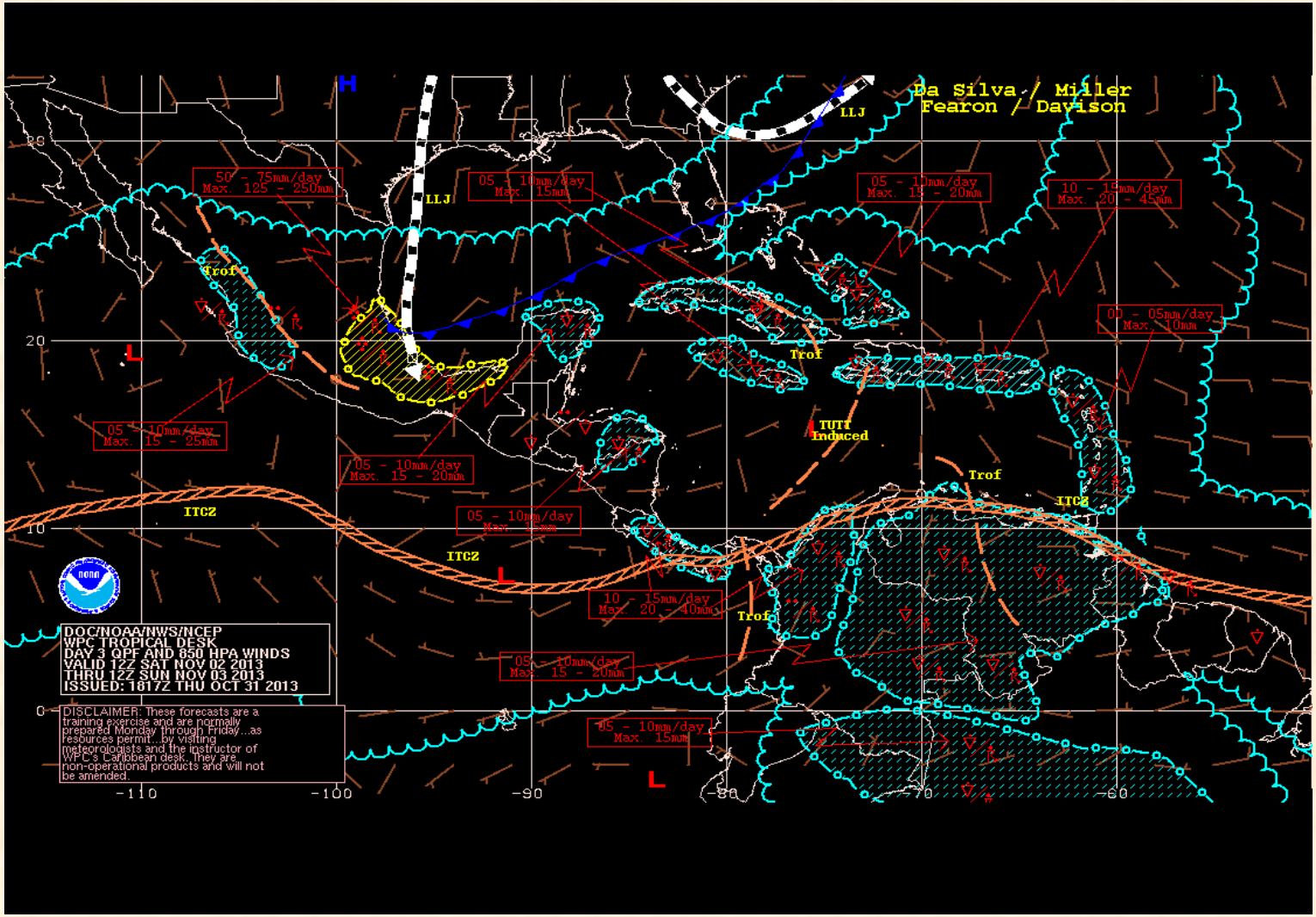
Summary of Activities in the Tropical Desk and Presentation of a Case Study

Presented by:
Silvia Regina Santos da Silva
NOV/2013

Outline:

- Activities performed during the training.
- Case Study: Tropical Upper Tropospheric Trough (TUTT) Low/Tropical Wave Interaction.

Tropical Desk Final Product:



How do we reach to this chart?

Tropical Desk Tools

- Flow Analysis: 250 hPa, 500 hPa and 850 hPa.
- Satellite Interpretation (Gempak).
- Model Analysis: GFS, ECMWF, UKMET (Gempak).
- Analysis with Wingridds(GFS).

Other considerations…

- MJO (source: CPC/NOAA).
- Topography.

Case Study: Oct31 – Nov02, 2013

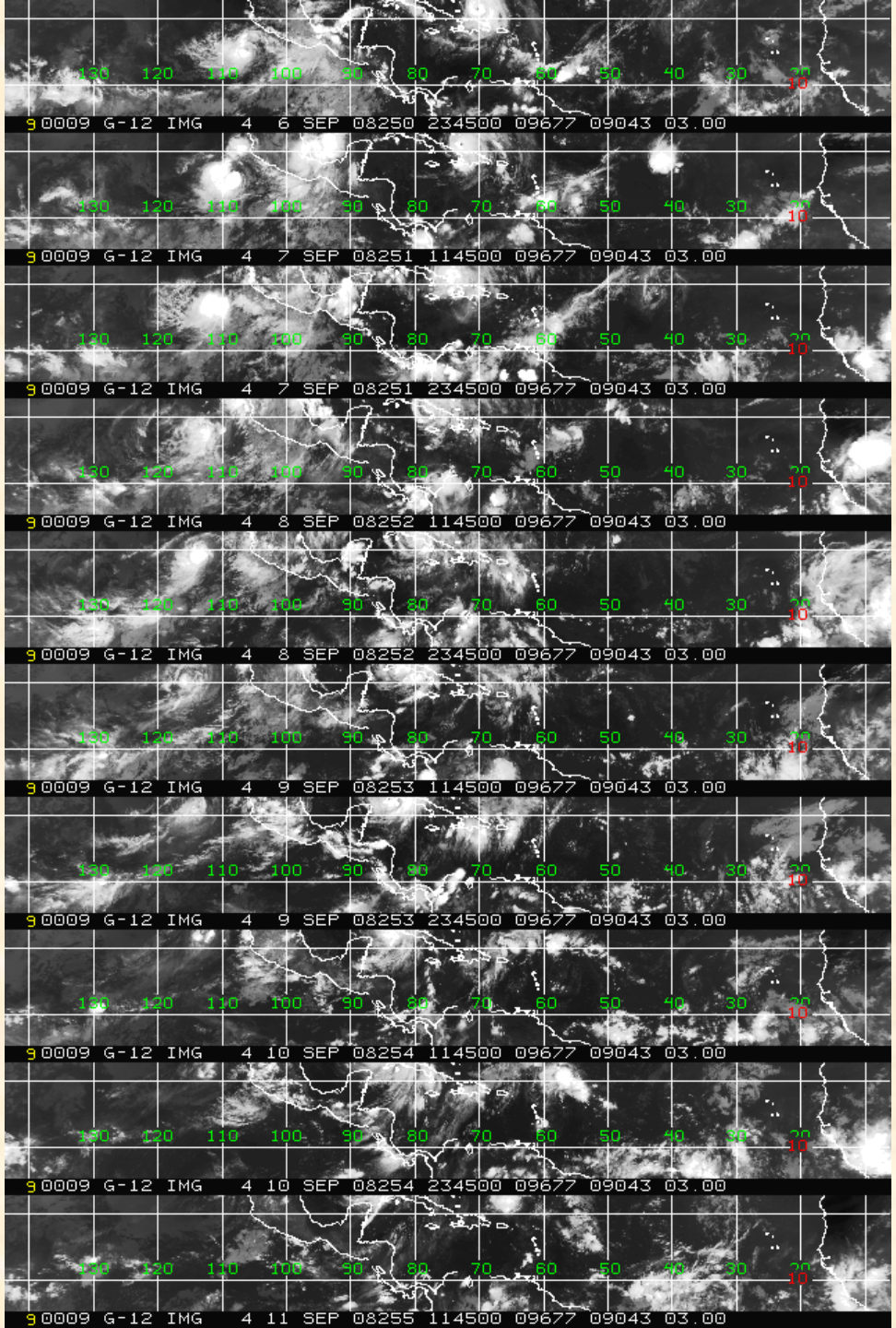
Interaction TUTT Low / Tropical Wave

How do we analyze TW, EW and TUTT induced perturbations?

Step 1 - Identifying the perturbations in Satellite Images (low level clouds).

Step 2 - Verifying the origin of the perturbation.

Hovmöller Diagram



Hovmöller Diagram

http://www.nhc.noaa.gov/analysis_tools.shtml

Did the wave originate from Africa?

Yes - TW
No - EW

Step 3 – Model Analysis/Comparison

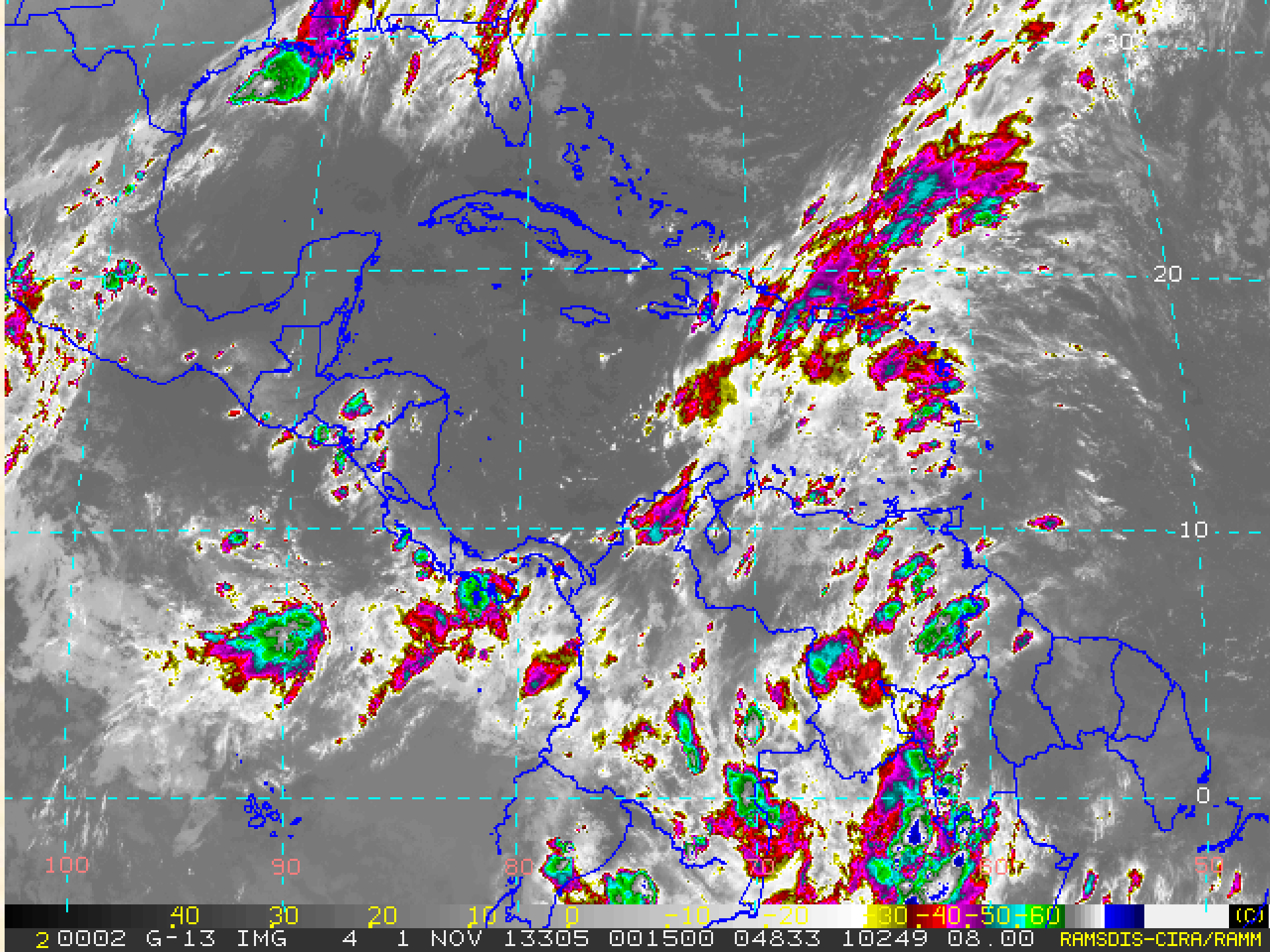
	Wave #	Long: 69		South of Lat: 18		Type: TW
Initialization at 12Z				Speed:		
	GFS			EC		
Forecast	700 Hpa	850 Hpa	Effects	700 Hpa	850 Hpa	Effects
24 hrs	71	71		72	72	72
36 hrs	75	75		75	75	75
48 hrs	78	78		78	79	78
60 hrs	81	81		81	81	81
72 hrs	84	84		85	84	84
84 hrs	86	87		88	86	87
Comment	91	90		91	89	90

- Tracked by looking at the 850 and 700 hPa levels for kinks in the winds or anti-clockwise turning/ciclonic vorticity.

