UNALM

FOG IN THE CITY OF AREQUIPA – PERU
Case: February 10, 2015

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INTRODUCTION

- Reducing the horizontal visibility at the occurrence of fog affects many activities , being the most outstanding in transport.
- The Arequipa airport is sensitive to fog events during the rainy season (jan – mar), and sometimes during unexpected times of the diurnal cycle.
- **Objective:** identify the synoptic conditions that lead to the occurrence of fog on February 10, 2015 in the city of Arequipa

Geographic Location

Lat: 16.32º S
Lon: 71.55º W
Alt: 2325 msnm


Pallca
Chachani
Pampa de
Arrieros
Misti
Yura Viejo
Yura
Aeropuerto
Yanahuara
Arequipa
Paucarpata
Uchumayo
Sabandía
Socabaya
Characato
Mollebaya

Background

TEMAS DEL DÍA

Todo Sur

Martes, 10 de febrero de 2015 | 10:00 am

Otra vez vuelos afectados por neblina

Me gusta Compartir 0 Twittear 0 +1 0

09 de Febrero del 2015

Neblina causa perjuicios en aeropuerto y carreteras

TVT Arequipa compartió la publicación de Municipalidad Distrital de Yura.

10 de febrero ·

ALERTAN SOBRE DENSA NEBLINA EN VÍA DE SALIDA HACIA PUNO.
Fuente: Municipalidad de Yura.

CLIMATOLOGY

- Highest cases : January , February and March
- Local term : “Camanchaca”

Materials and tools

- GFS data 09 , 10 and February 11, 2015
- CPTEC Satellite images
- Wingridds
- Metar data

Analyzed variables

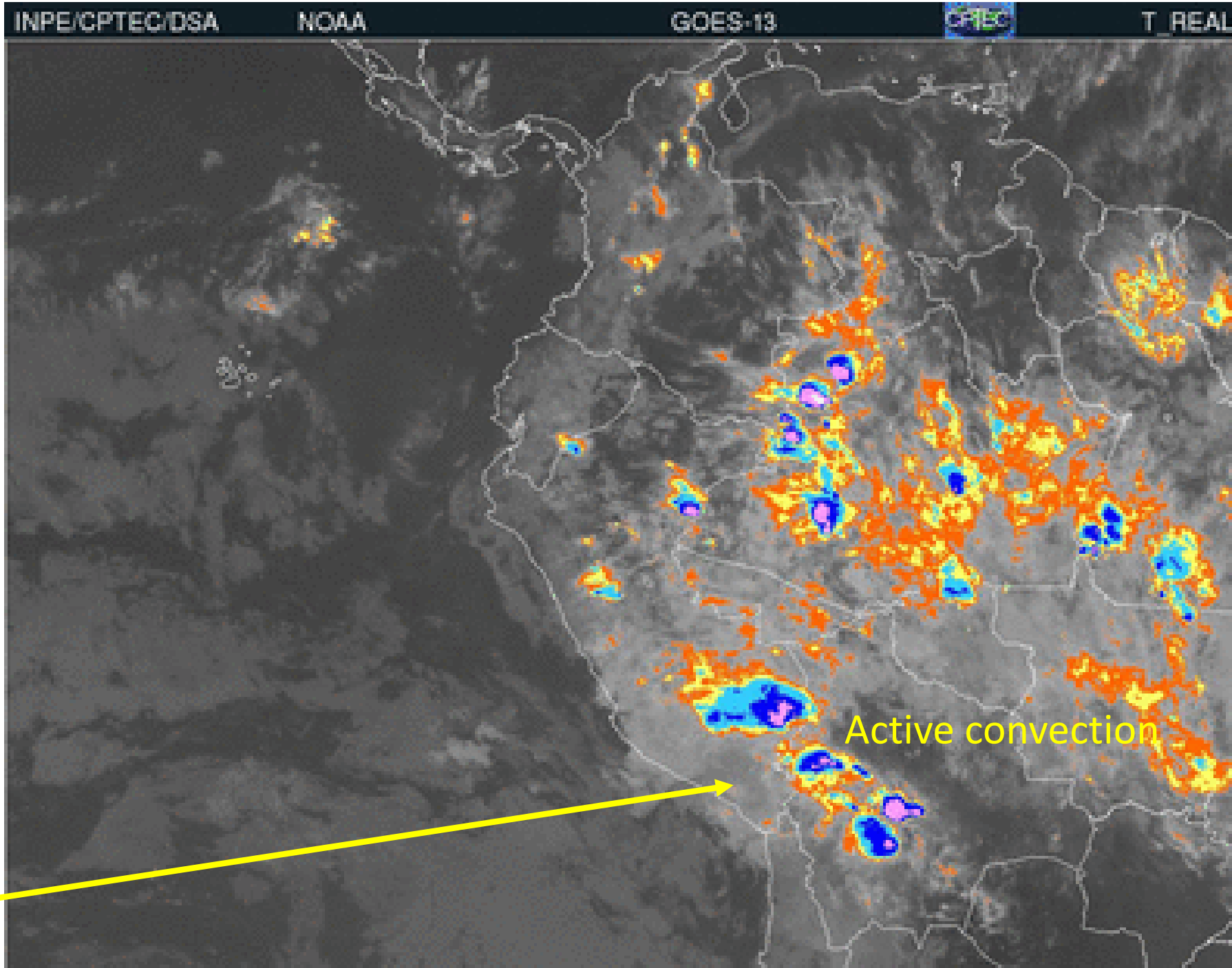
- Humidity: Mixing ratio , precipitable water and relative humidity
- Temperature : Temperature Potential
- Wind: Flow in low and high levels , means
- Convergence and Divergence
- Stability : GDI

