

# *SALLJEX Data Assimilation*

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# Objective

- To Prepare Initial Conditions to Model Runs Using the SALLJEX Data
- To Analyse the Impact of these data on the Forecasts
- To Provide the Reanalyses to the SALLJEX Dataset

# Assimilation System at CPTEC

- Physical-space Statistical Analysis System -PSAS
  - Model
    - AGCM CPTEC/COLA
    - Regional ETA

# Assimilation January 2003

## ATMOSPHERIC GLOBAL CIRCULATION MODEL

- Horizontal - ~ 100 Km x 100 Km (T126)
- Vertical - 28 levels (L28)
  - control experiment
  - including SALLJEX data

# Analysis Definition

A procedure to blend observations and a short-term forecast (6 hours) producing a gridded estimate of the state of the atmosphere.

$$\omega^a = \omega^f + K(\omega^o - H\omega^f)$$

where:

$w^a$  : analysis state vector

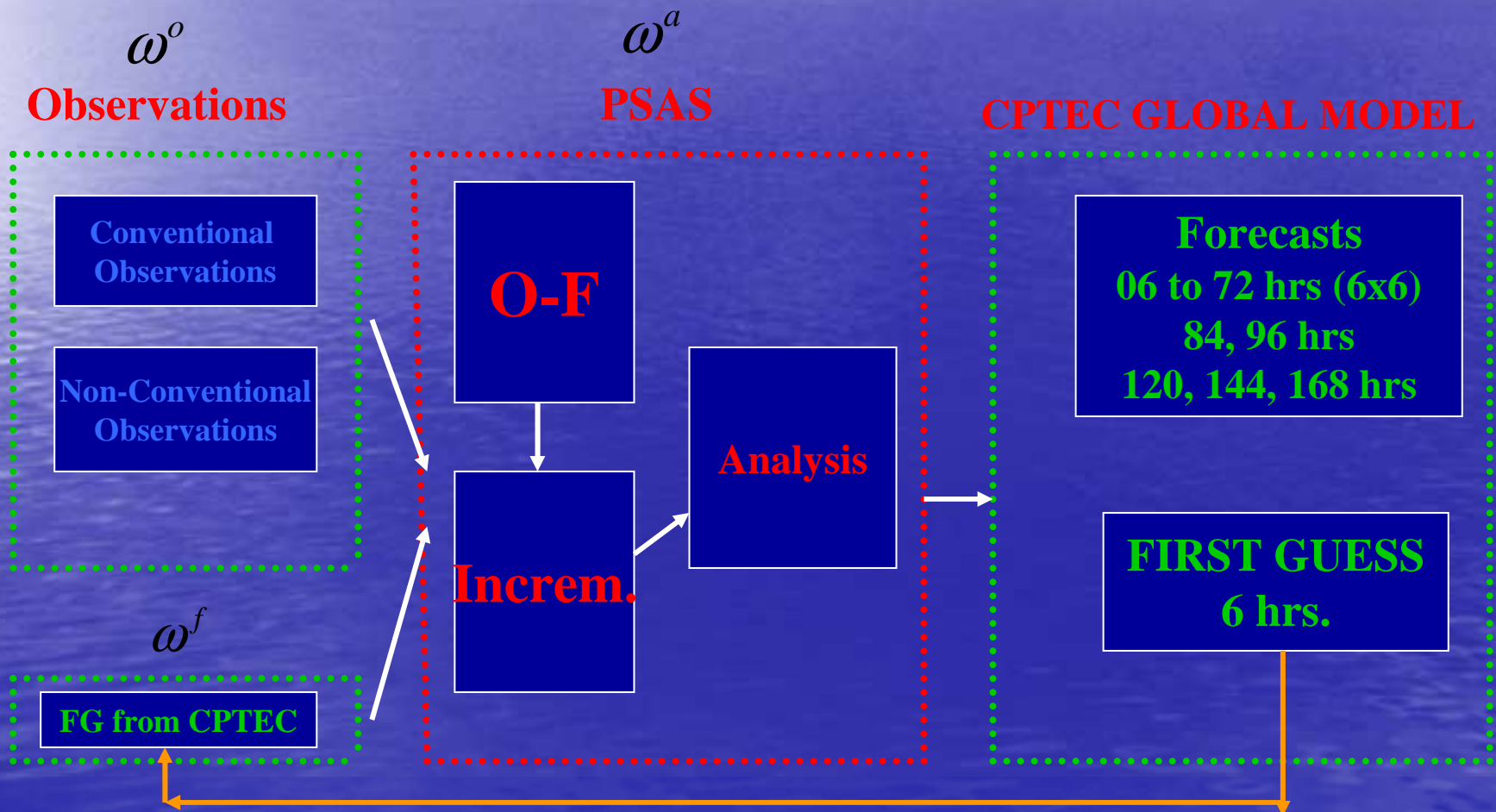
$w^f$  : forecast state vector

$w^o$  : observation vector

H : observation operator

K : weight ("gain") matrix

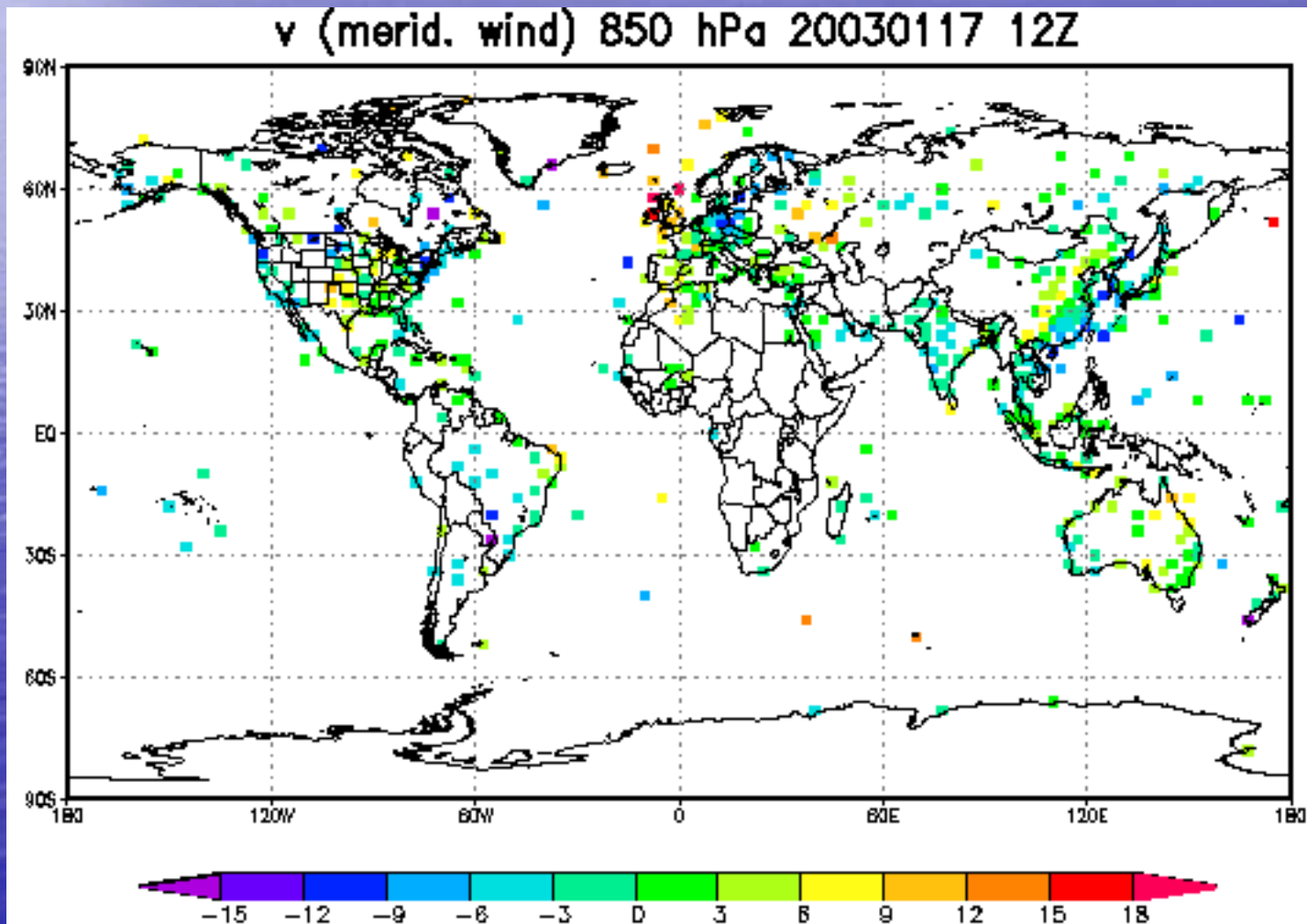
# PSAS/CPTEC Analysis



# Data Used

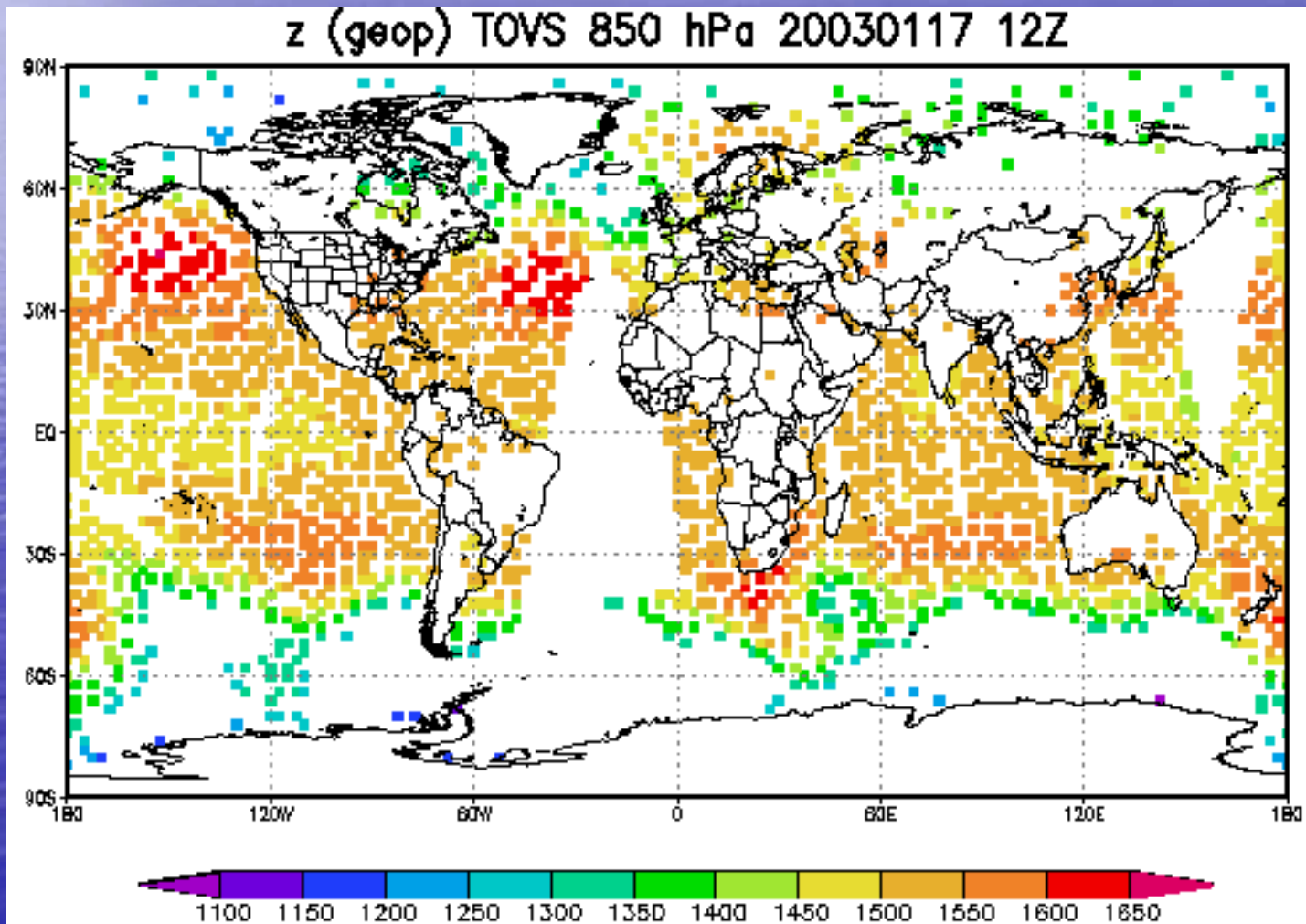
- Conventional Data from GTS (T, q, u and v , slp)
- QuikScat Data (u and v over the ocean surface)
- Total Precipitable Water (TPW)
- ATOVS (Temperature and humidity)