TUTT Induced perturbations

- An inverted trough in the low level easterlies moving in phase with an upper TUTT/TUTT Low: Probably an induced trough not a tropical wave.

- Tools:
  - Water Vapor satellite imagery.
  - IR and Visible Imagery.
  - Streamline/Wind Analysis at 250-200 hPa.


30
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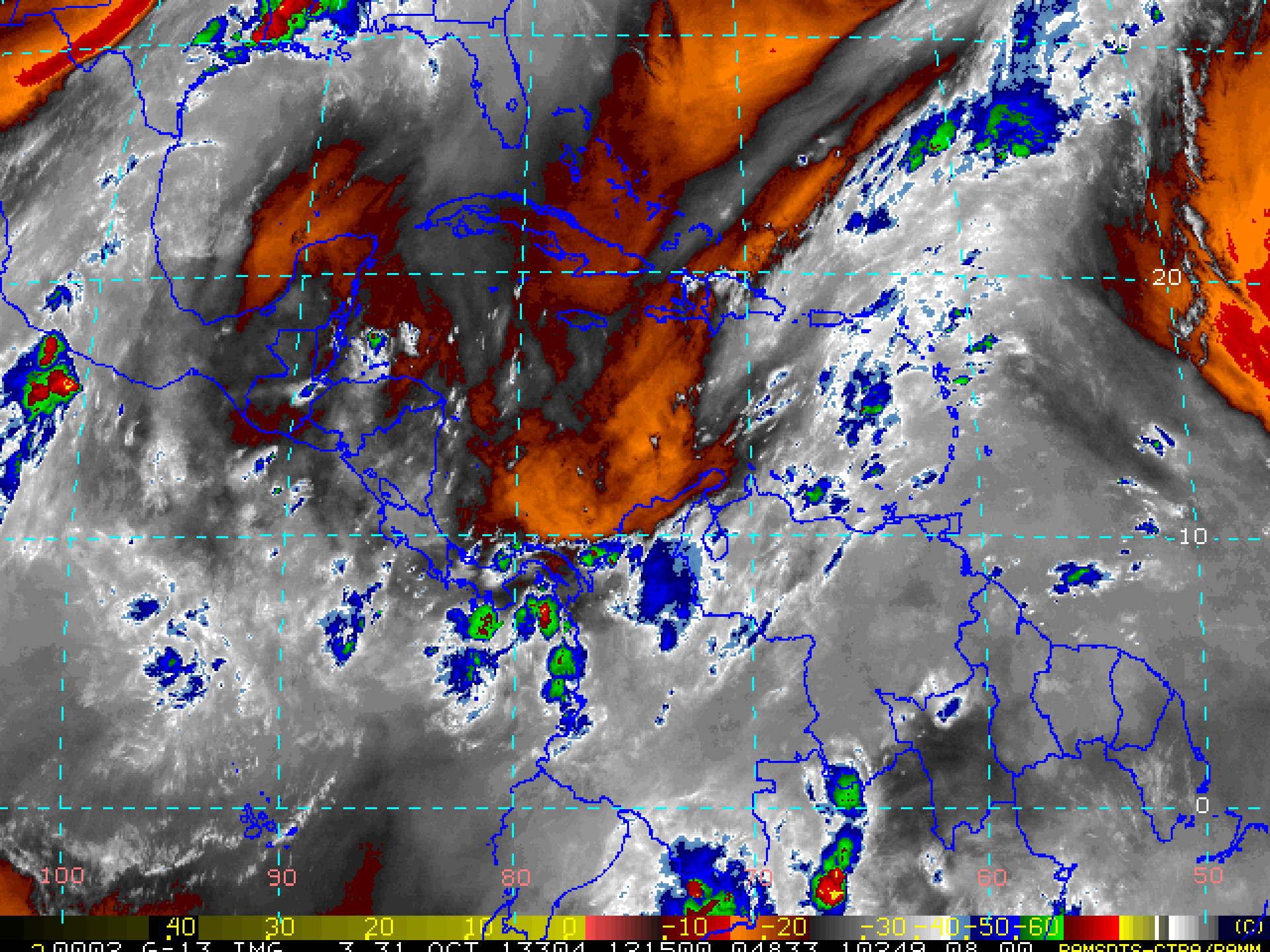
(C)
2 0002 G-13 IMG 4 1 NOV 13305 001500 04833 10249 08.00 RAMSDIS-CIRA/RAMM


