MM5-WRF at INM

DANIEL SANTOS-MUÑOZ , ALFONS CALLADO, JOSE A. GARCIA-MOYA,
CARLOS SANTOS AND JUAN SIMARRO.
Predictability Group
Spanish Meteorological Institute (INM). 28040 Madrid. Spain

MM5-WRF at INM

1. Computer Resources.

2. MM5 at INM-SREPS

3. High Resolution MM5 Simulations

4. Future work

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CRAY X1E

- INM´s Cray X1E :
  - 32 Nodes of 4 Multi-streaming Procesors (MSP) with 4 Single-Streaming Processors (SSP) each
    => 512 SSPs
  - 24 Nodes with 8 Gb of memory
    8   Nodes with 16 Gb of memory
    => 320 Gb
  - Node labels
    - 1 Node Support OS
    - 5 Nodes for SREPS
    - 5 Nodes for HIRLAM-ONR
    - 5 Nodes for HIRLAM-HNR
    - 1 Node for pre-processing
    - 5 Nodes for post-processing
    - 2 Nodes for application
    - 7 Nodes for users

- Disk space:
    8 TB directly attached disk
    24 TB in Storage Area Network (SAN)
    60 tapes of 300 Gb each
    => 50 TB
- Gigabit Ethernet

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- SREPS is multi-model multi-initial conditions with 72 hours forecast integrations twice a day (00 & 12 UTC).

GFS   IFS   GME   UM
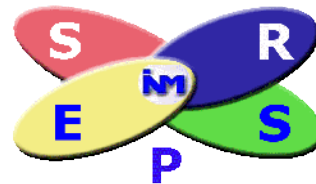
HIRLAM

HRM

MM5

UM

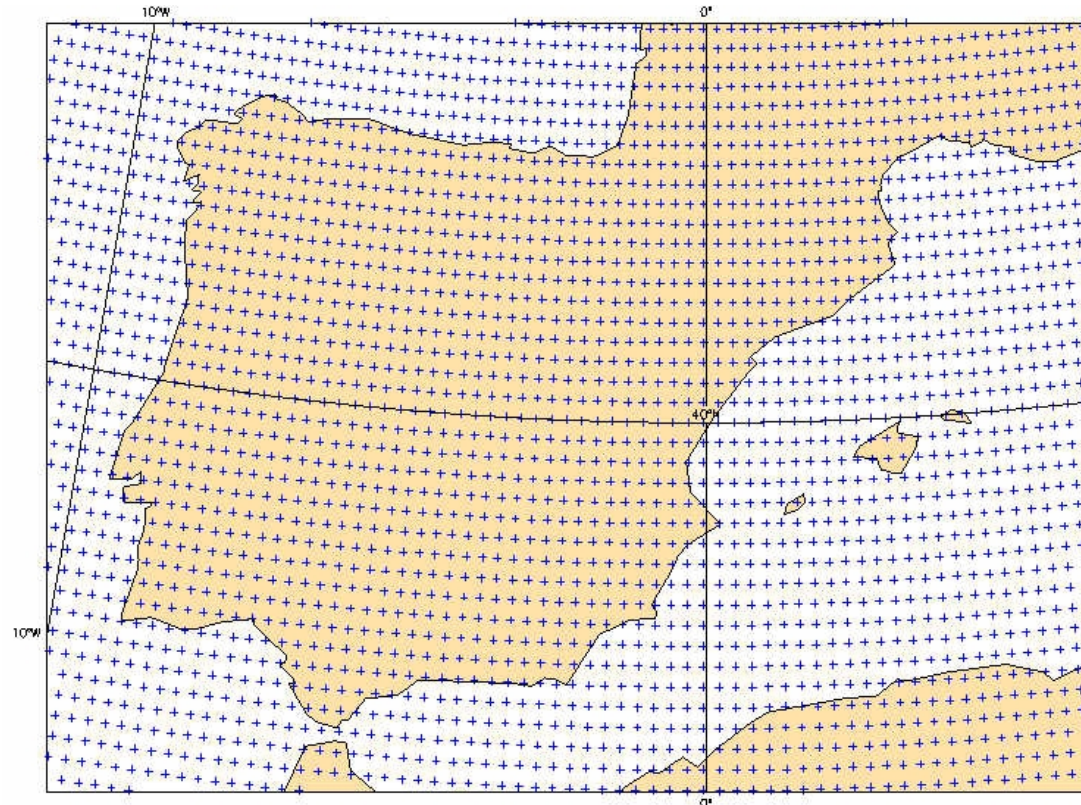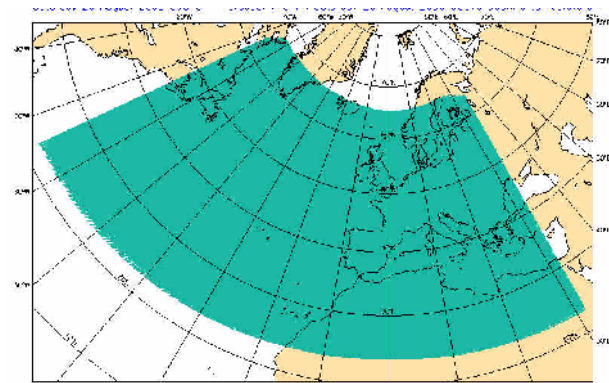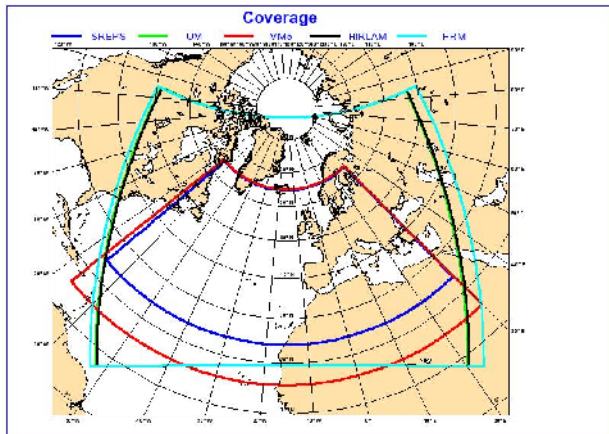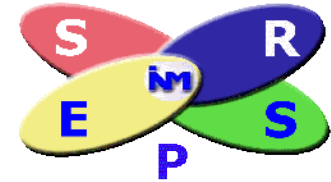COSMO