# Conventional GTS



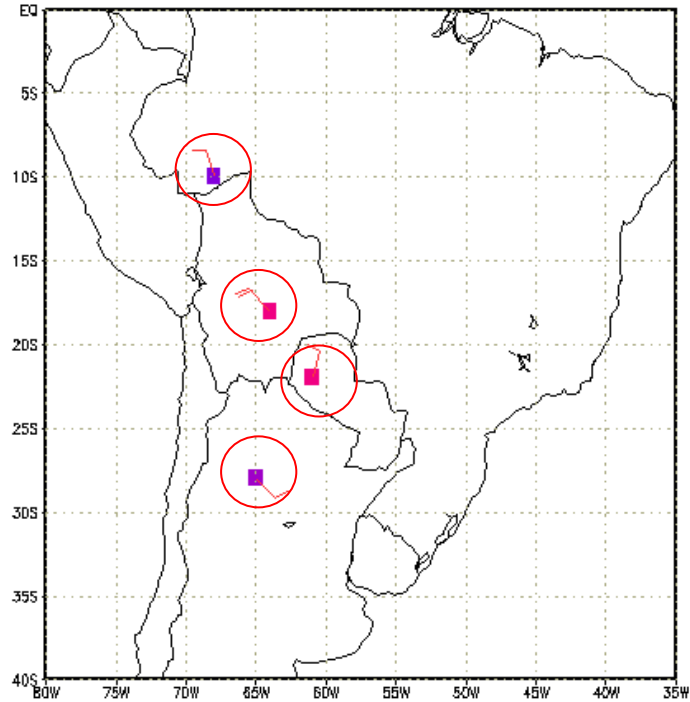


# ATOVS

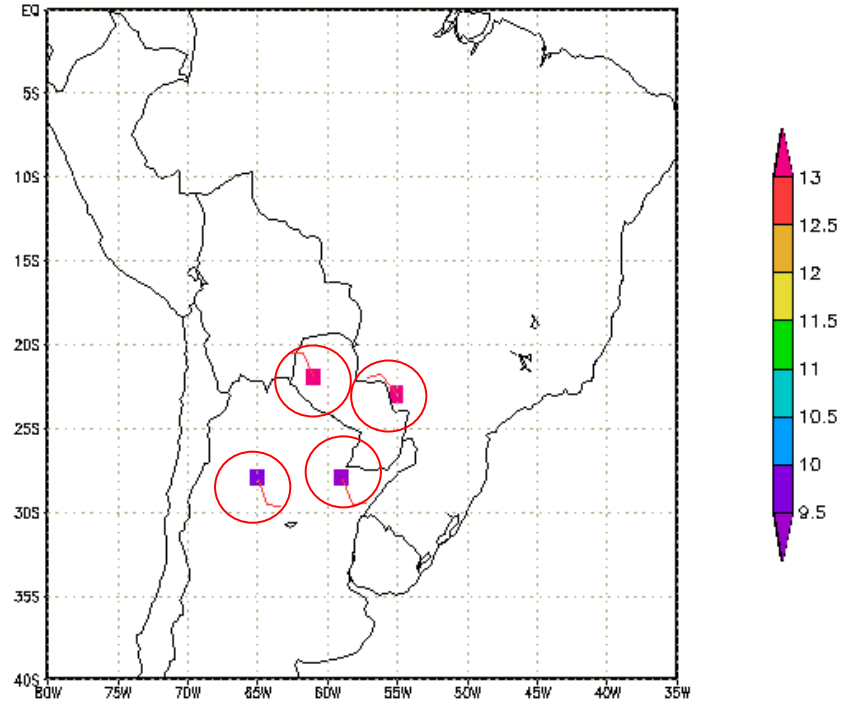


# SALLJEX Dataset

V (m/s) - r (g/Kg) (shaded) - Jan 22 18Z - 850 hPa

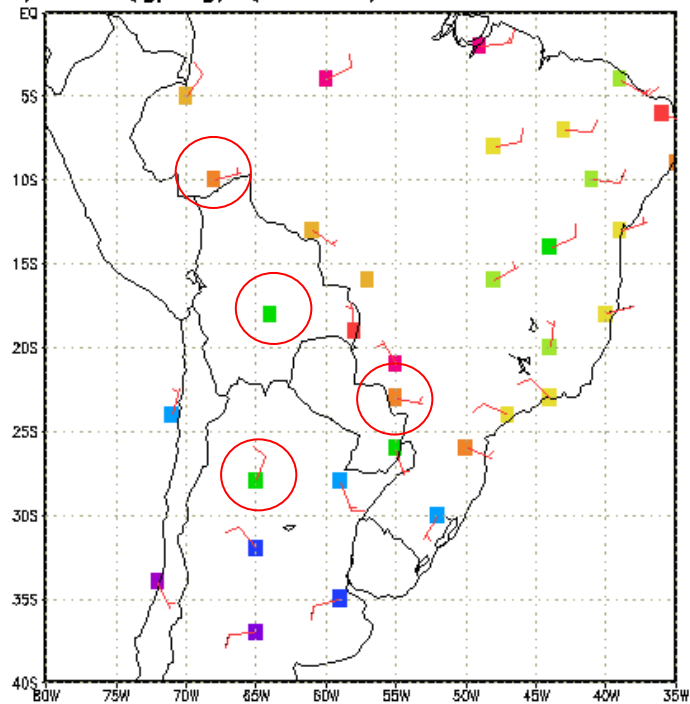