20
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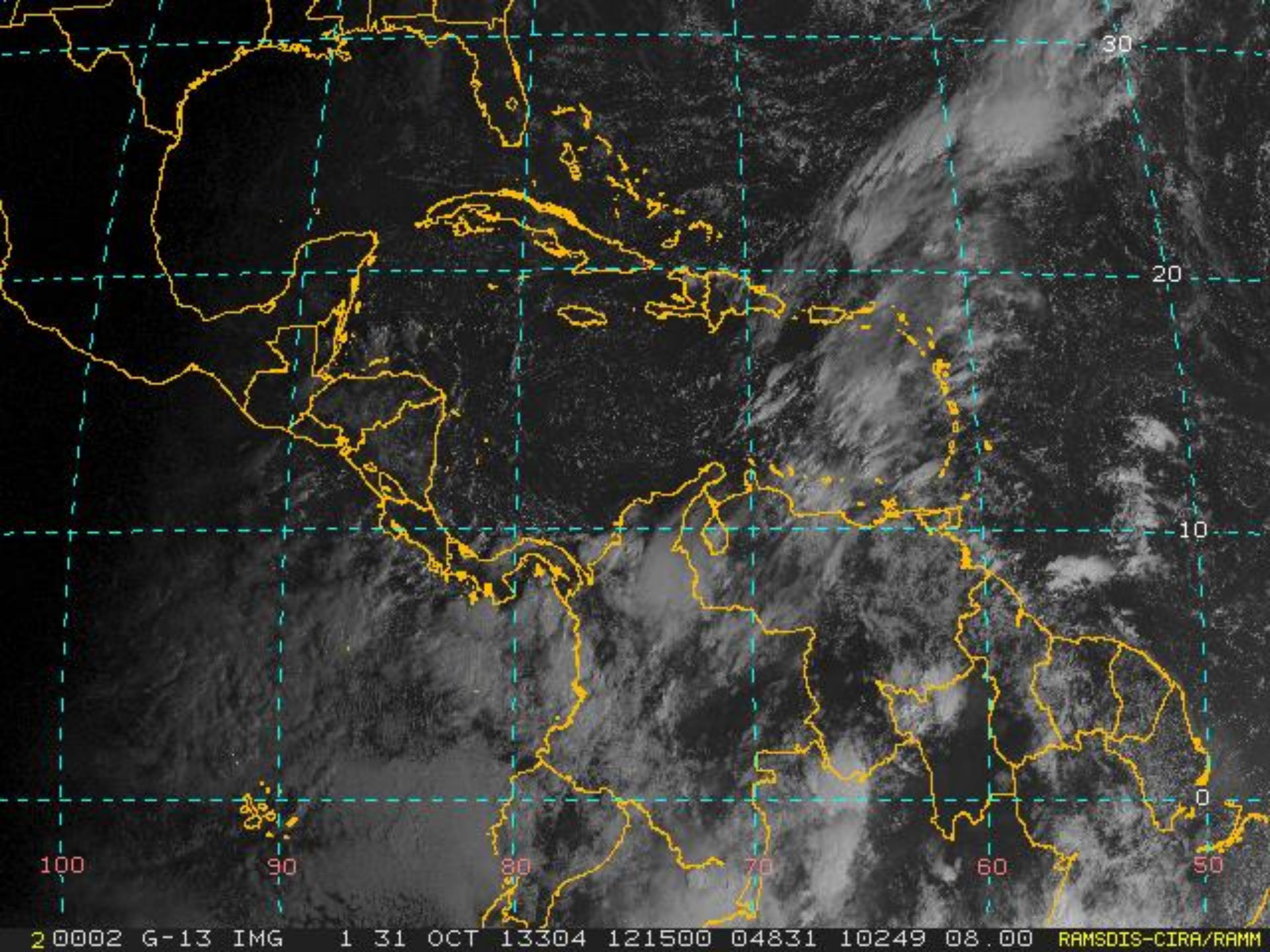
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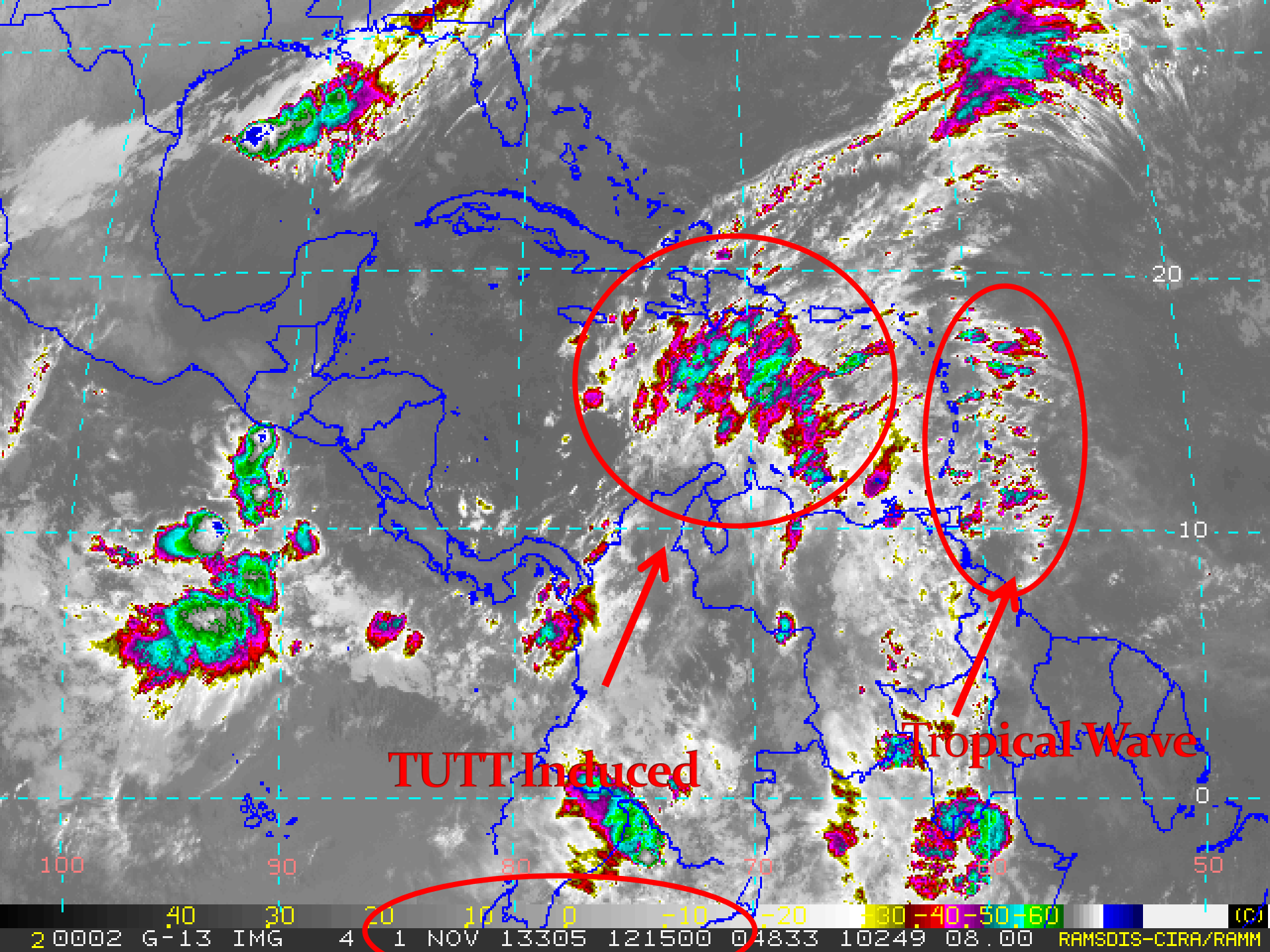
TUTT Induced
Tropical Wave
20
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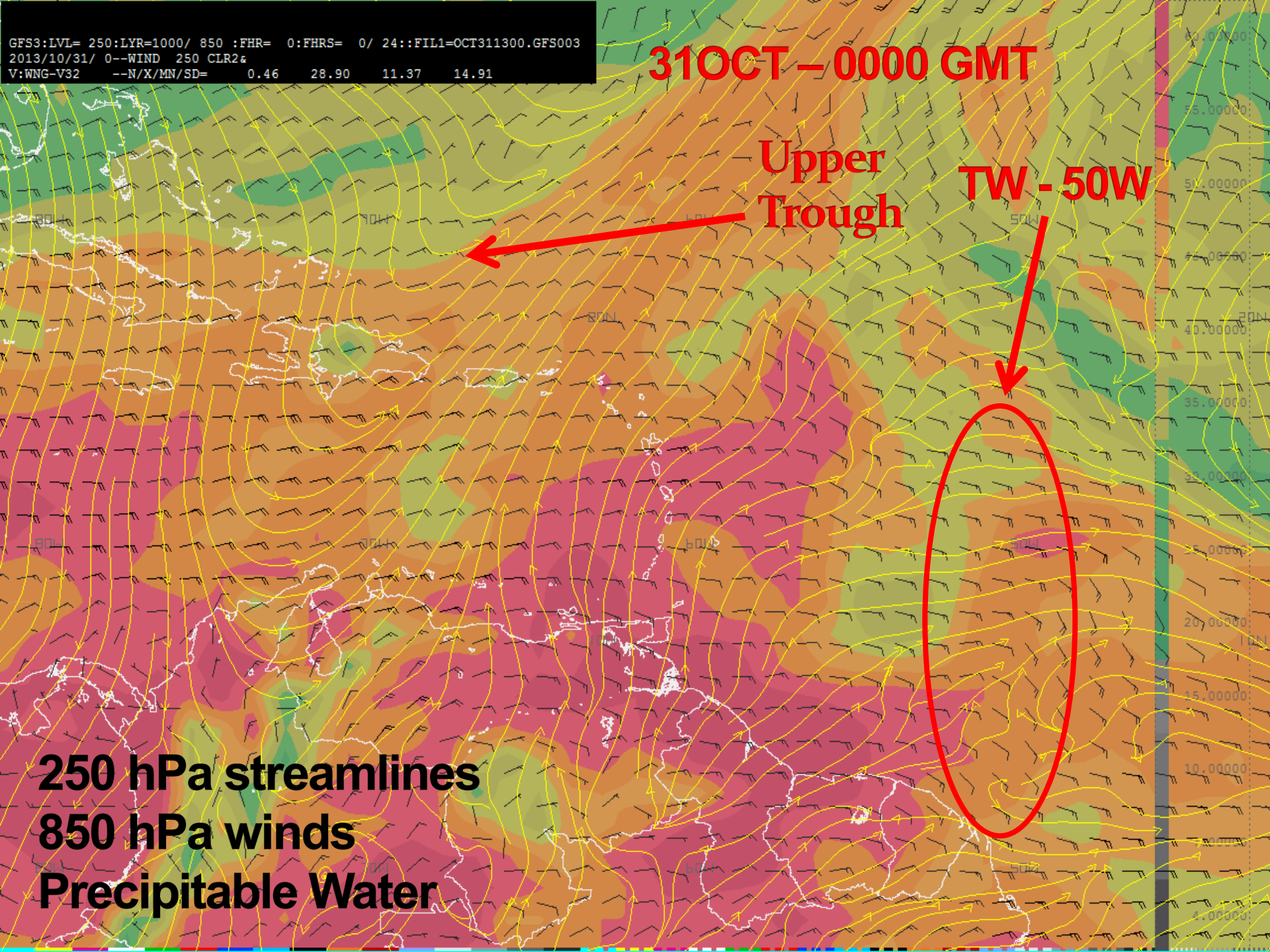
(C)
2 0002 G-13 IMG 4 1 NOV 13305 121500 04833 10249 08.00 RAMSDIS-CIRA/RAMM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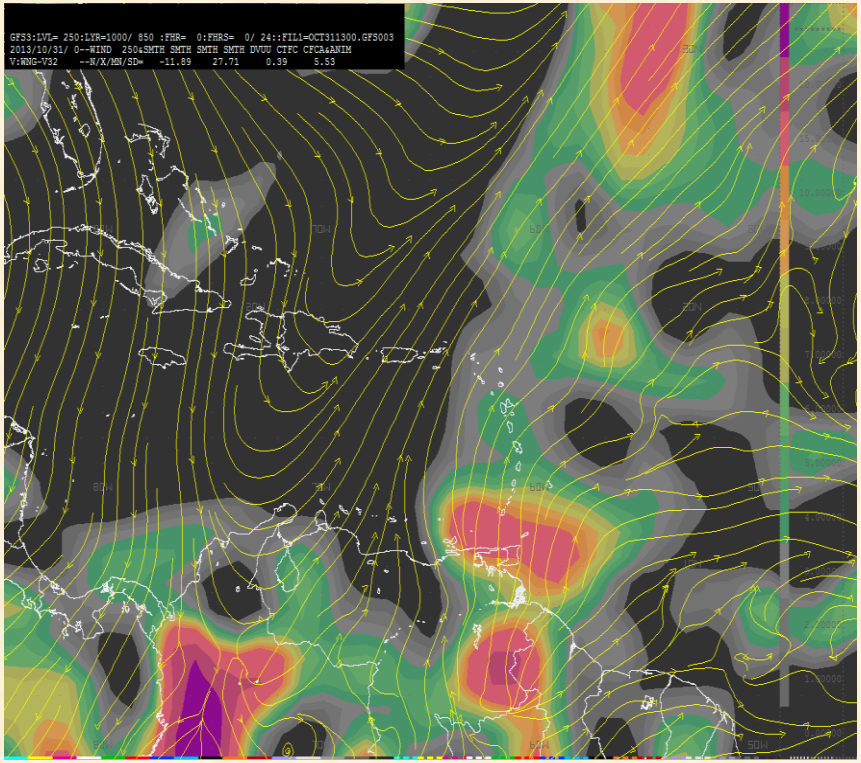
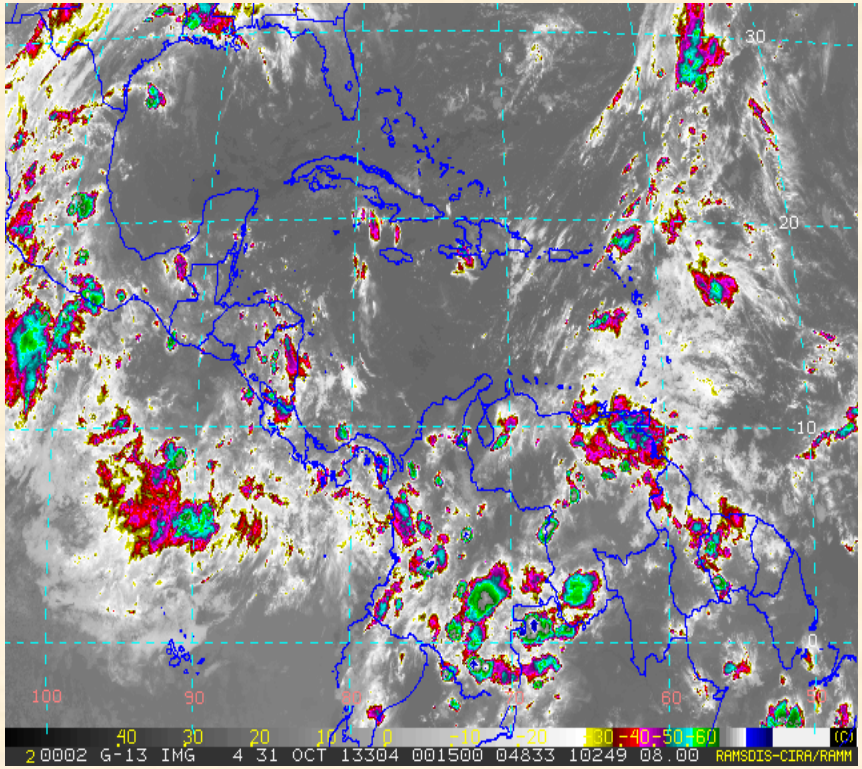
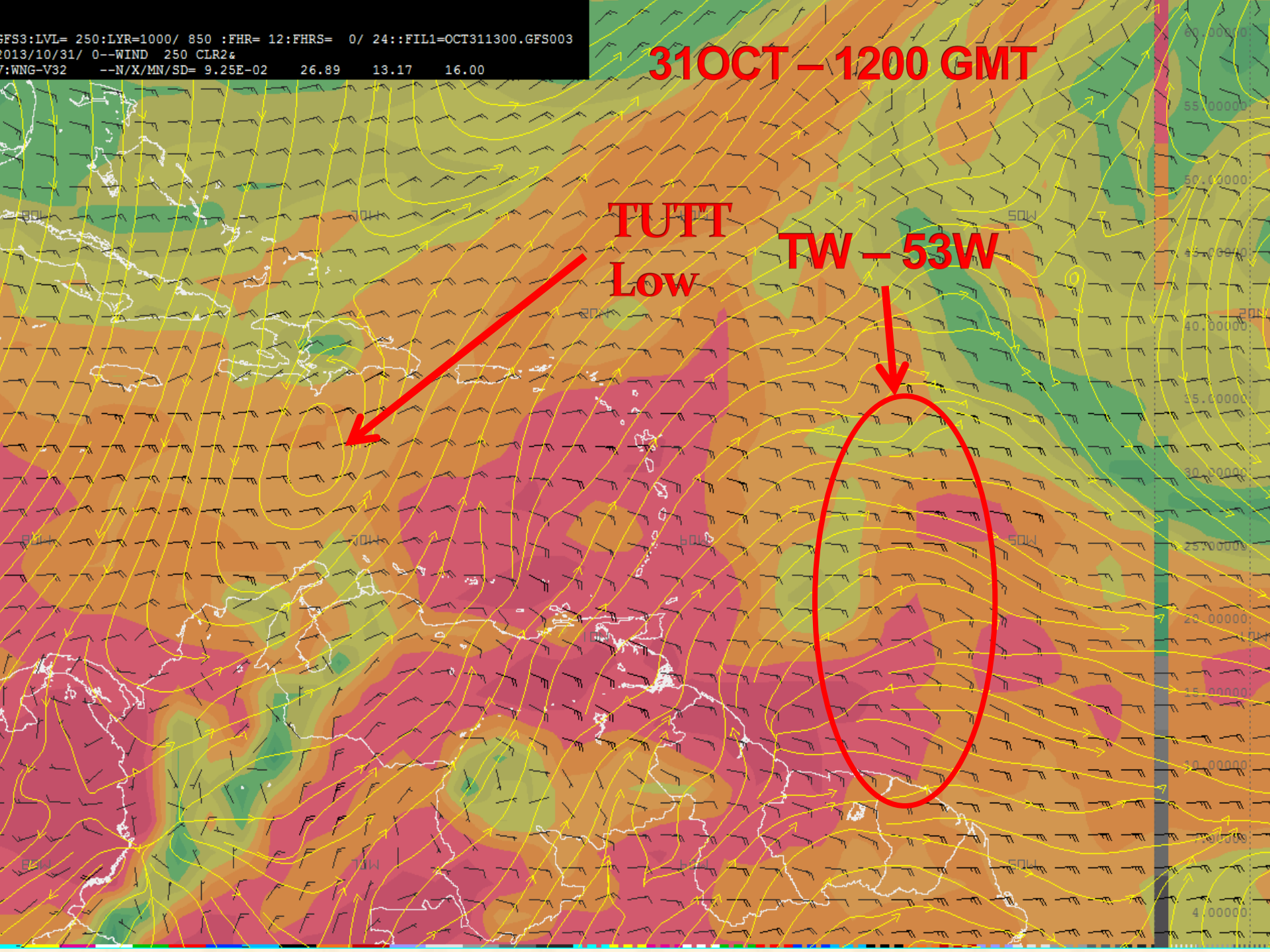
31OCT – 0000 GMT
Upper Trough
TW - 50W
250 hPa streamlines
850 hPa winds
Precipitable Water