Limitations

- Model resolution
- Orography

RESULTS

IR4 09 and February 10, 2015



Metar – February 2015

201502100600 METAR SPQU 100600Z 27003KT 6000 SCT002 BKN003 10/10 Q1026 RMK PP000=
201502100700 METAR SPQU 100700Z 23003KT 1000 R10/0750VP1500D FG OVC002 10/10 Q1026 RMK PP000=
201502100800 METAR SPQU 100800Z 23003KT 0800 R10/0750V1000N -RAFG OVC002 10/10 Q1026 RMK PP008=
201502100900 METAR SPQU 100900Z VRB03KT 0800 R10/0800N -RAFG OVC002 10/10 Q1025 RMK PP006=
201502101000 METAR SPQU 101000Z 23003KT 0500 R10/0500VP1500U -RAFG OVC002 10/10 Q1025 RMK PP005=
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201502101600 METAR SPQU 101600Z 26004KT 220V300 7000 OVC004 12/11 Q1027 BECMG OVC008 RMK PP000=
201502101615 SPECI SPQU 101615Z 26007KT 0700 R10/0550VP1500D FG OVC001 11/11 Q1027=
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201502101720 METAR SPQU 101720Z 25006KT 210V280 5000 SCT002 SCT004 12/11 Q1026=
201502101733 SPECI SPQU 101733Z 26007KT 0250 R10/0275N FG OVC001 11/11 Q1026=
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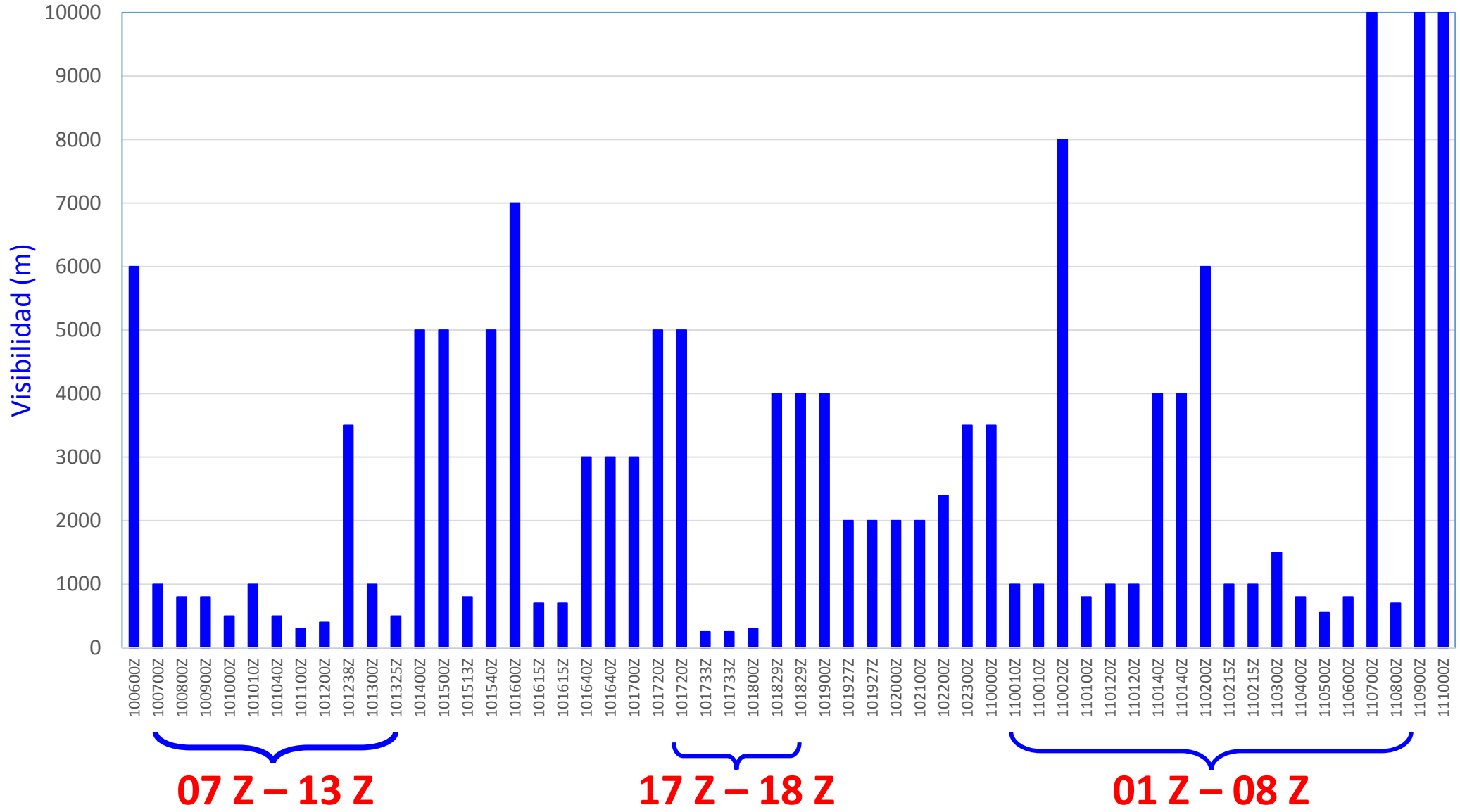
201502101829 METAR SPQU 101829Z 27007KT 4000 OVC002 11/11 Q1026 TEMPO 1000 BCFG OVC002=