V (m/s) - r (g/Kg) (shaded) - Jan 23 06Z - 850 hPa

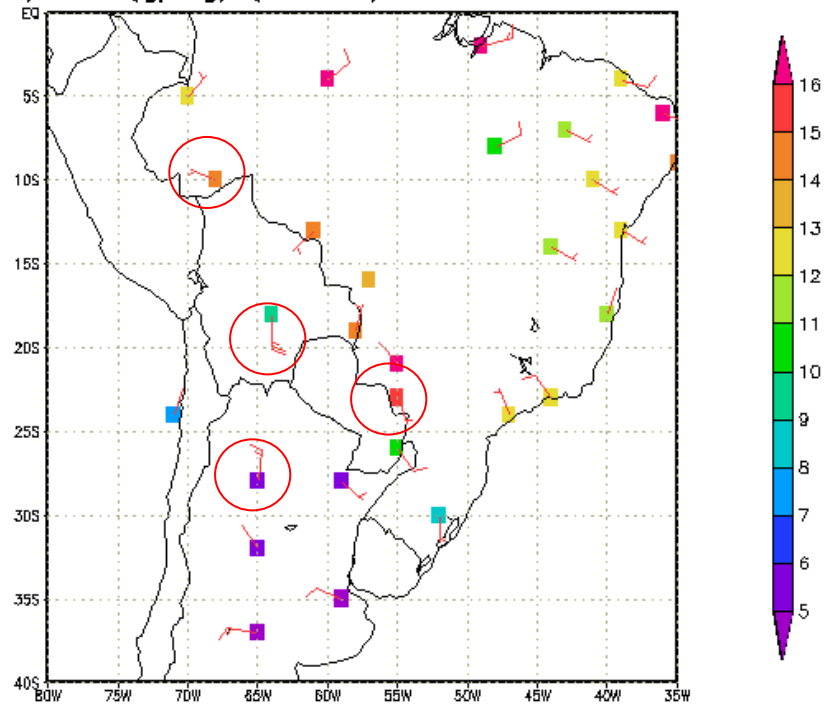


# SALLJEX and GTS Dataset

V (m/s) - r (g/Kg) (shaded) - Jan 24 12Z - 850 hPa

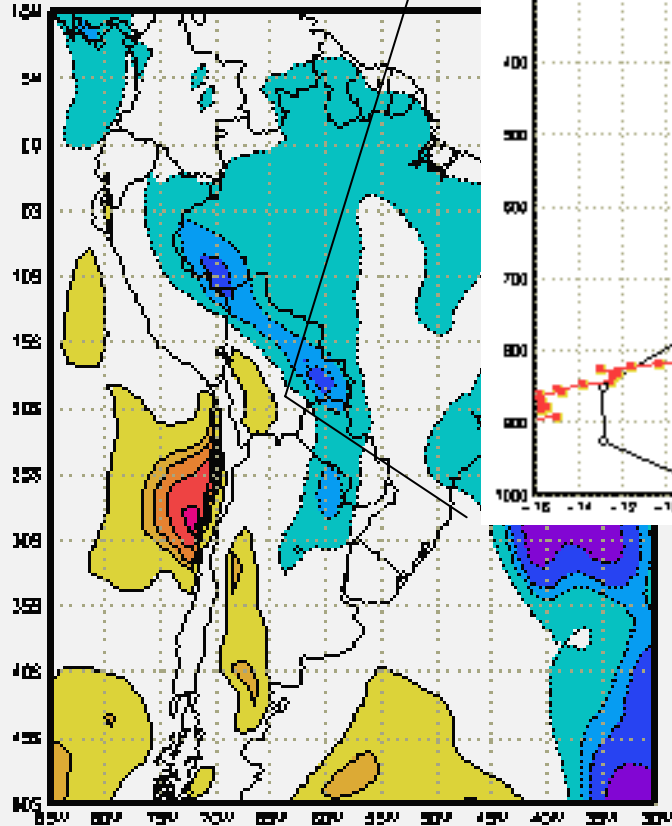


V (m/s) - r (g/Kg) (shaded) - Jan 24 12Z - 925 hPa