250 hPa streamlines
500 – 250 hPa divergence





31OCT – 0000 GMT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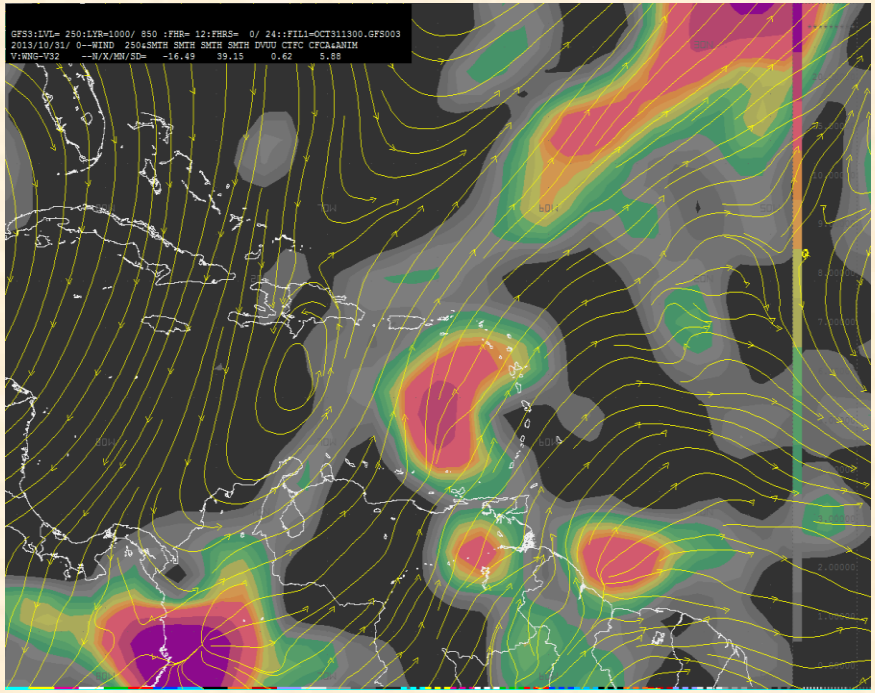
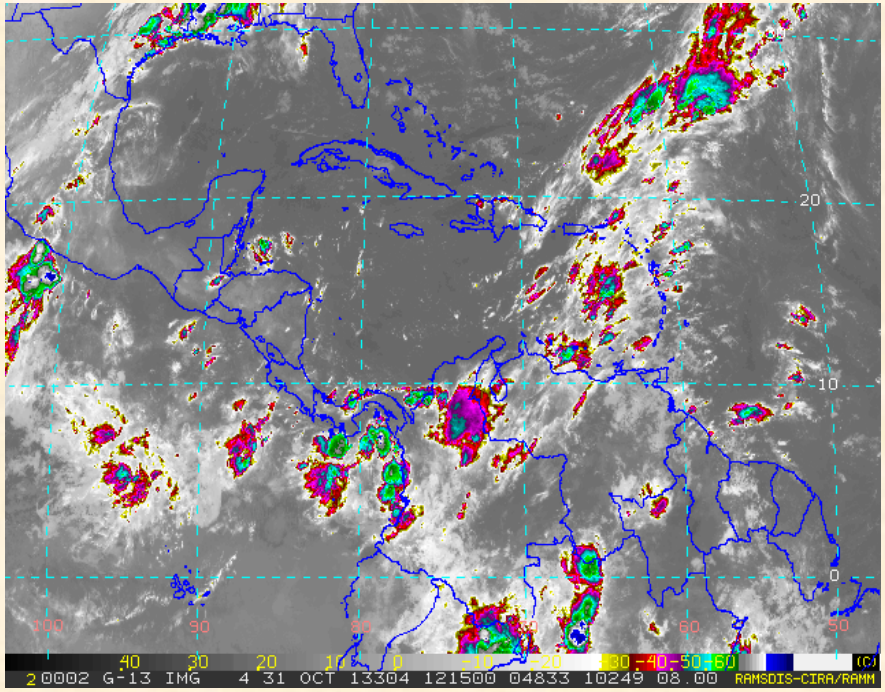
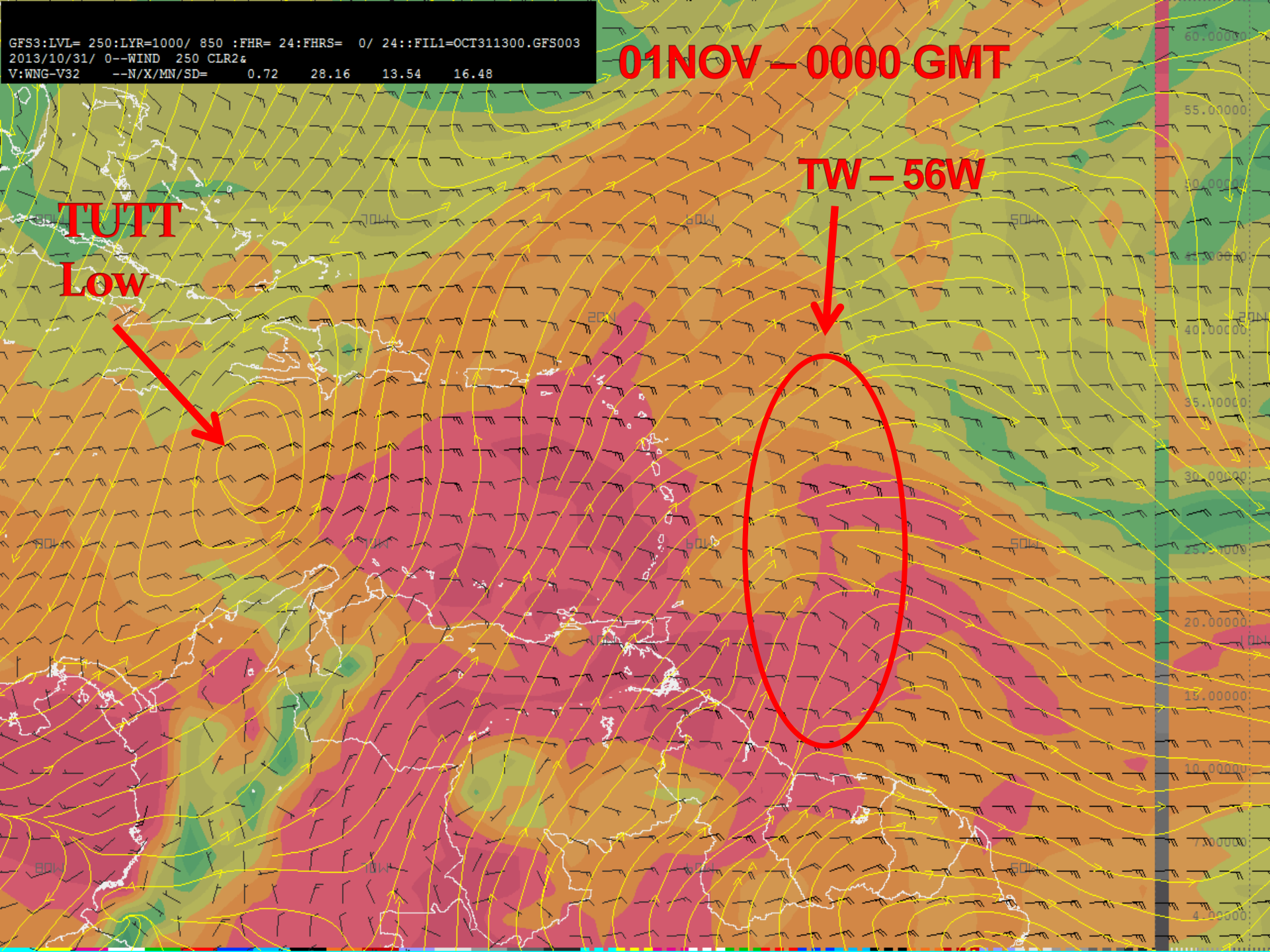
31OCT – 1200 GMT
TUTT
Low
TW – 53W





31OCT – 1200 GMT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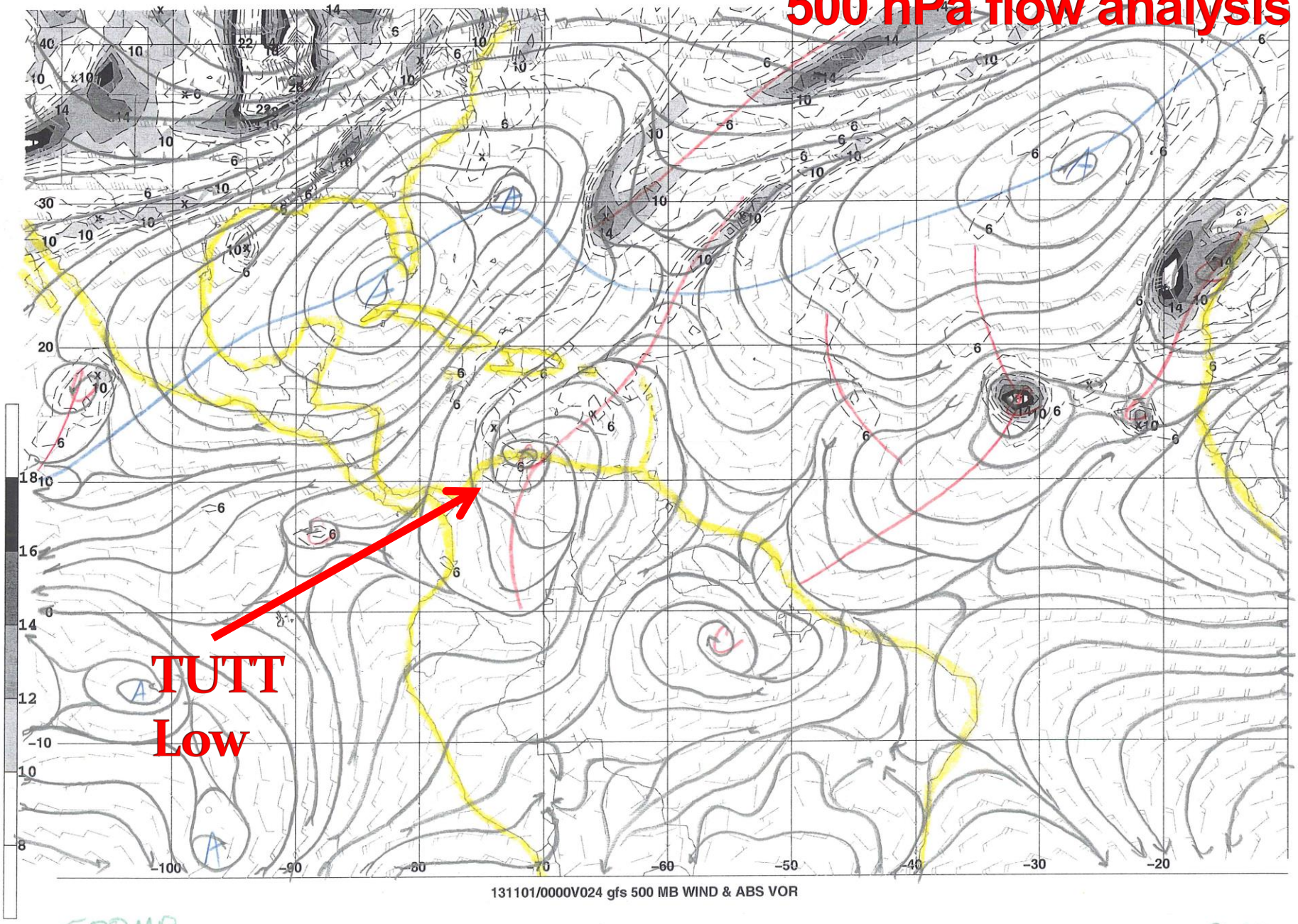
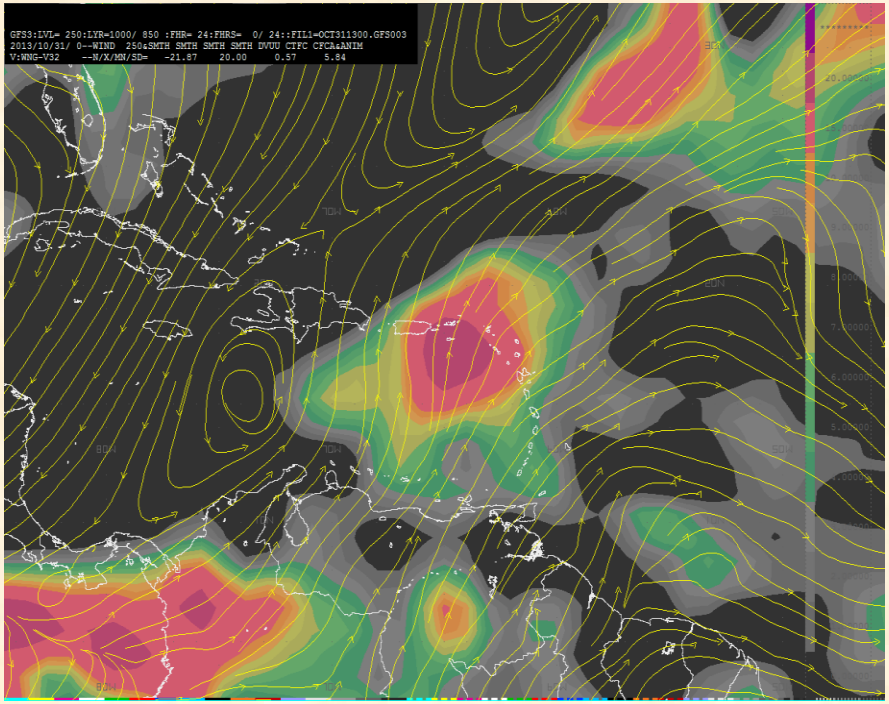
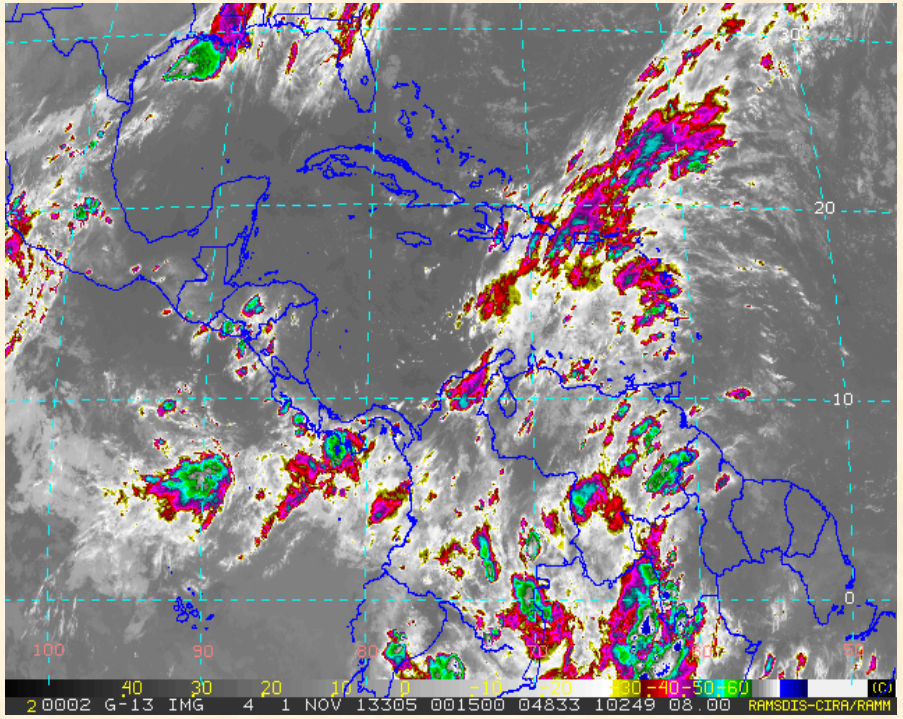
TW – 56W
TUTT
Low