- RAFG

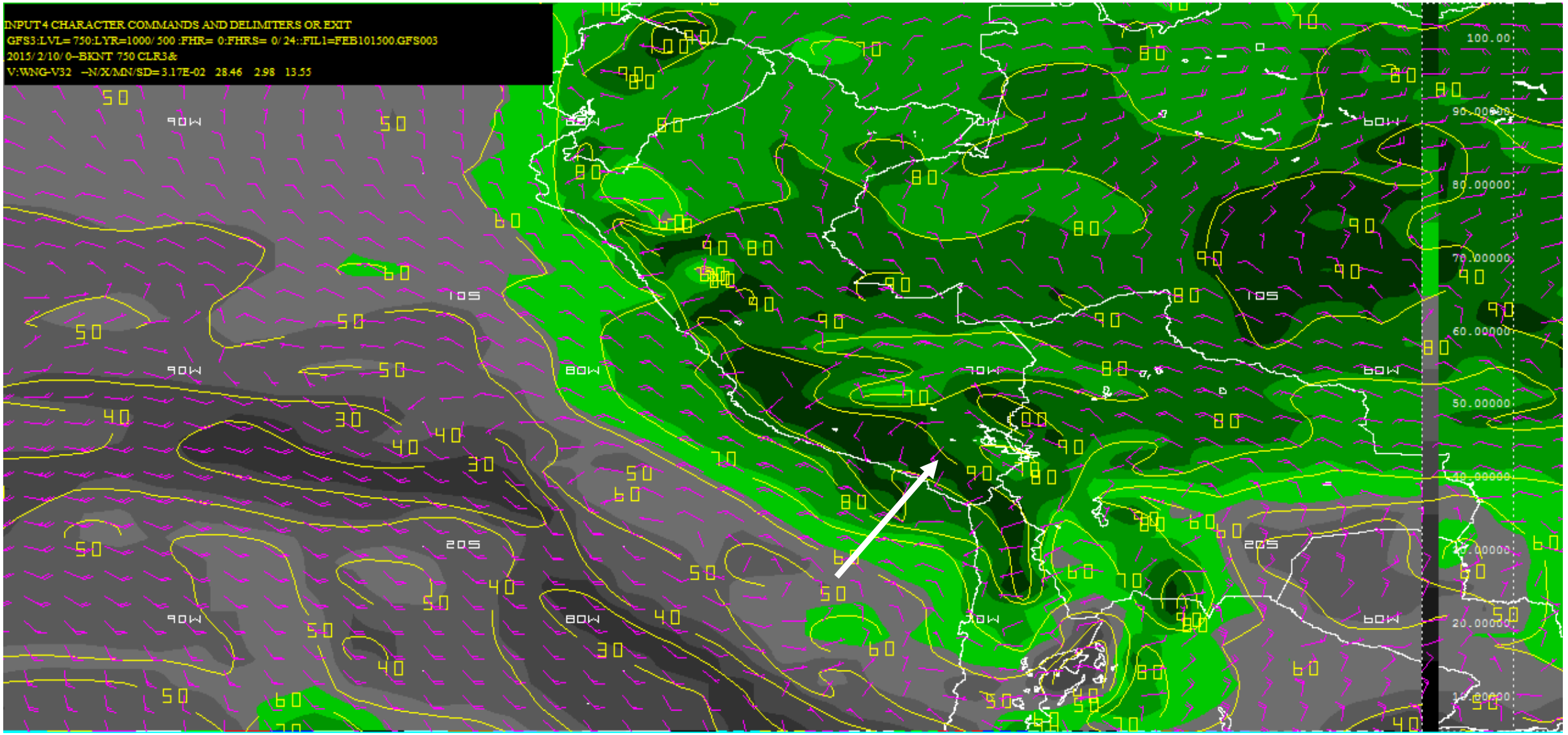
FG

FG

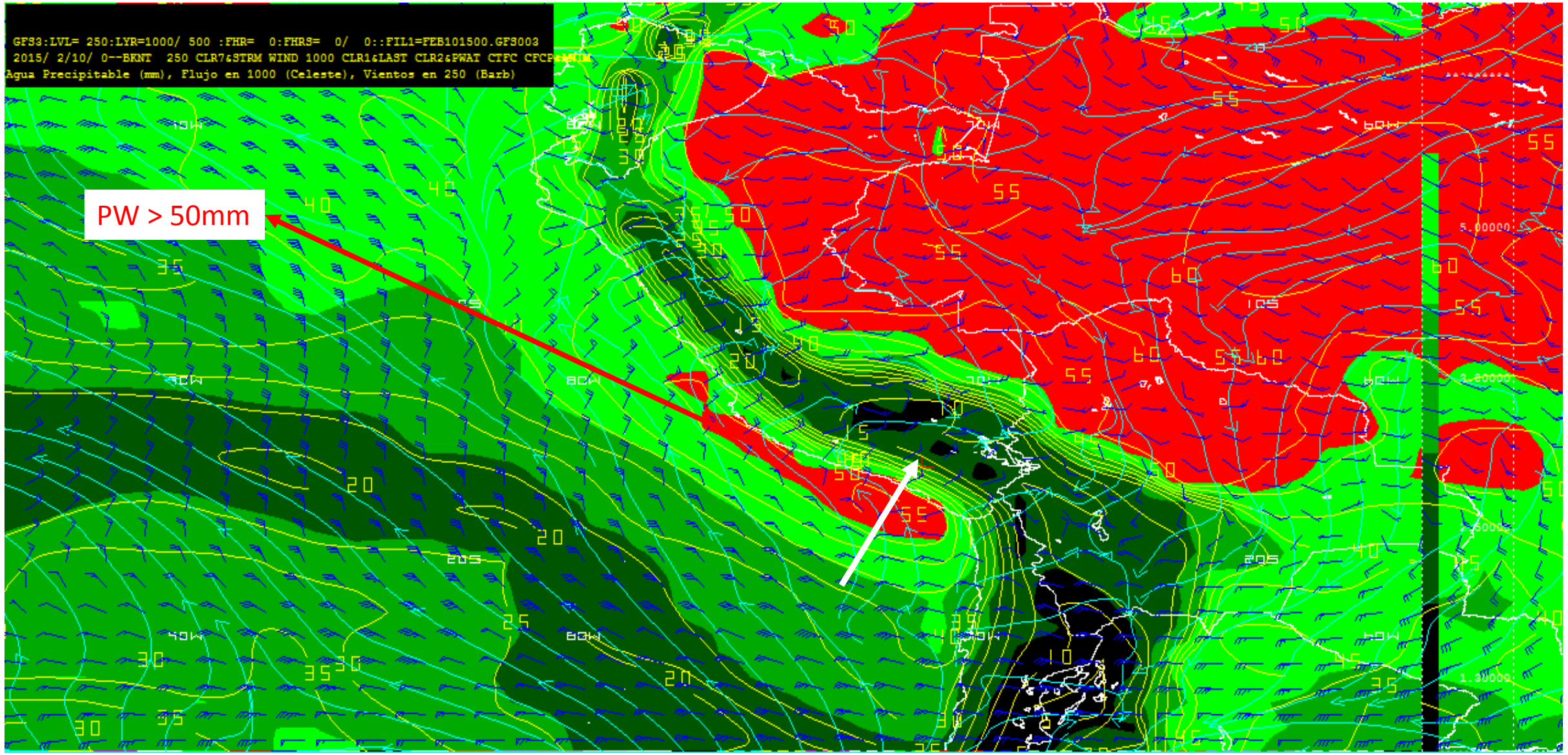
HORIZONTAL VISIBILITY - AREQUIPA AIRPORT (SPQU)
10 and 11 FEBRUARY 2015