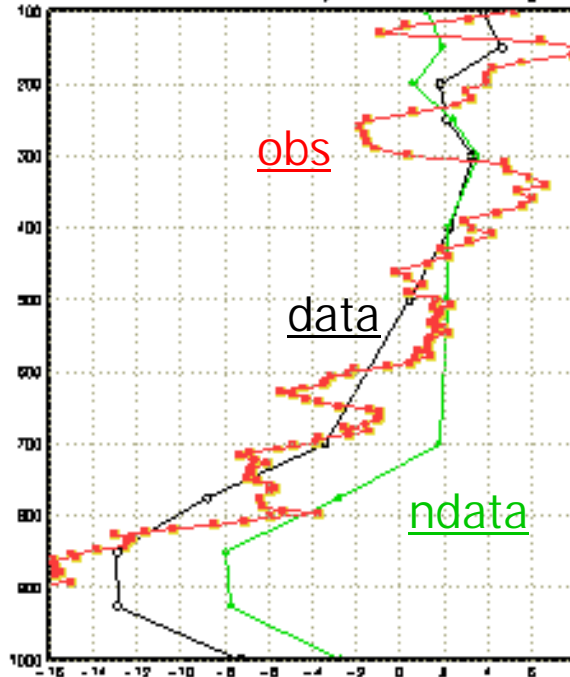


# Meridional Wind -6 h Forecast

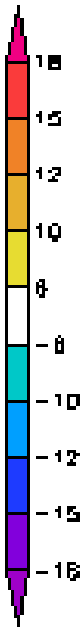
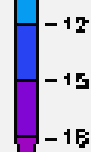
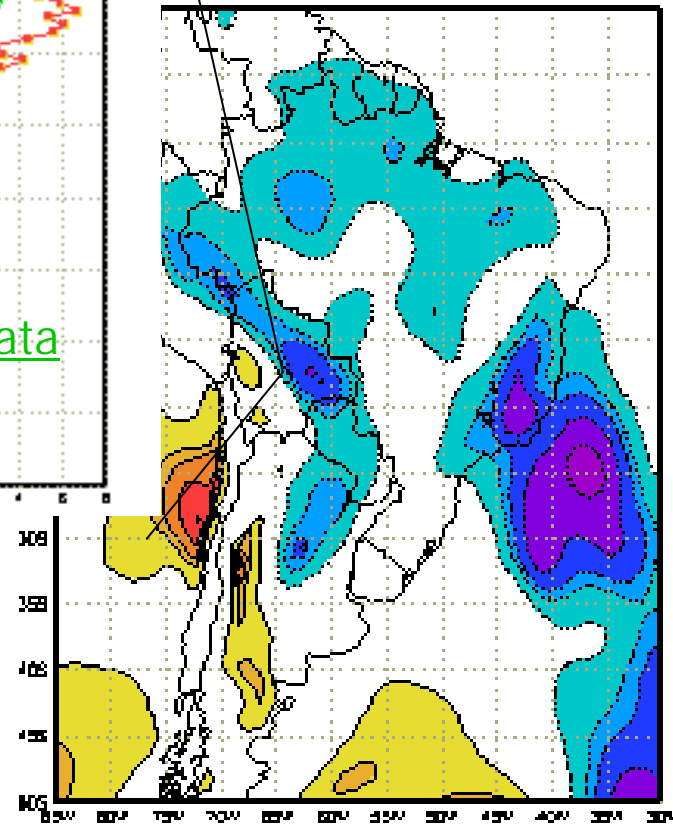
v - T126L28 - Jan 21 06Z



Jan 21 06Z - (17.5S-63.5W)

