidity over Bolivia, Paraguay and Argentina. The preliminary results show the importance of the SALLJEX data in the analysis. This work will also serve as a 'proof of concept' for a longer term reanalysis project for the South America.

INTRODUCTION

To produce an accurate weather forecast, precise knowledge of the current state of the atmosphere (the initial condition) is needed. This is achieved by using observations and assimilating those observations into the model.

The procedure of the assimilation scheme is to blend observations with a short term forecast (6 hour) producing a grid estimate of the state of the atmosphere. The scheme implemented at CPTEC is the Physical-space Statistical Analysis System (PSAS), developed at the Global Modeling Assimilation Office (GMAO/NASA) (Cohn et al. 1998). PSAS is a global analysis system with characteristics of 3D-VAR and Optimal Interpolation, in which the minimization is performed in the physical space, rather than in a model space.

DATA AND METHODOLOGY

Extra data of SALLJEX soundings were included in the data assimilation system of CPTEC to prepare the initial conditions used to integrate the Atmospheric Global Circulation Model. The additional soundings were made in areas where there is a lack of conventional data (Fig. 1): Rio Branco and Dourados (Brazil), Santa Cruz (Bolivia), Resistência and Santiago del Estero (Argentina) and Mariscal Estigarribia (Paraguay).

The scheme runs with the spectral Atmospheric Global Circulation Model CPTEC/COLA, with resolution which corresponds to 100 km in the horizontal and 28 levels in the vertical (T126 L28), using sigma coordinate (See Cavalcanti et al. for details). The global dataset used in the assimilation system is obtained from the GTS (T, P, u, v, q), ATOVS (T, q), QuikScat (u, v over the ocean surface) and TPW.

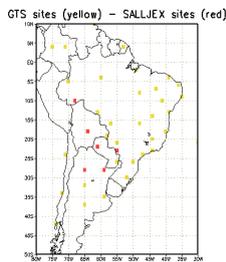
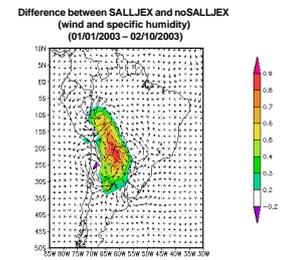
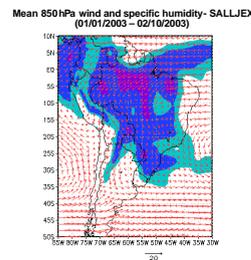
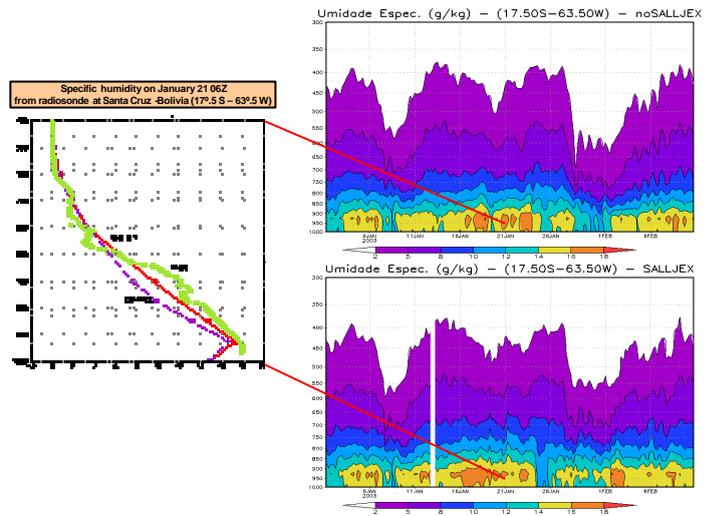
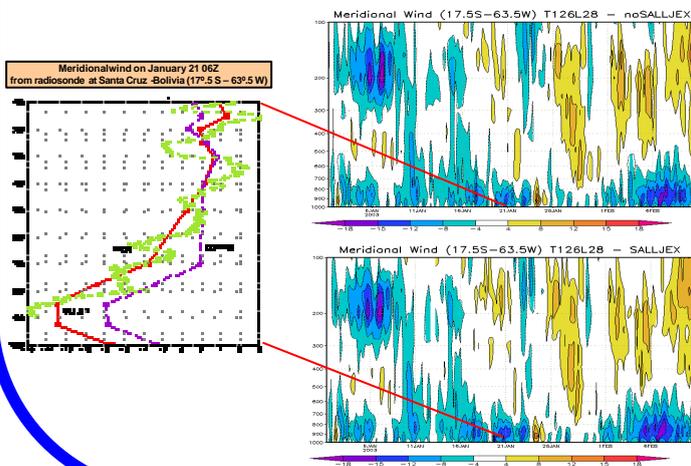
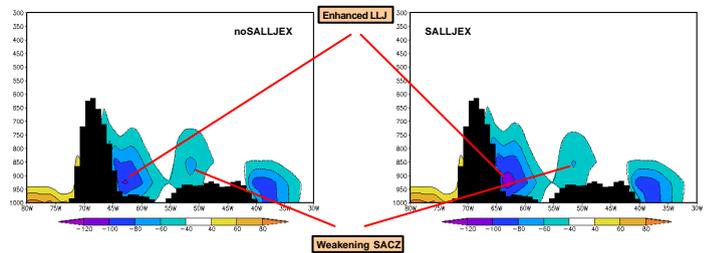


Fig. 1: Location of GTS data (yellow) and SALLJEX data (red).

PRELIMINARY RESULTS



Cross section of mean moisture flux (vq) at Santa Cruz (17.5 S)



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