• JOSE MANUEL MEDINA HIDALGO
• SYNOPTIC METEOROLOGY AND FORECAST OFFICE
• DOMINICAN REPUBLIC
• TROPICAL DESK
MOTIVATION AND OBJECTIVES

• TO STUDY A CASE OF IMPORTANT HEAVY RAINFALL TYPICAL IN THE TRANSITION MONTHS IN THE DOMINICAN REPUBLIC.

• TO APPLY AND DEVELOP NEW TOOLS TO ANALYZE SIMILAR EVENTS NOT NECESSARILY ASSOCIATED TO THE HURRICANE SEASON.
REPUBLICA DOMINICANA
LOCATION

CLIMATIC CLASSES
- A - PERHUMID
- B4 - VERY HUMID
- B3 - HIGHLY HUMID
- B2 - MODERATE HUMID
- B1 - LOW HUMID
- C2 - MOIST SUBHUMID
- C1 - DRY SUBHUMID
- D - SEMIARID
- E - ARID

PUERTO PLATA CLIMO

PRECIPITACION NORMAL (mm)  TEMPERATURA MEDIA NORMAL (øC)
SYNOPTIC CONTEXT

● AFTER ~3 DAYS OF FAIR WEATHER UNDER THE INFLUENCE OF A MID-LEVEL RIDGE, THE NORTHERN PART OF THE DOMINICAN REPUBLIC WAS AFFECTED BY HEAVY RAINFALL.

● STRONG T-STORMS OCCURRED IN THE AFTERNOON OF OCT 26 WITH A SHEAR LINE INTERACTING WITH THE NORTHERN MOUNTAINS.

● DEEP CONVECTION FIRST DEVELOPED IN THE CENTRAL VALLEY TRIGGERED BY THE DIURNAL CYCLE

● THEN REFORMED TO THE NORTH IN THE SHEAR LINE CONVERGENCE REGION, AND WHERE SOUTHEASTERLY MID-UPPER SHEAR RELAXED THE RIDGE.
SYNOPTIC CONTEXT/TROPICAL DESK FORECAST
SST ANOMALIES

NOAA/NWS/NCEP/EMC Marine Modeling and Analysis Branch

RTG_SST Anomaly (0.5 deg X 0.5 deg) for 26 Oct 2014

SEA SURFACE TEMPERATURES WERE SLIGHTLY ABOVE CLIMATOLOGY (~0.5°C)
TIME SECTION FOR PUERTO PLATA
(GFS DATA OCT-26-2014 0000Z)

STORMS ~F12 - F24.

COLD AIR MASS
ADVECTED INTO THE
NORTHERN COAST.

MOISTURE FLUX
CONVERGENCE (MFC)

MOISTURE FLUX

POTENTIAL TEMPERATURE

TEMPERATURE
ADVECTION
DAILY MOISTURE FLUX CONVERGENCE (MFC) AVERAGED OVER 1000-900 HPA

ALL THE RUNS BEFORE THE EVENT WERE CONCISTENT ABOUT SUGESTING SOME VALUES OF MFC OVER THE NORTHERN COAST OF THE ISLAND
VORTICITY ADVECTION AND FLOW INTEGRATED IN A LAYER FROM 500 HPA TO 200 HPA.

-RED DOTTED LINES ARE NEGATIVE ADVECCION (ANTICYCLONIC)

-OTHERS COLORS (SOLID LINES) ARE POSITIVE ADVECTION (CYCLONIC).

CYCLONIC VORTICITY AND FLOW INTEGRATED IN A LAYER FROM 500 HPA TO 200 HPA.
OBSERVED RAINFALL

185.2 mm

137.6 mm

26/10/2014
CONCLUSIONS

• THE MID LEVEL TROUGHS PATTERN PROVIDED VORTICITY ADVECTION THAT RELAXED THE MID-UPPER LEVEL RIDGE AND ASSOCIATED DIVERGENCE ALOFT.

• WARM WATER ANOMALIES IN THE ATLANTIC CAN BE A RELEVANT PARAMETER FOR THIS KIND OF SITUATIONS.

• HIGHER RAINFALL AMOUNTS ARE EXPECTED IN INTERACTION WITH OROGRAPHY.