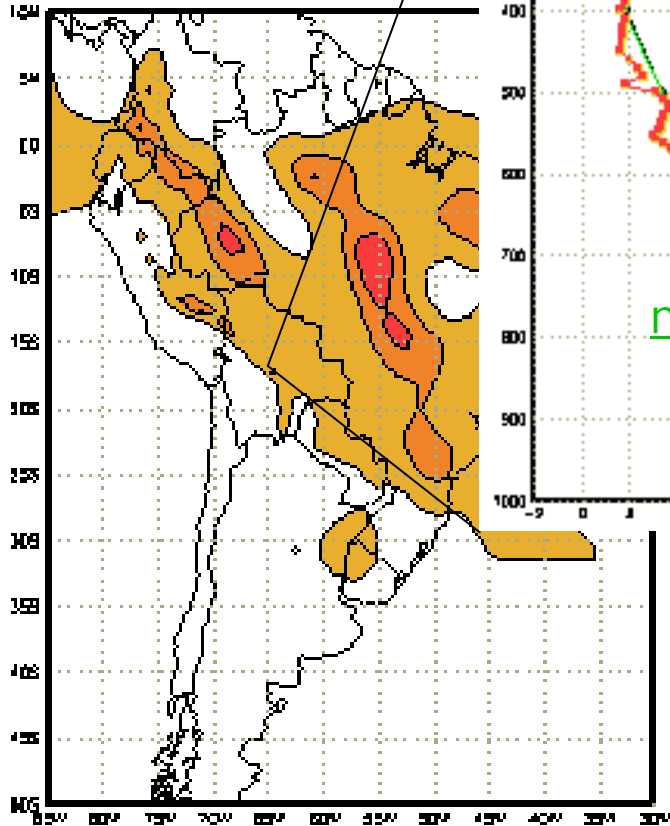


L28 - Jan 21 06Z - SALLJEX

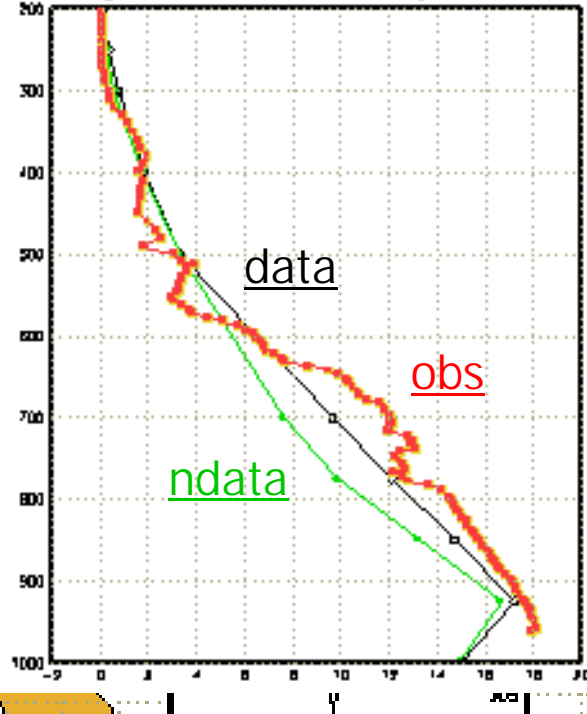


# Humidity - 6 h Forecast

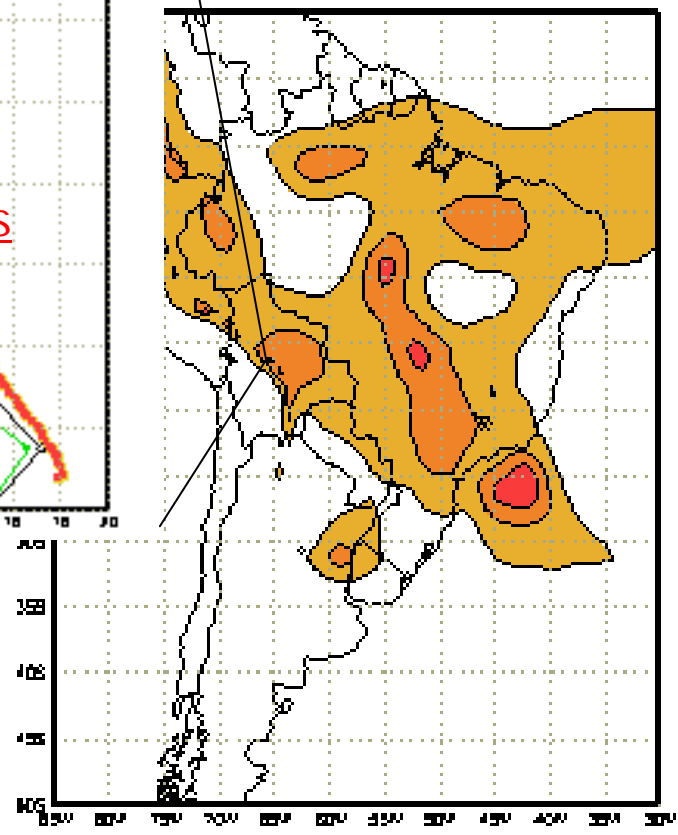
q - T126L28 - Jan 21 06Z



humidity - Jan 21 06Z - (17.5S-63.5W)