500 hPa flow analysis







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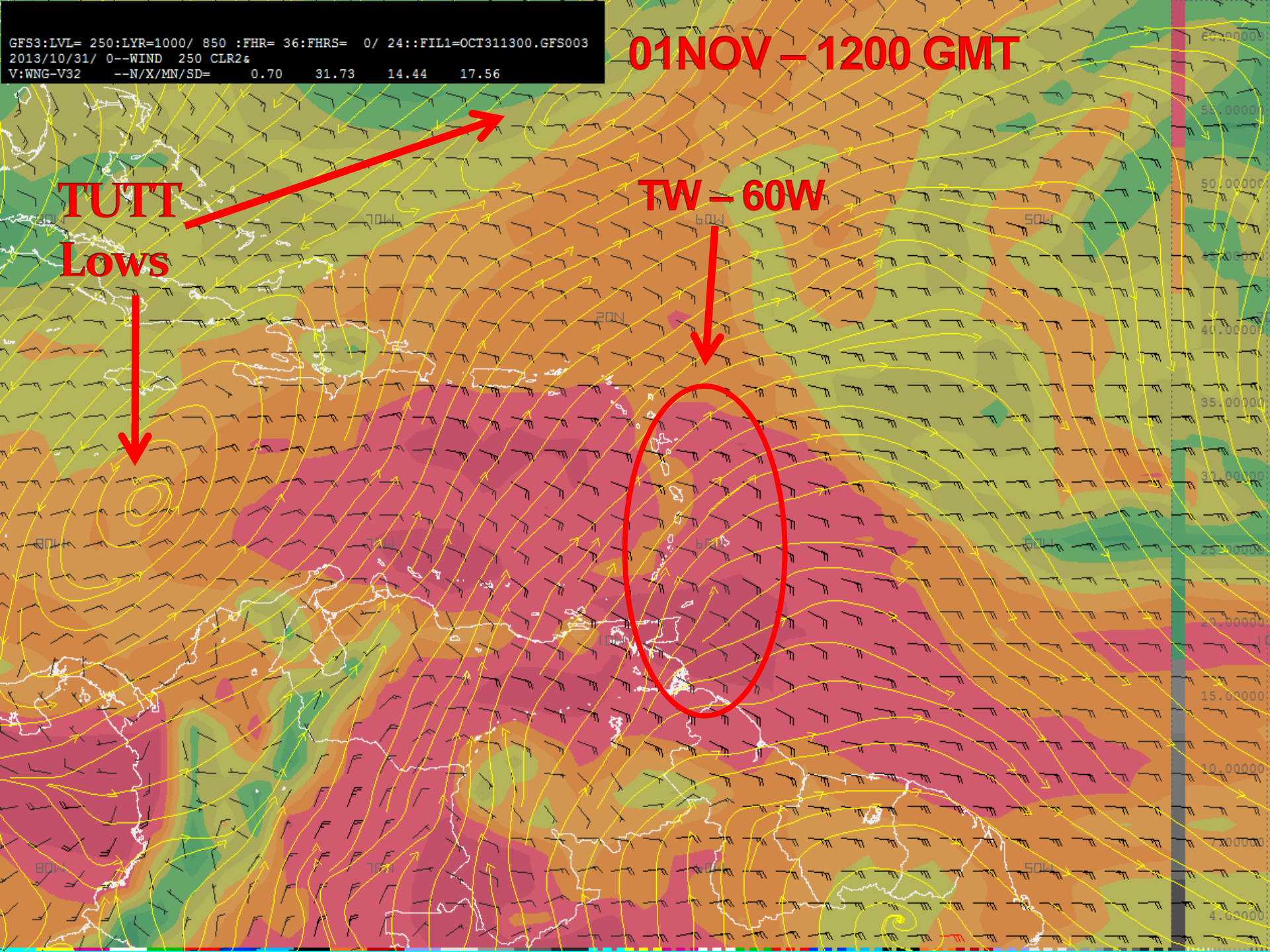
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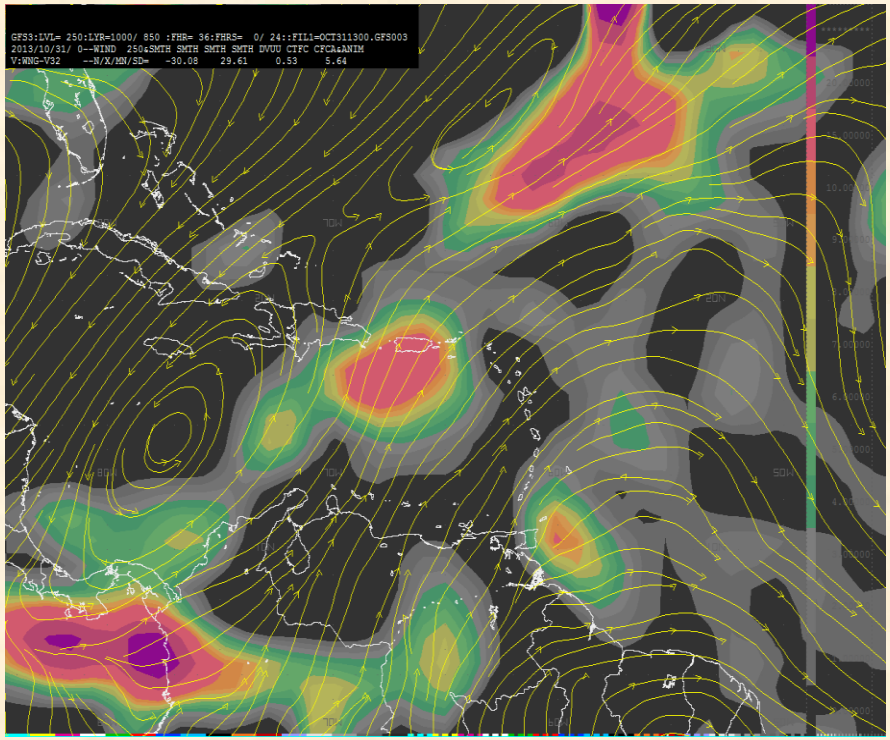
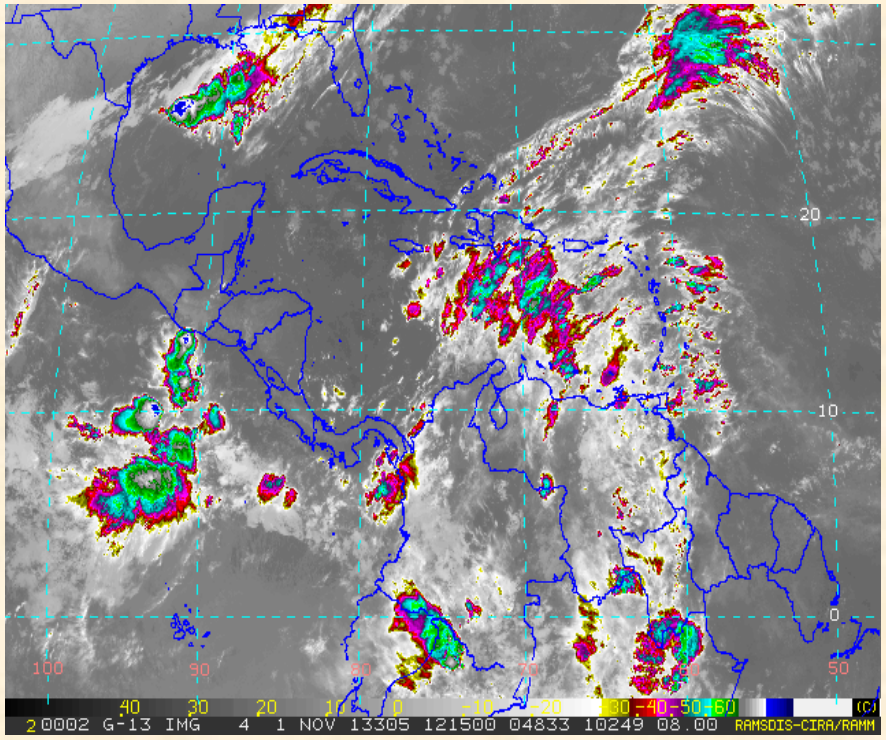
TUTT
Lows
TW – 60W