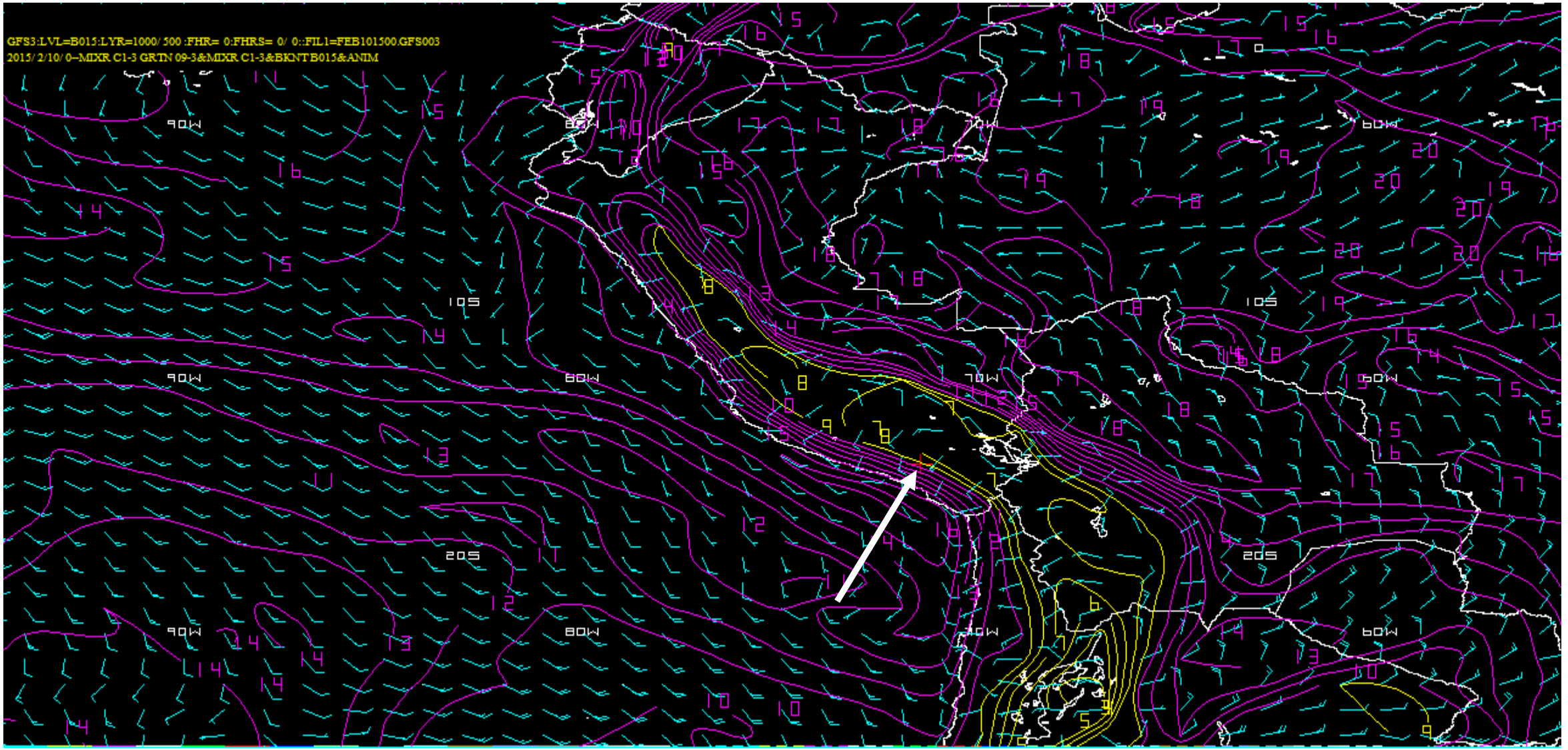
Relative humidity (%) Wind (kt) at 750 hPa



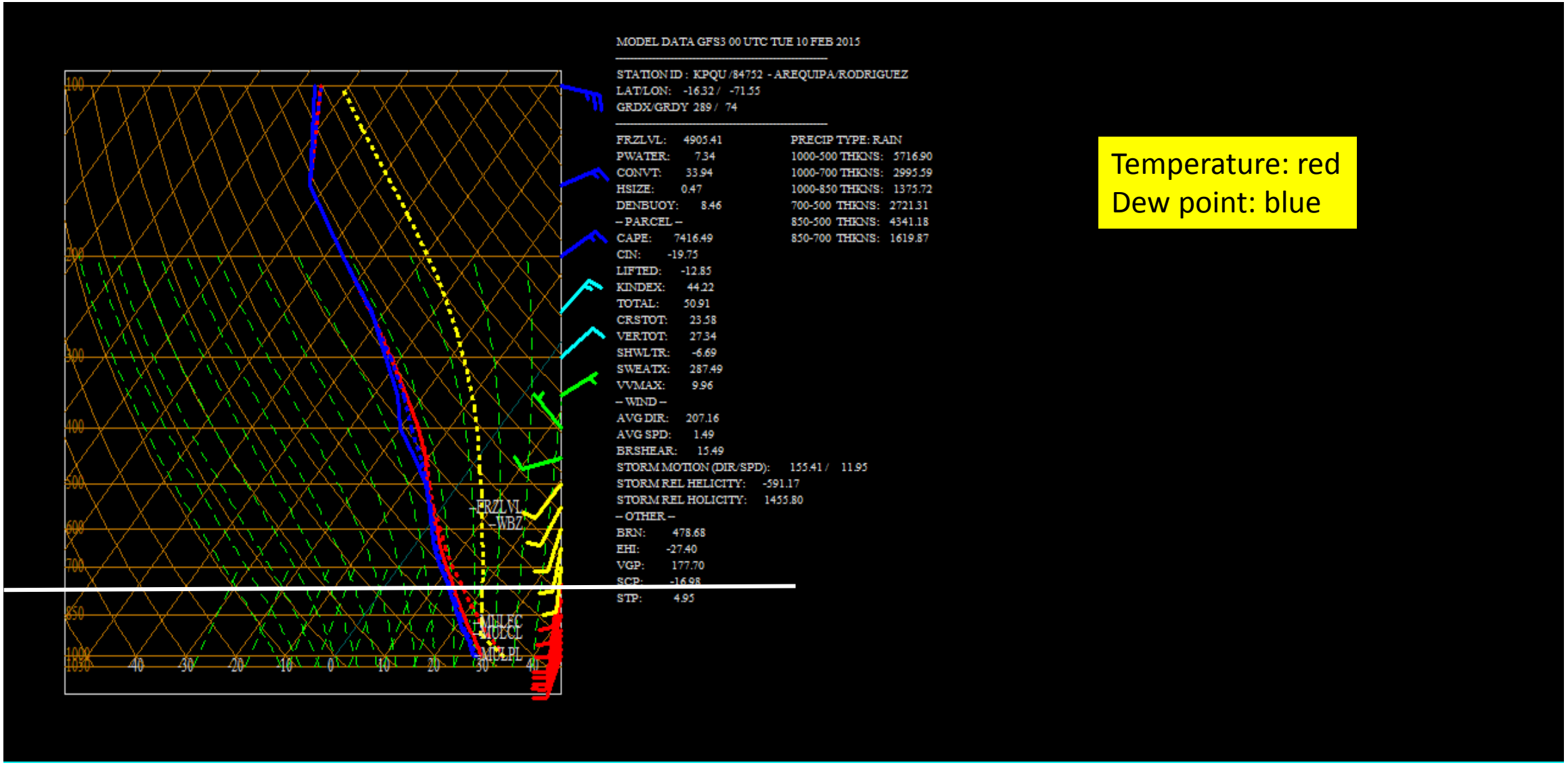
Precipitable water(mm), flow at 1000 hPa and wind at 250 hPa