L28 - Jan 21 06Z - SALLJEX



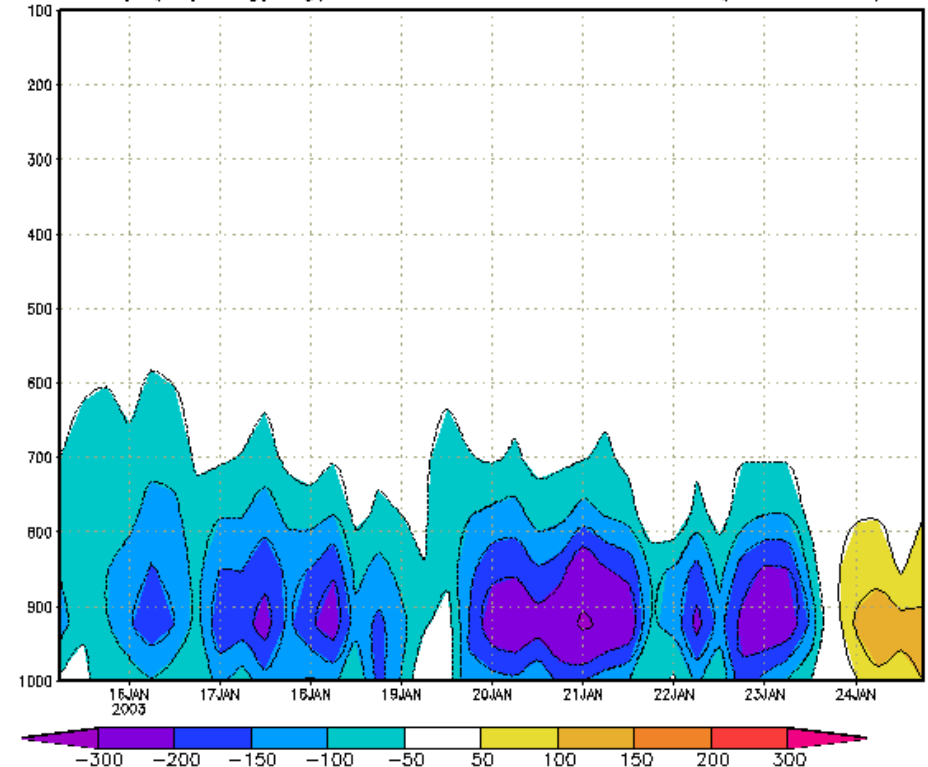
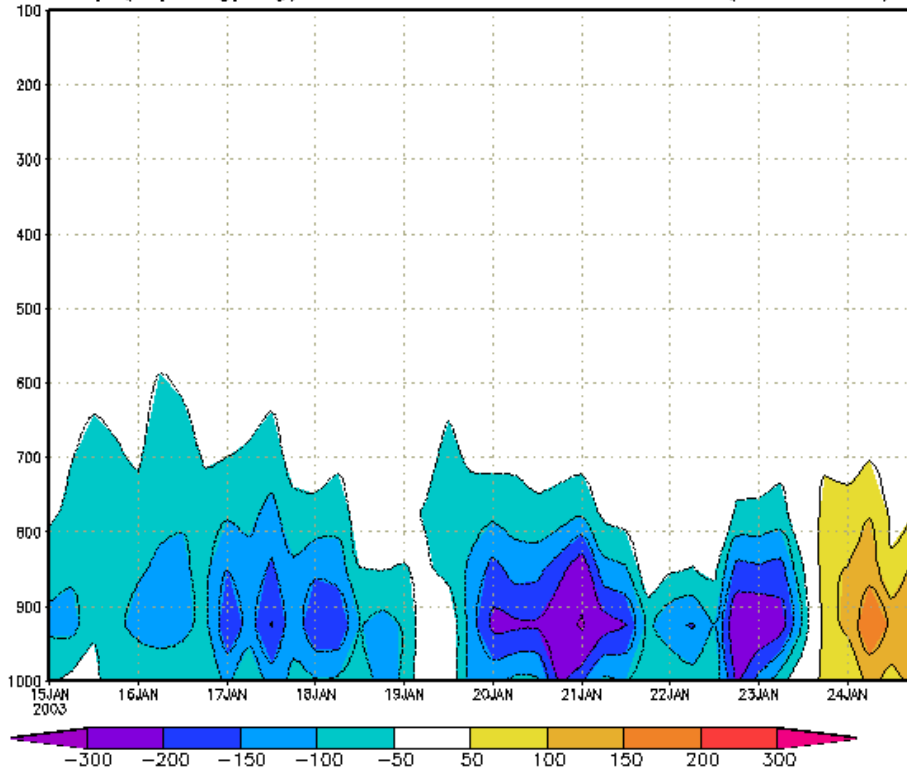
# Meridional Moisture Flux

no SALLJEX data

with SALLJEX data

$vq$  (m/s\*kg/kg) - T126L28 - noSALLJEX (18S-62W)

$vq$  (m/s\*kg/kg) - T126L28 - SALLJEX (18S-62W)