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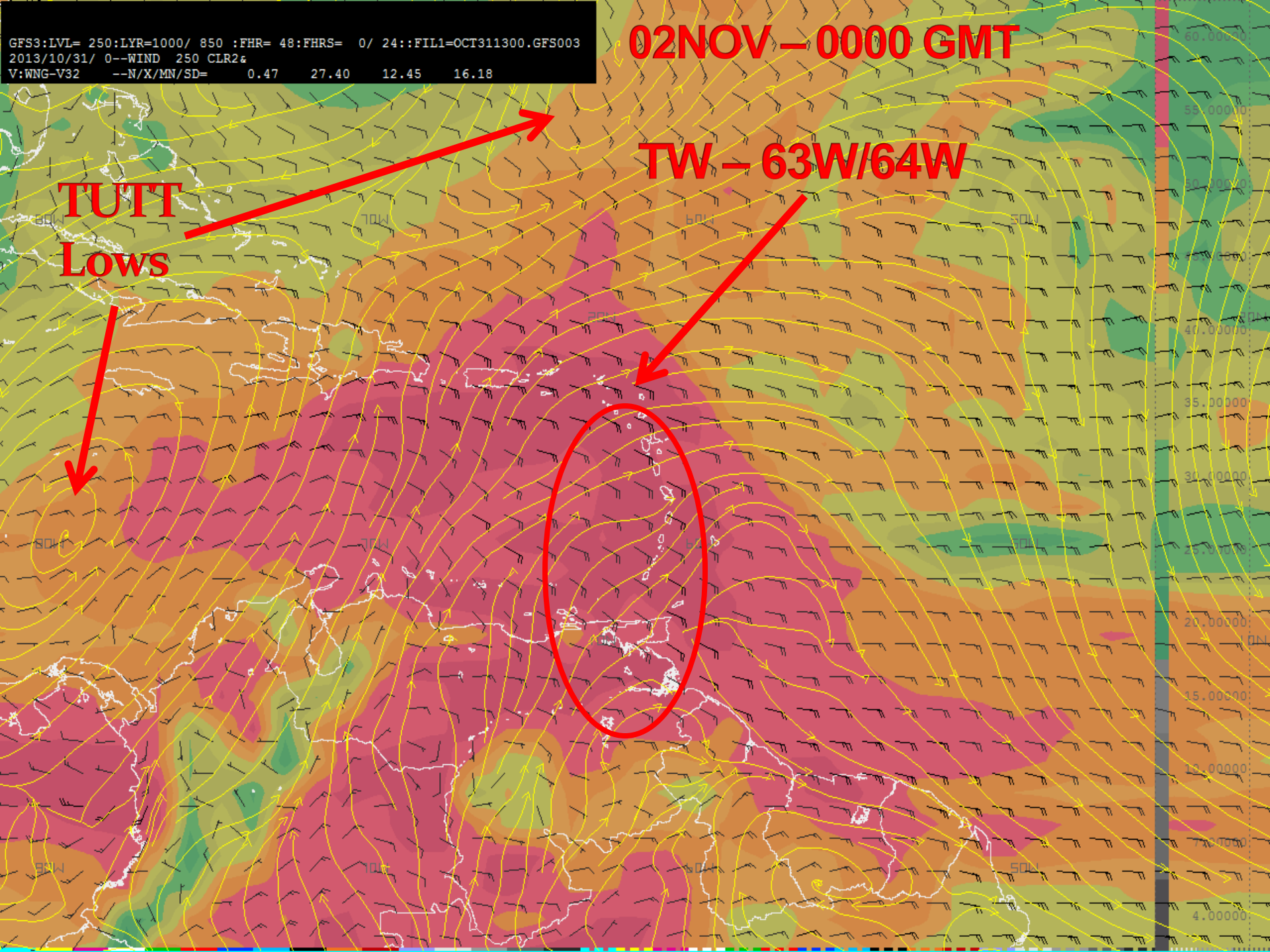
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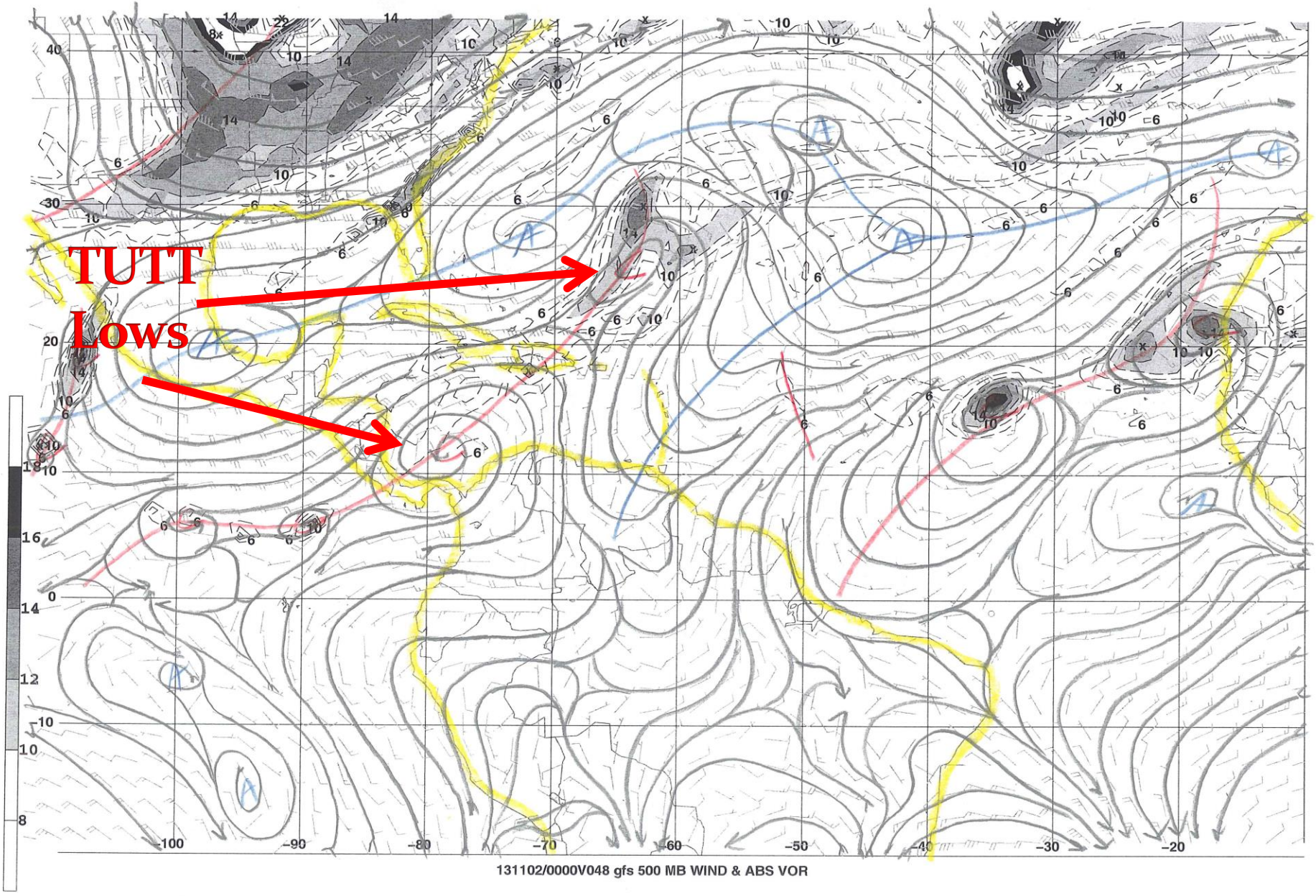
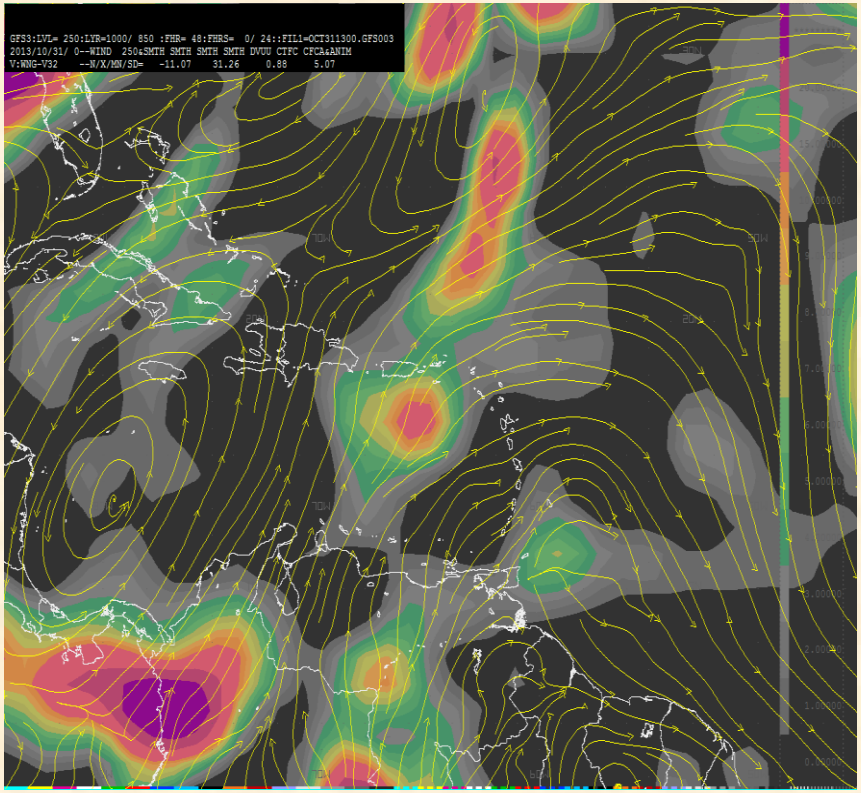
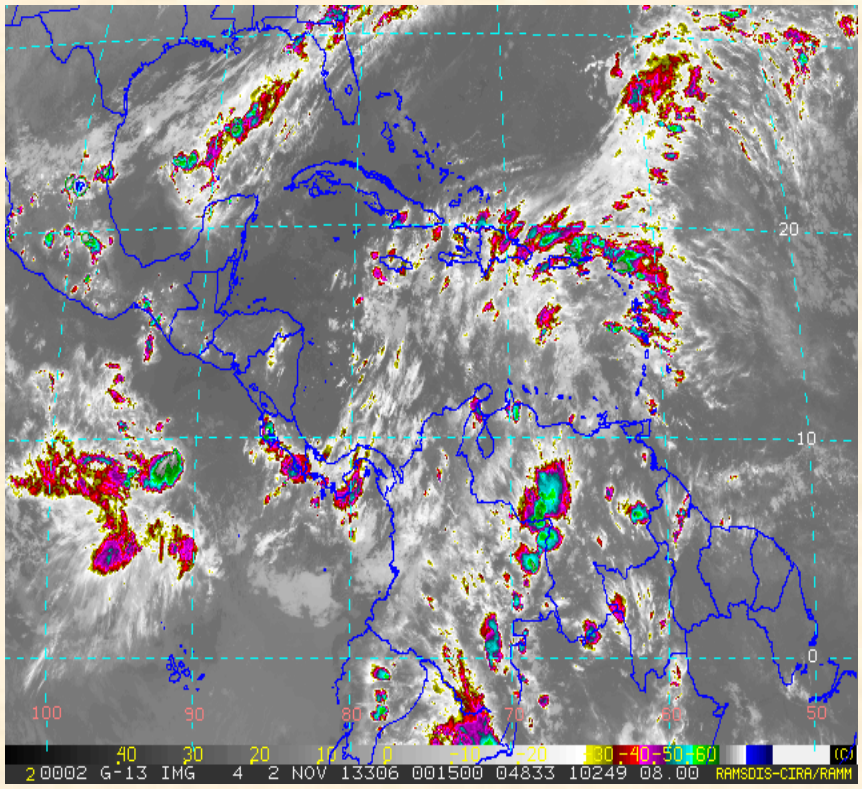
02NOV – 0000 GMT
TW – 63W/64W
TUTT
Lows