Mixing ratio (g / kg) and wind (kt) in the boundary layer

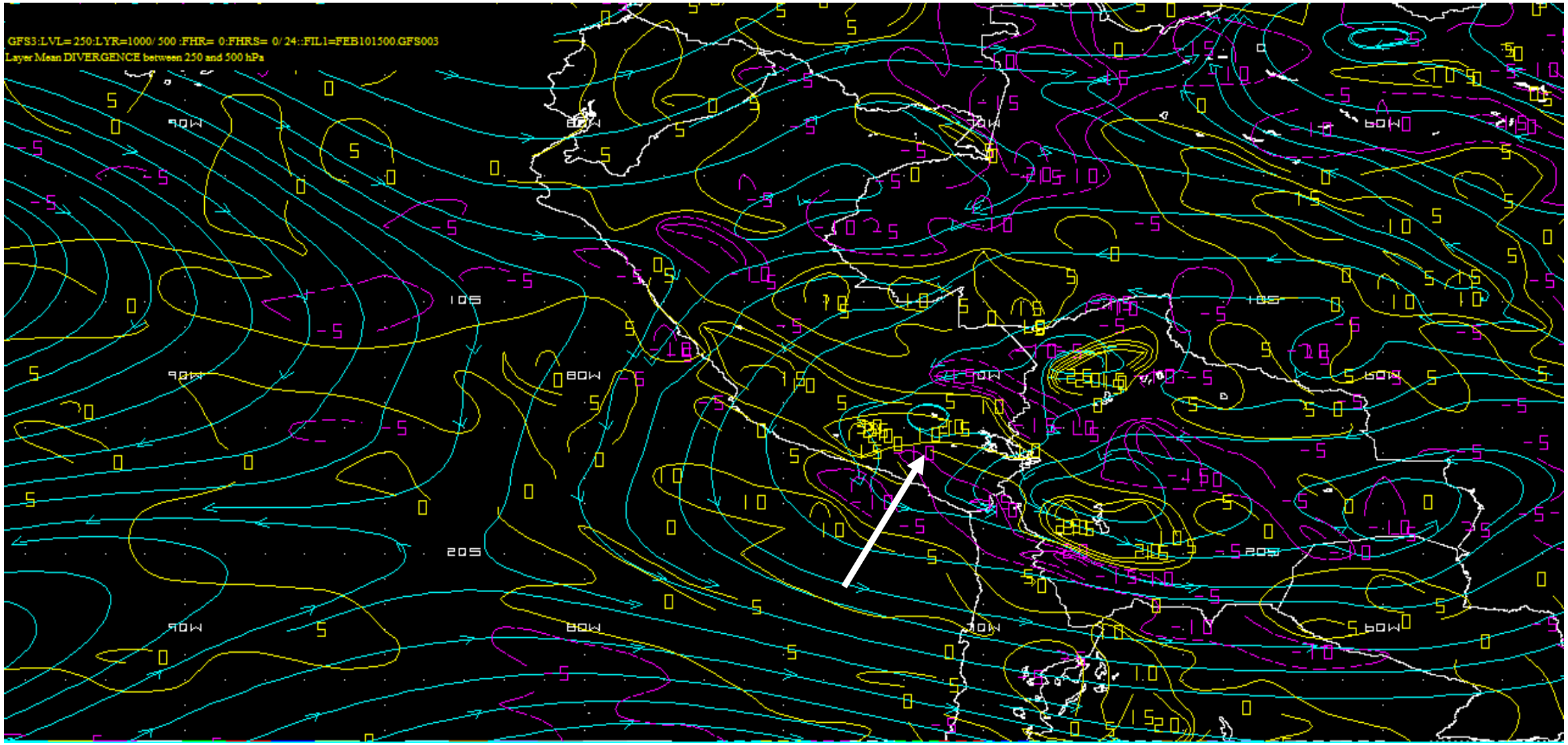


Sounding GFS

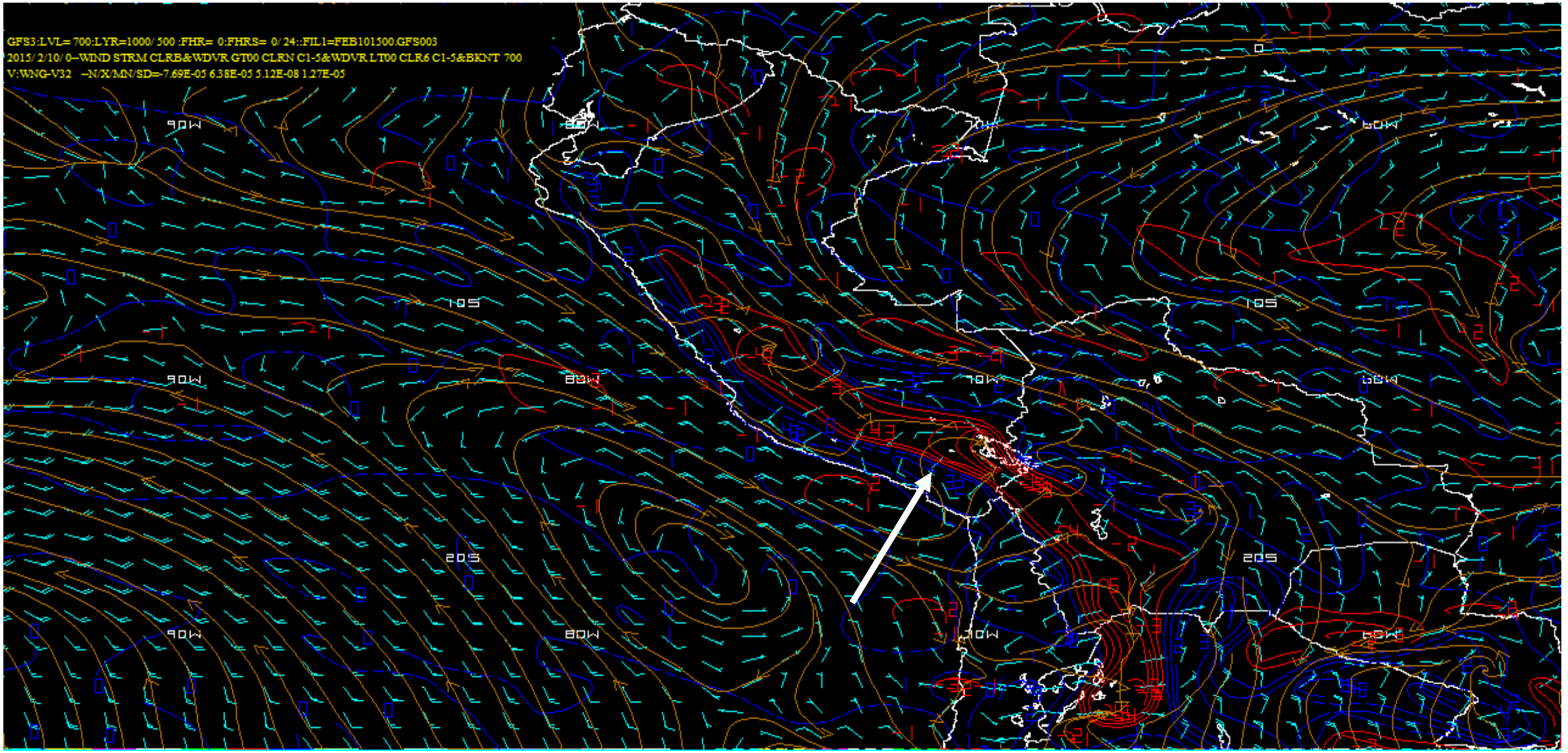


Temperature: red
Dew point: blue