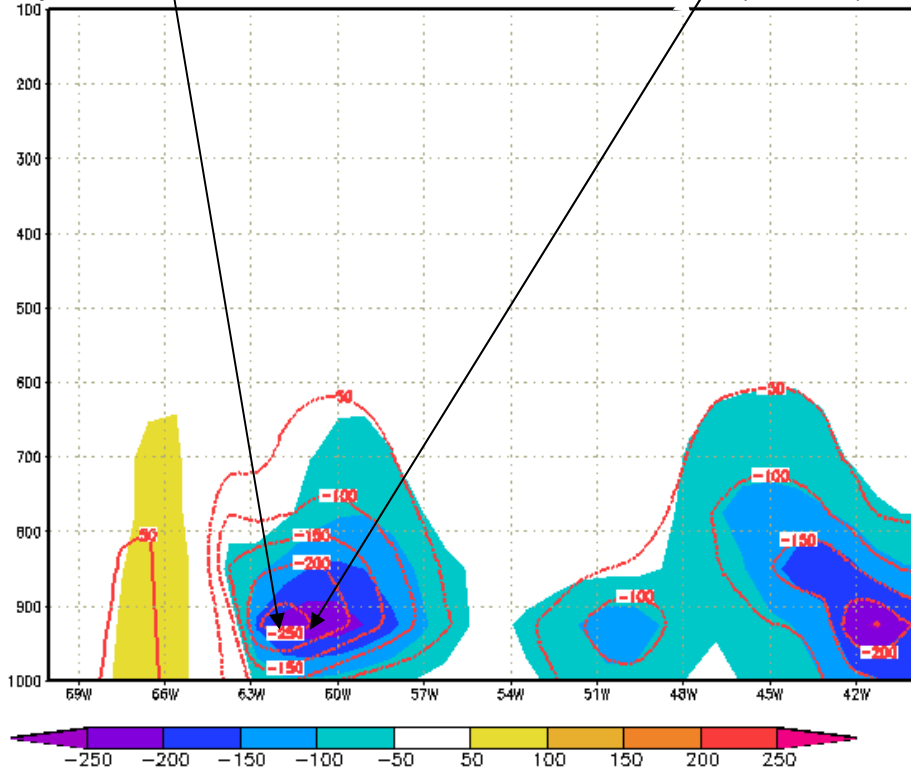


# Meridional Moisture Flux

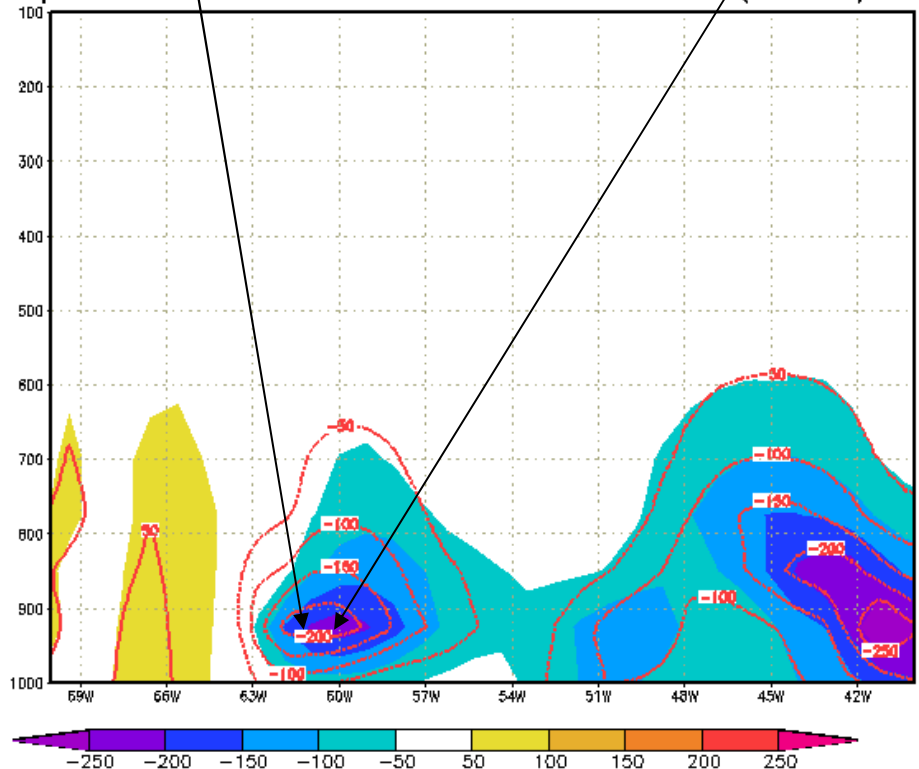
18 S

20 S

vq SALLJEX Reanal. - Jan 21 06Z - control (shaded)-18S



vq SALLJEX Reanal. - Jan 21 06Z - control (shaded)-20S



# Next Steps..

- PREPARE THE ANALYSIS ASSIMILATING THE COMPLETE SALLJEX DATASET
- EXPERIMENTS ADDING DATA FROM EACH STATION TO VERIFY WHAT IS THE IMPACT
- PREPARE A REANALYSIS DATASET OF THE SALLJEX PERIOD
- EXPLORE THE IMPACT OF REMOTE SENSING DATA SPECIFICALLY PRODUCED IN THE SALLJEX REGION
- ASSIMILATION USING REGIONAL ETA MODEL