500MB

48HR





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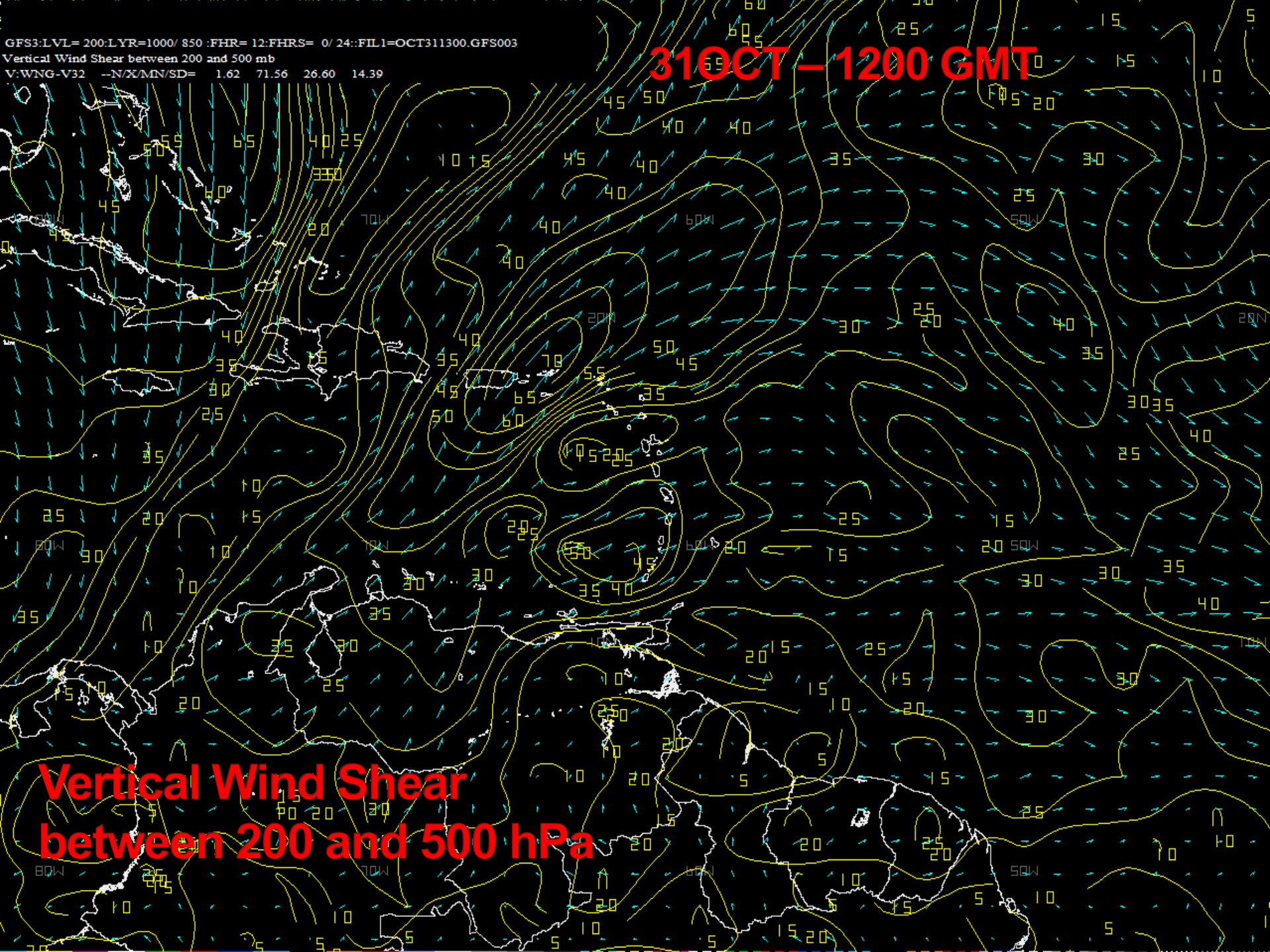
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Vertical Wind Shear between 200 and 500 mb
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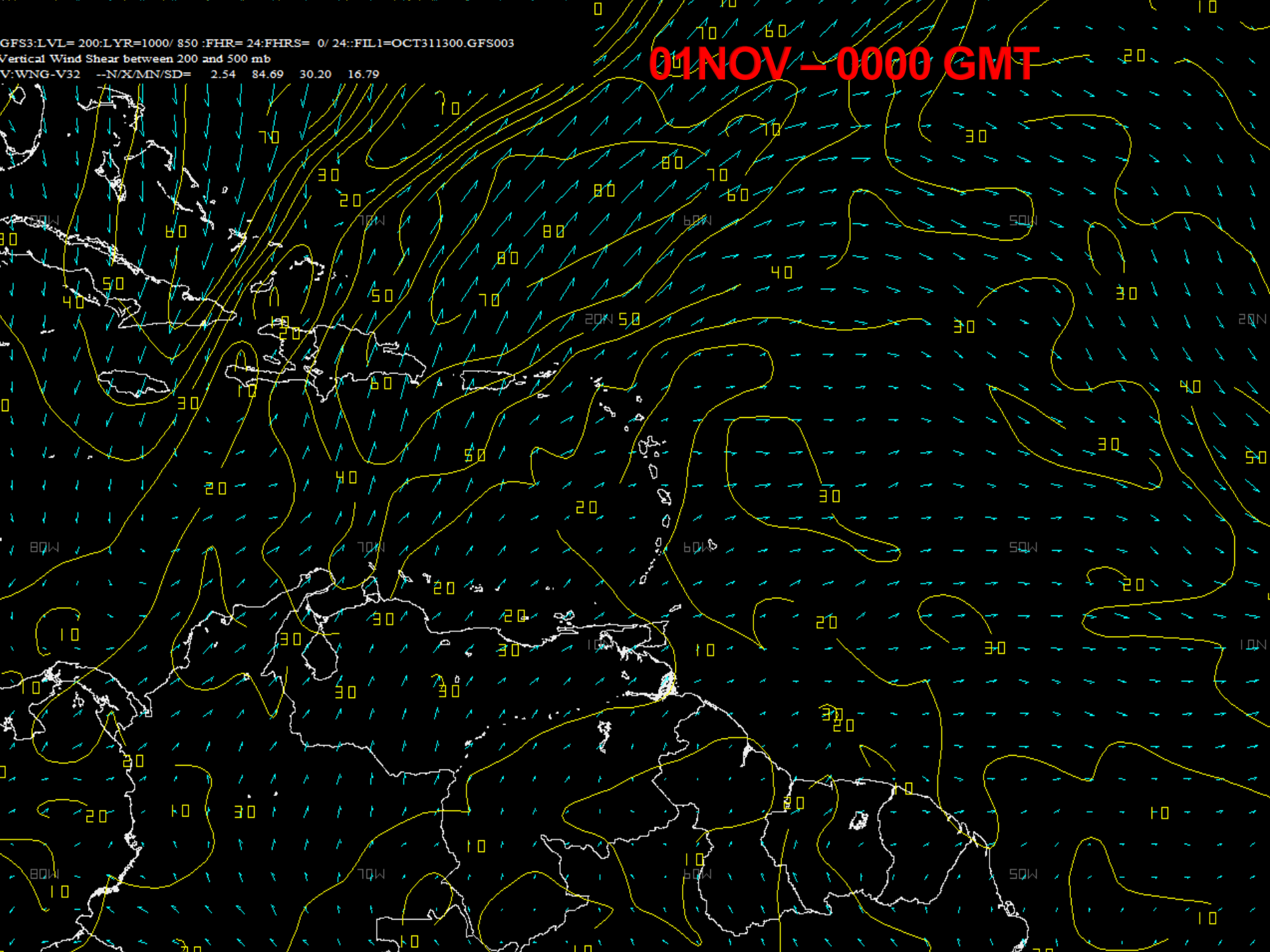
31OCT – 1200 GMT
Vertical Wind Shear
between 200 and 500 hPa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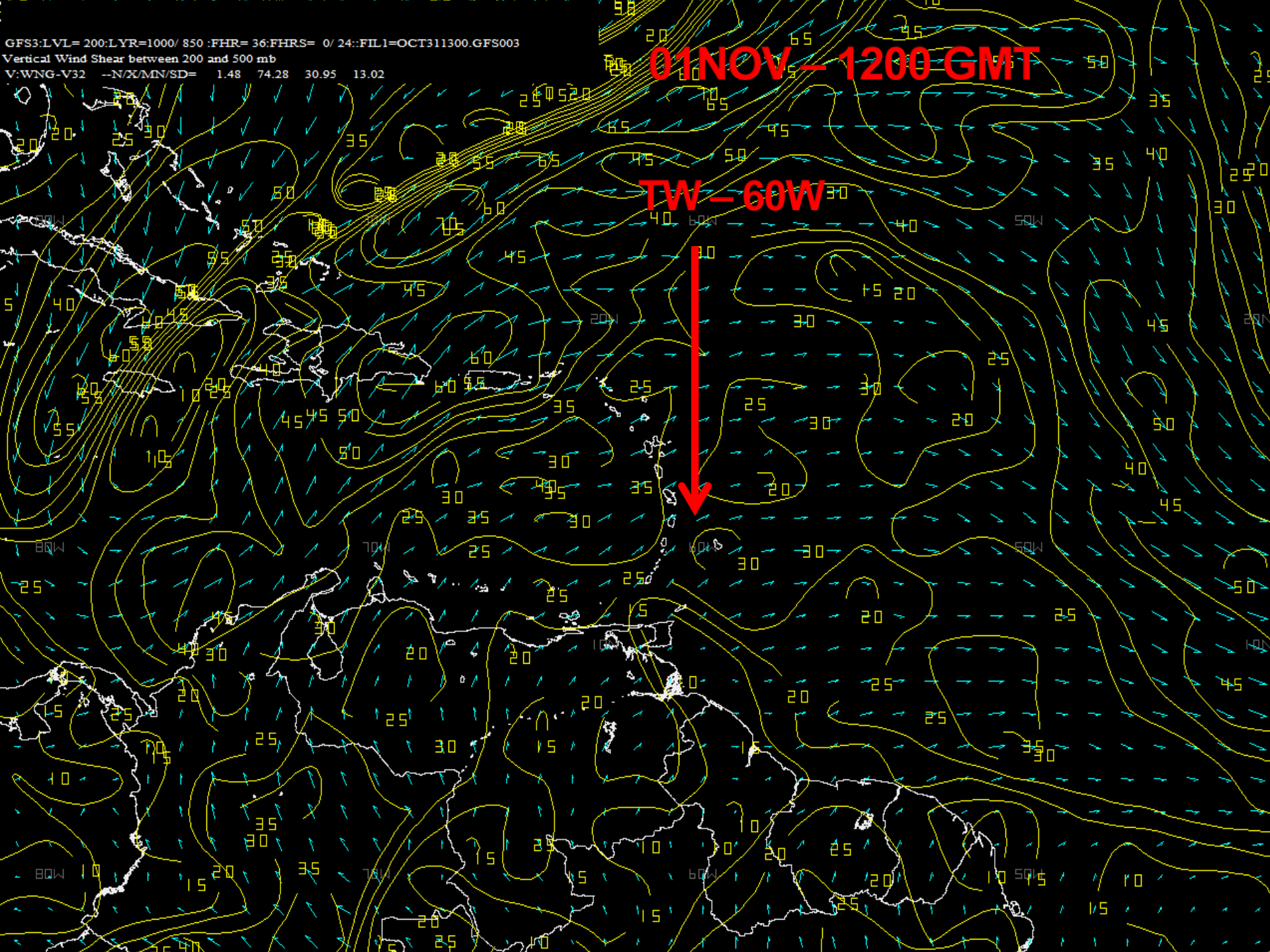
Vertical Wind Shear between 200 and 500 mb
V:WNG-V32 --N/X/MN/SD= 2.54 84.69 30.20 16.79
01NOV – 0000 GMT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Vertical Wind Shear between 200 and 500 mb
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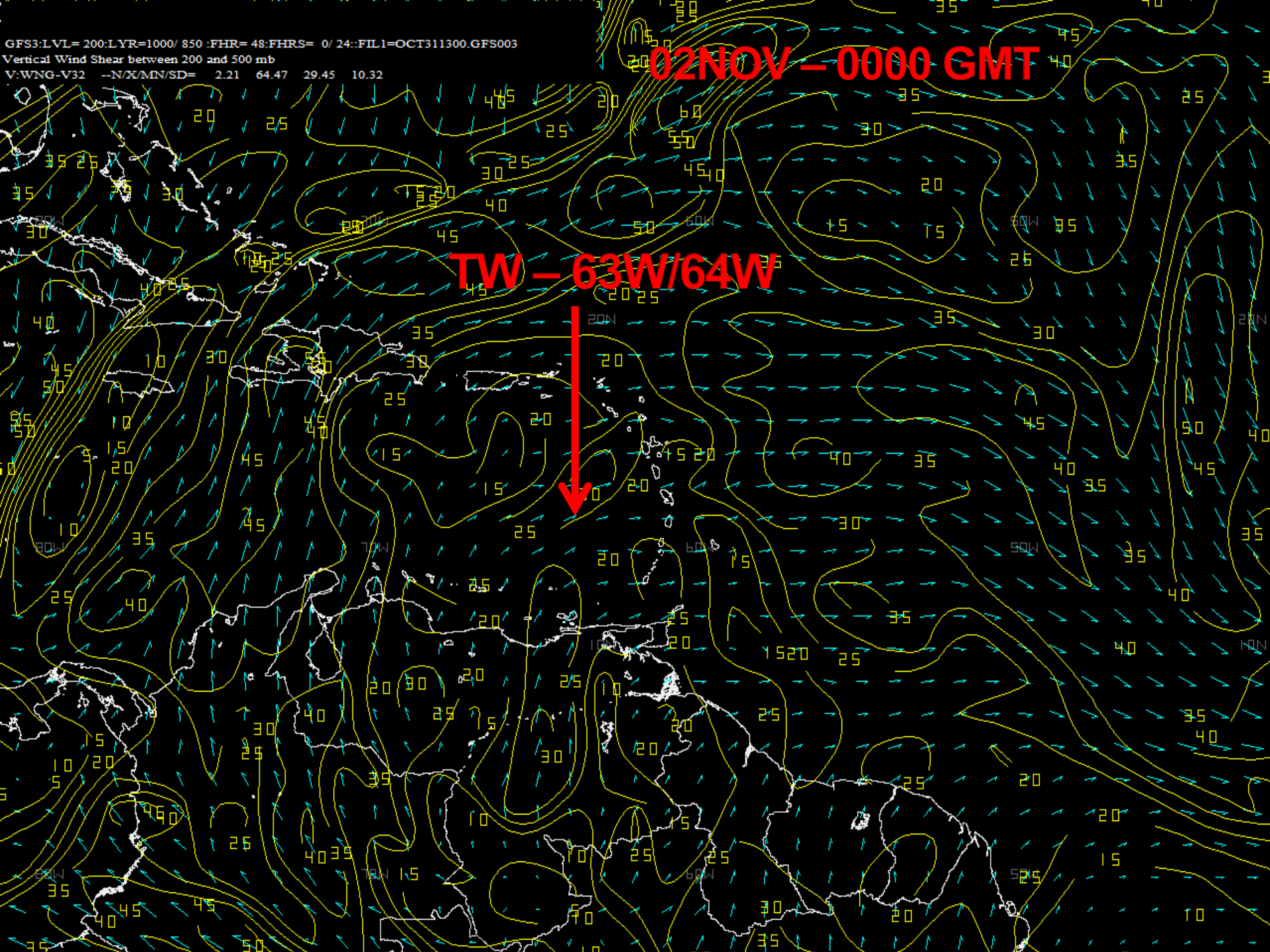
01NOV – 1200 GMT
TW – 60W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Vertical Wind Shear between 200 and 500 mb
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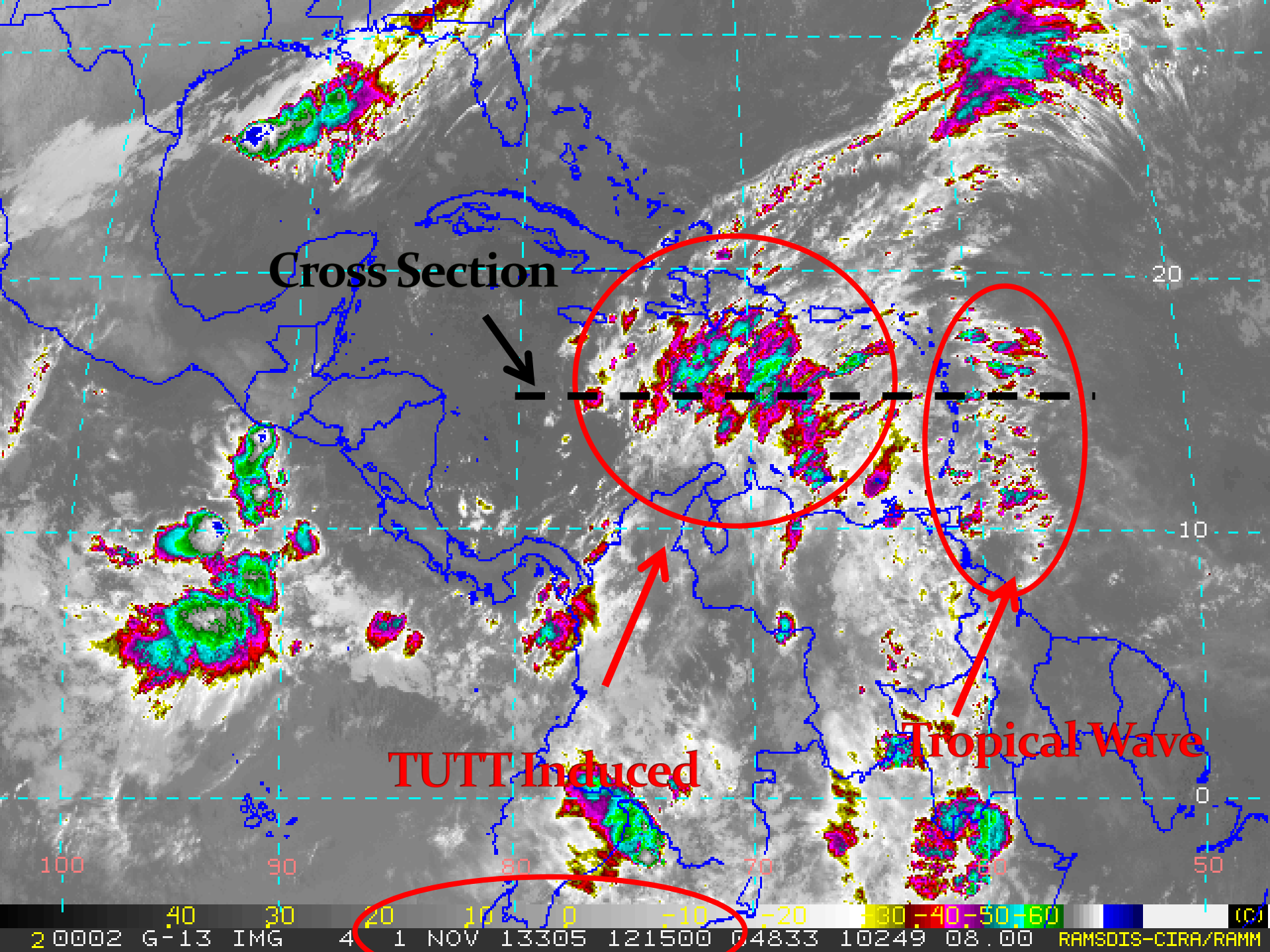
02NOV – 0000 GMT
TW – 63W/64W