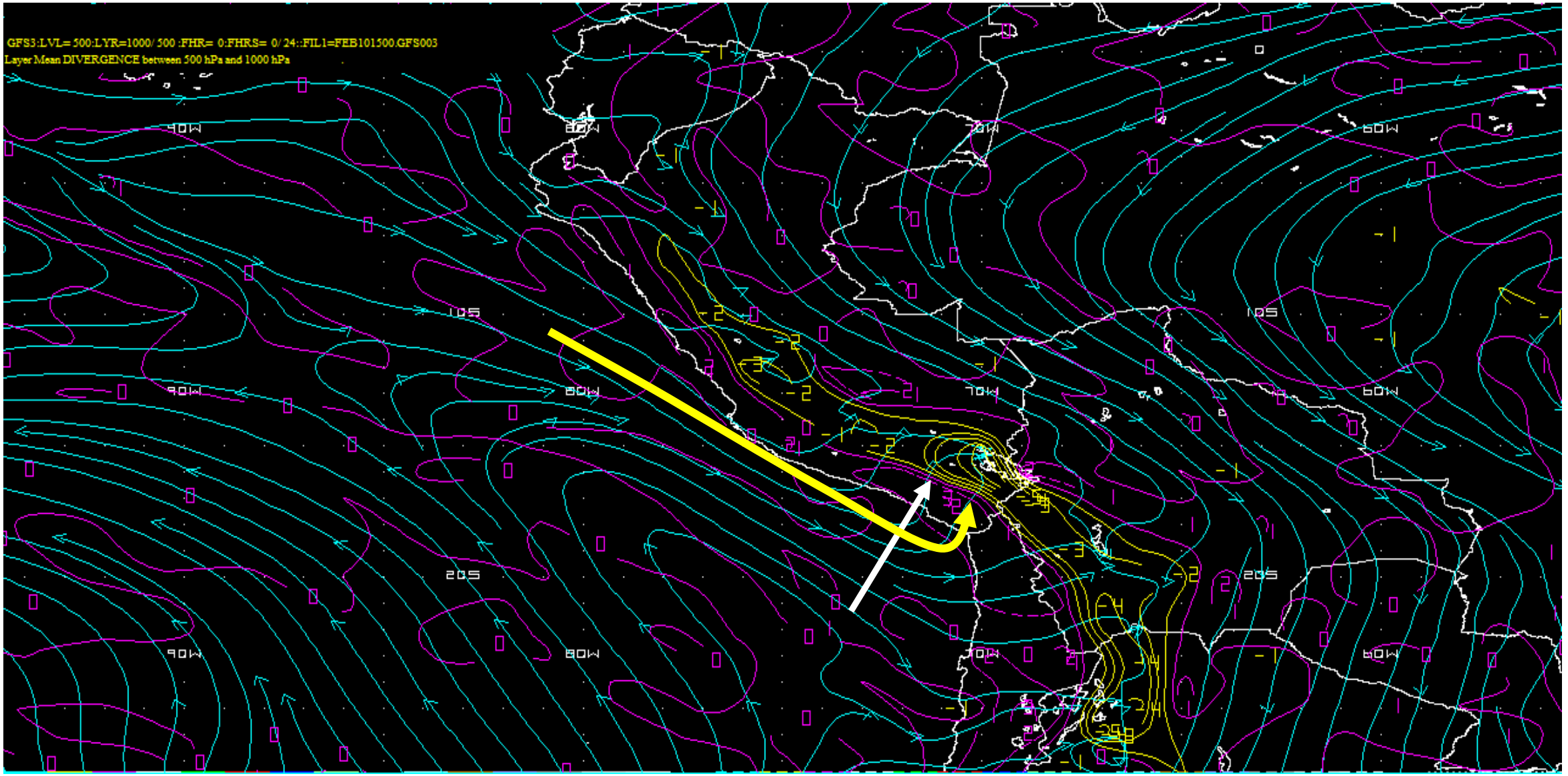
Convergence (magenta) y Divergence(yellow) (x10^5 s-1)
layer 500-250 hPa



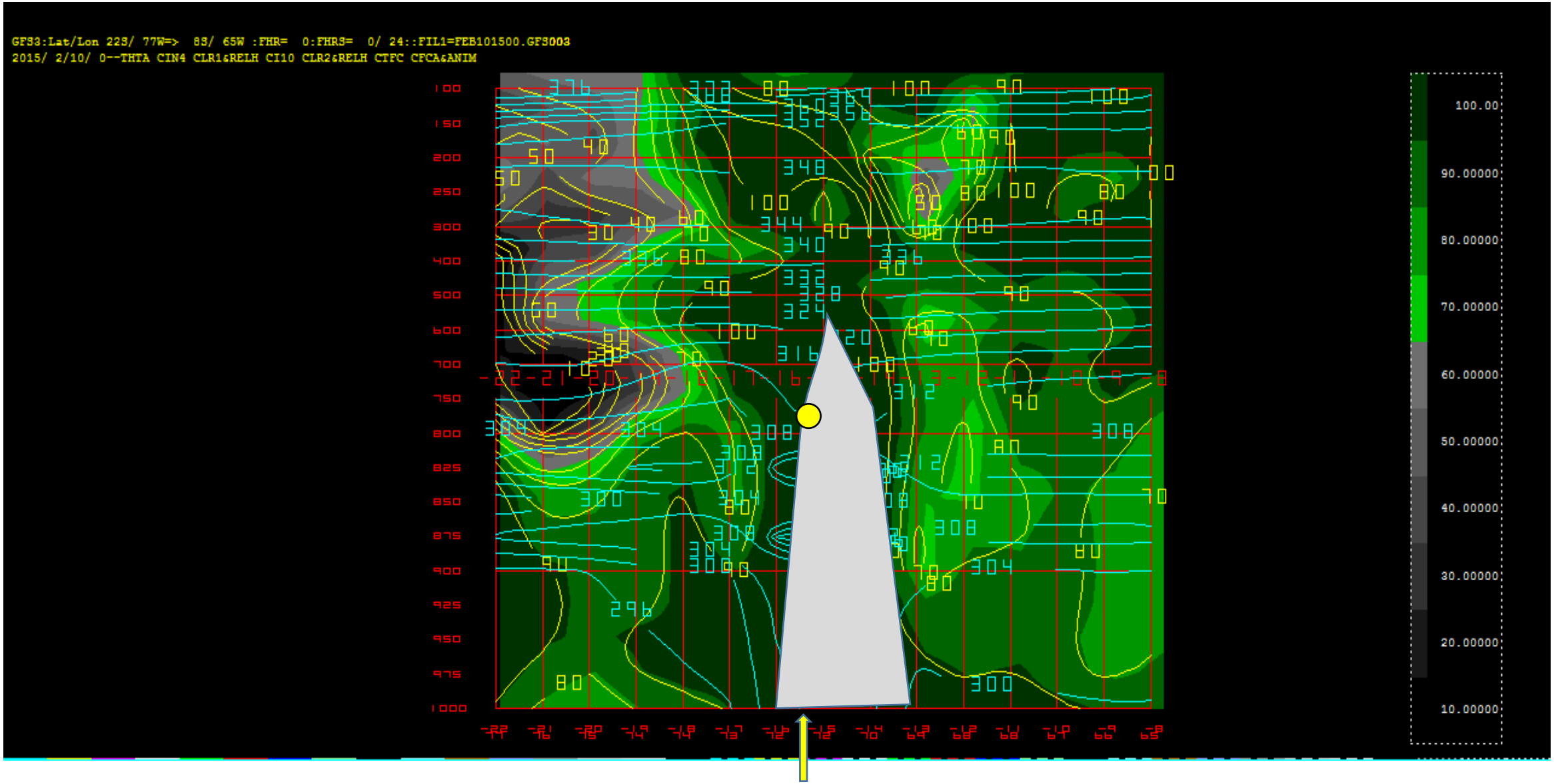
Convergence (red) y Divergence(blue) (x10^5 s-1) at 700 hPa