Cross Section
TUTT Induced
Tropical Wave
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100
90
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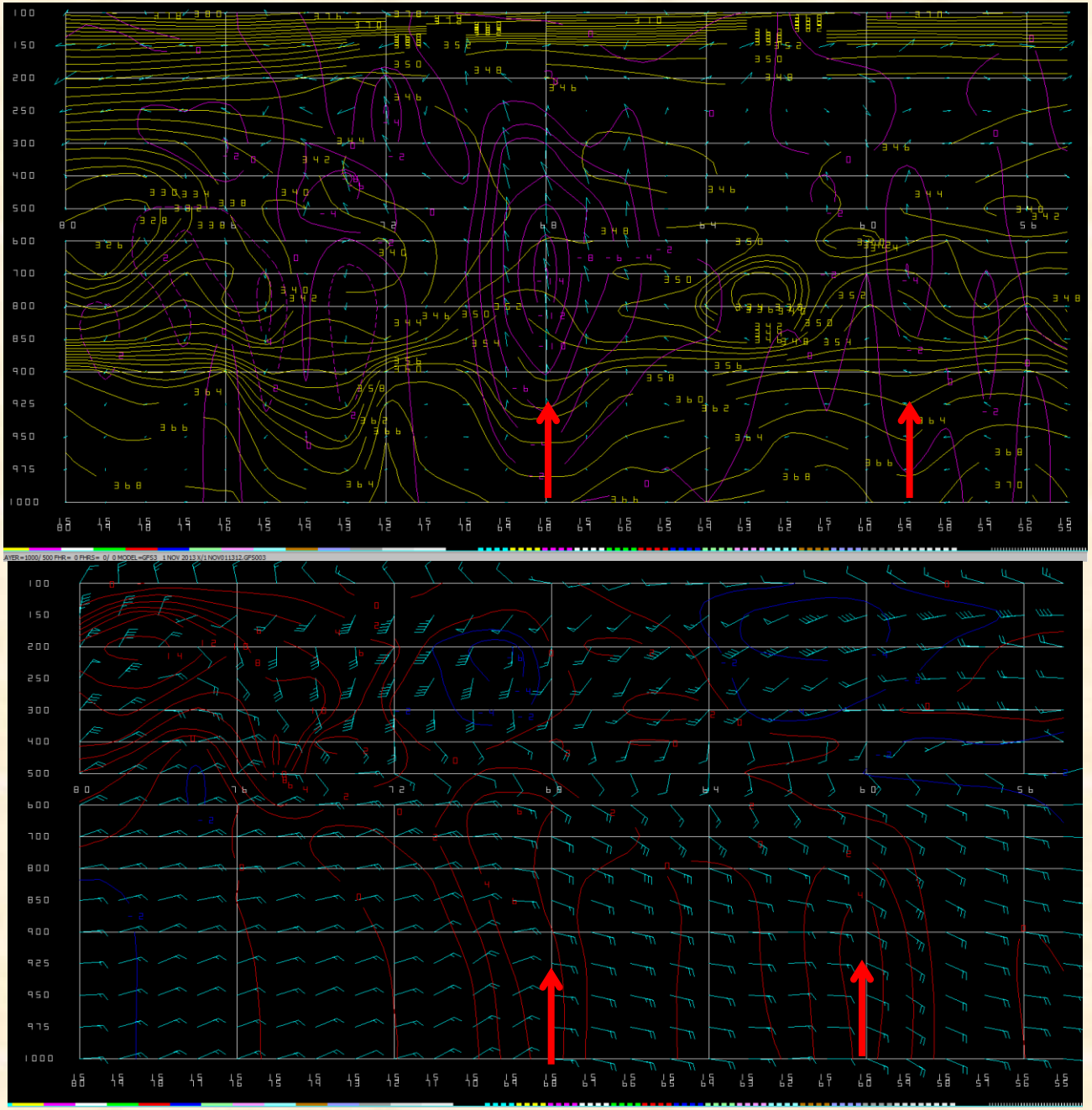
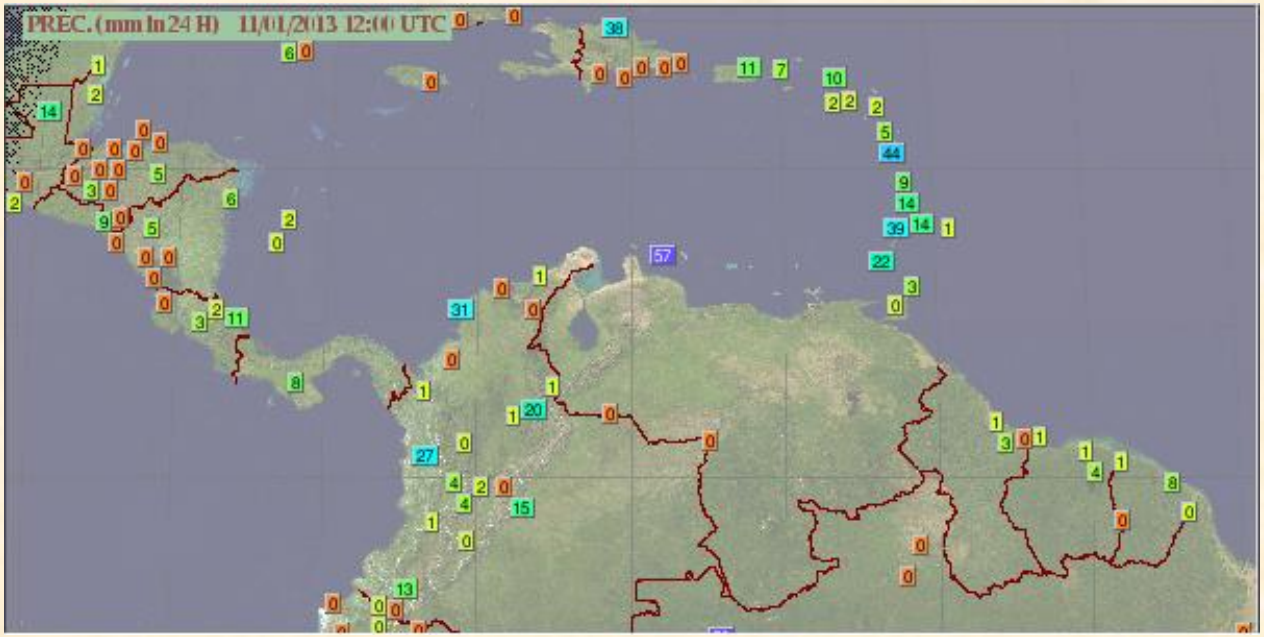
2 0002 G-13 IMG 4 1 NOV 13305 121500 04833 10249 08.00 RAMSDIS-CIRA/RAMM

Cross Section

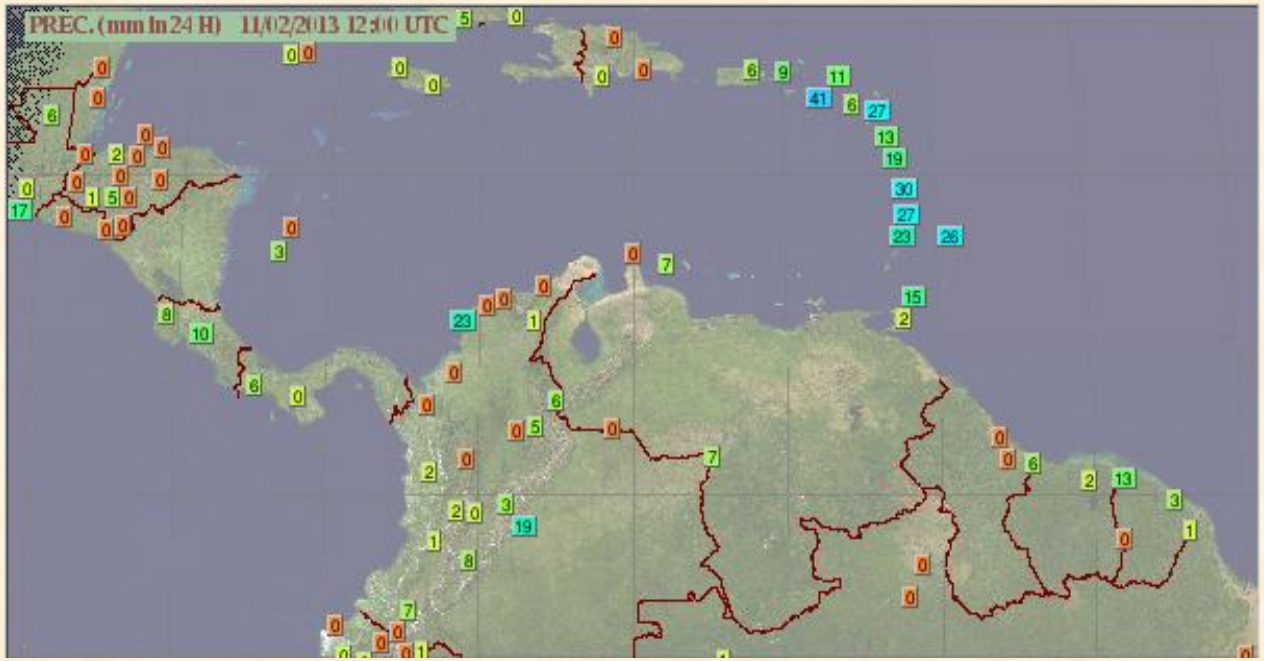
01NOV – 1200 GMT



Observations: 24 hr Rainfall Accumulations



01 Nov



02 Nov

Conclusions:

- The training supported the importance of the evaluation of the numerical models.
- Careful evaluation of the systems (scale, origin, vertical structure, movement, etc) was learned.
- Applied and highlighted the importance of the analysis of the thermodynamic and dynamic process.
- Understand the importance of the knowledge of climatology and the influences of topography in the forecasting.


Thank you!!!
Tropical Meteorology
is a challenge!!!!!

Questions