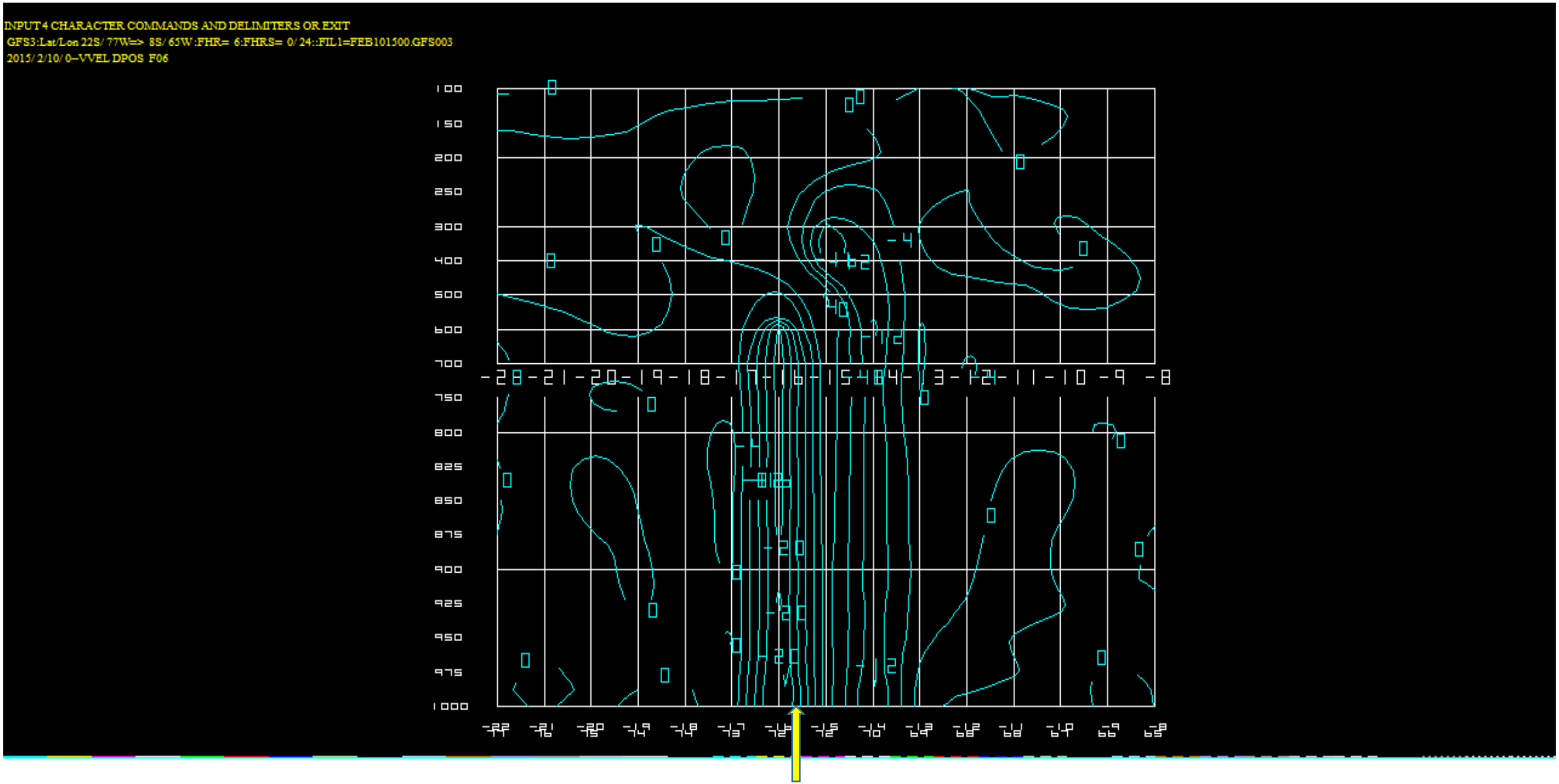
Convergence (yellow) y Divergence (magenta) (x10^5 s-1)
layer 1000 – 500 hPa



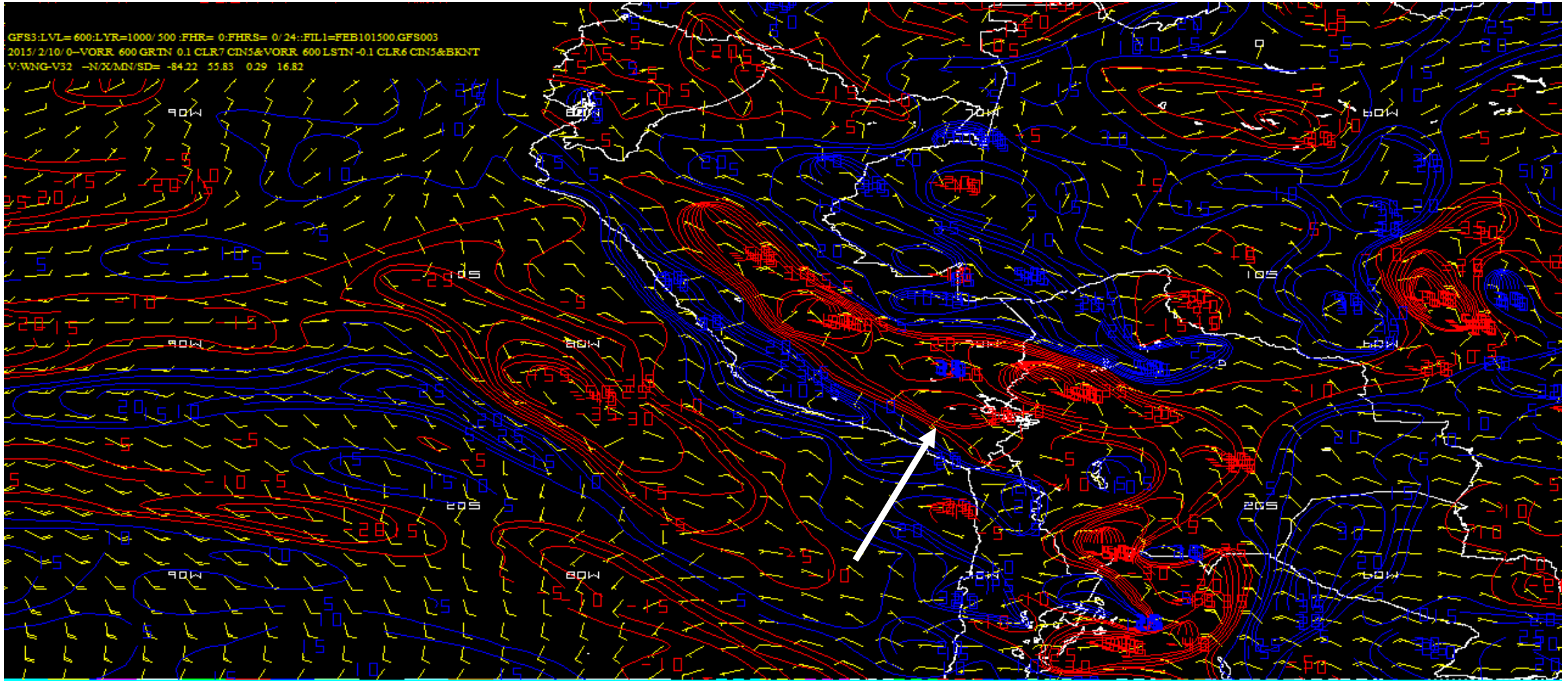
Potencial Temperatura (K) and relative humidity(%)



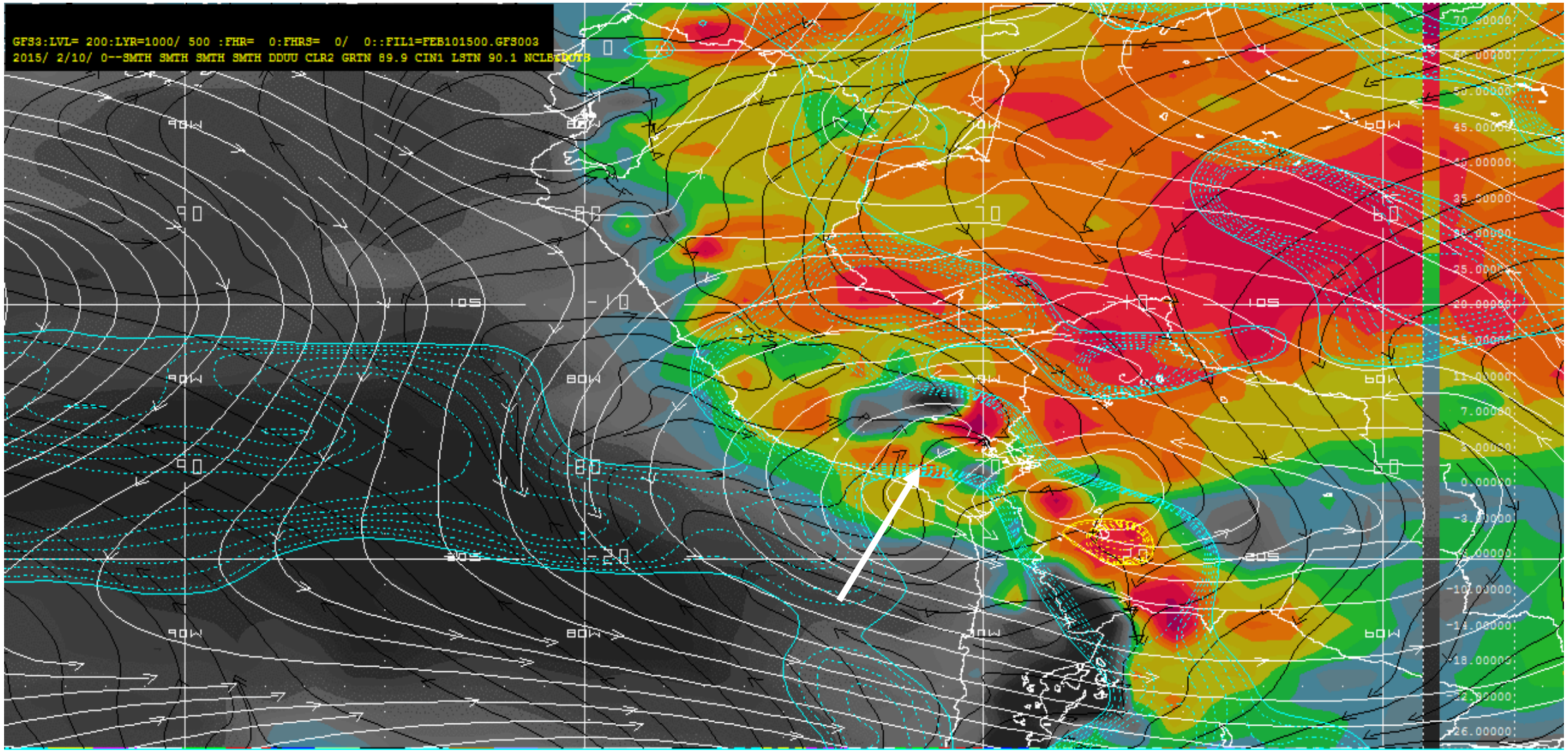
Vertical speed (hPa/s)



Vorticity (x10^6 s-1) y wind at 600 hPa



Index GDI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2015/ 2/10/ 0--SMTH SMTH SMTH SMTH DDUU CLR2 GRTN 89.9 CIN1 LSTN 90.1 NCLB1DOT3

CONCLUSIONS

Factors identified for the occurrence of fog

- Nearly saturated layer
- The coastal trof , causing southerly (onshore) flow west to the highlands of Arequipa
- Subsidence in the layer of 600-400 hPa
- Divergence in 700 hPa and average divergence between 1000-500 hPa (indirect assessment of stratification)
- Topography (airport in small valley)

Muchas Gracias!

Thank you!