- 5 LAM models

- 4 IC´s & BC´s from Global models

20 ensemble members

SREPS DESCRIPTION

- 0.25 º horizontal resolution and 40 vertical levels

- The models outputs are codified in GRIB

Run: D-7, 12UTC , H+00 , H+06 , H+12 , H+18 , H+24 , H+30 , H+36 , H+42 , H+48 , H+54 , H+60 , H+66 , H+72

MSL Pressure & 6h Accumulated Precipitation

- **Models X Boundaries**

Probability Maps
6h Accumulated Precipitation
Forecast range (HH+06..HH+72) X Thresholds (1,5,10,20)

- F

- Spread &
  - Z500
  - Msl Press

- 24h accumulated precipitation forecast 06UTC-06UTC against observed 07UTC-07UTC
  - Checked in HH+030 and HH+054
- ~90 days (Apr1 to Jun30 2006).
- Few different rain gauge networks as references:
  - INM network
  - European network
- Verification method
  - Interpolation to observation points
- Verification software
  - ~ ECMWF Metview + Local developments
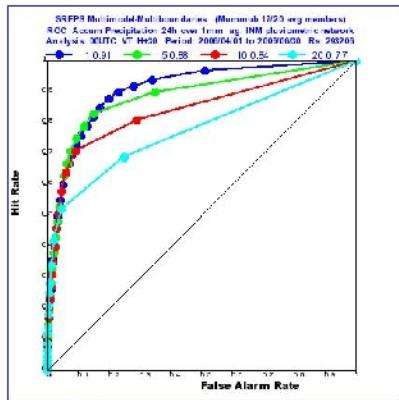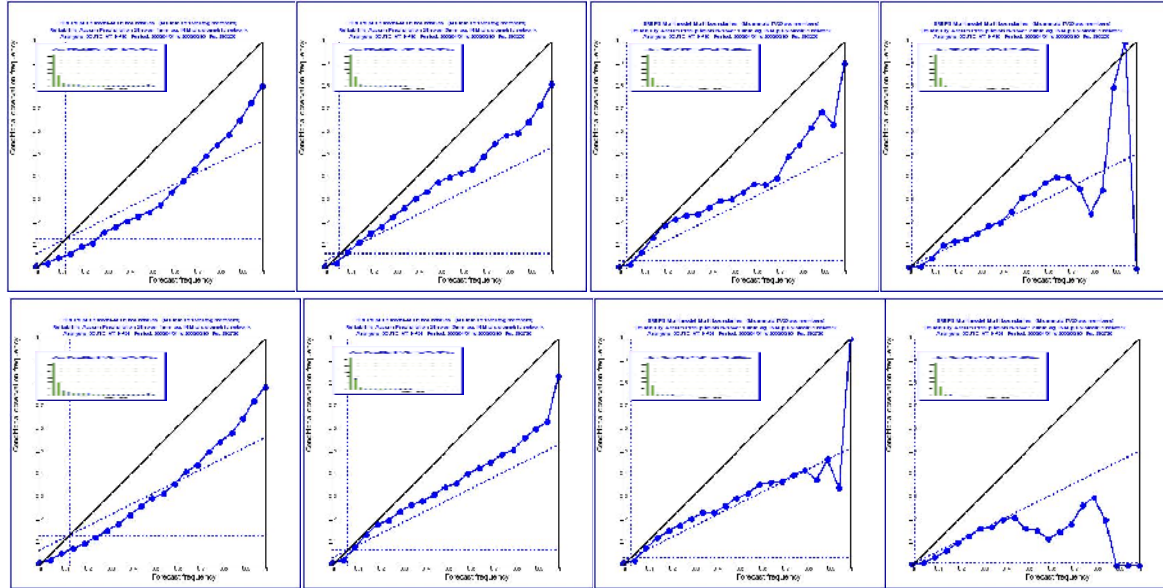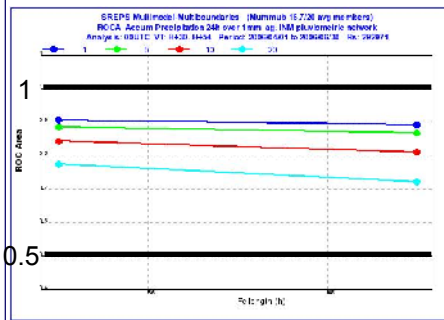- Performance scores
  - ECMWF recommendations
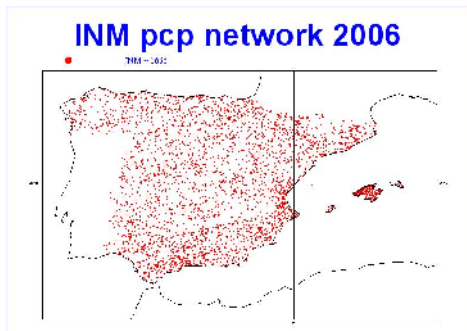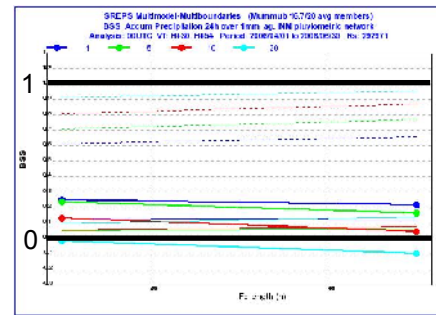
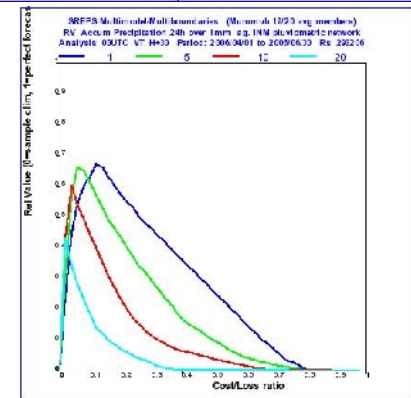ROC ROCA BSS Relative Value

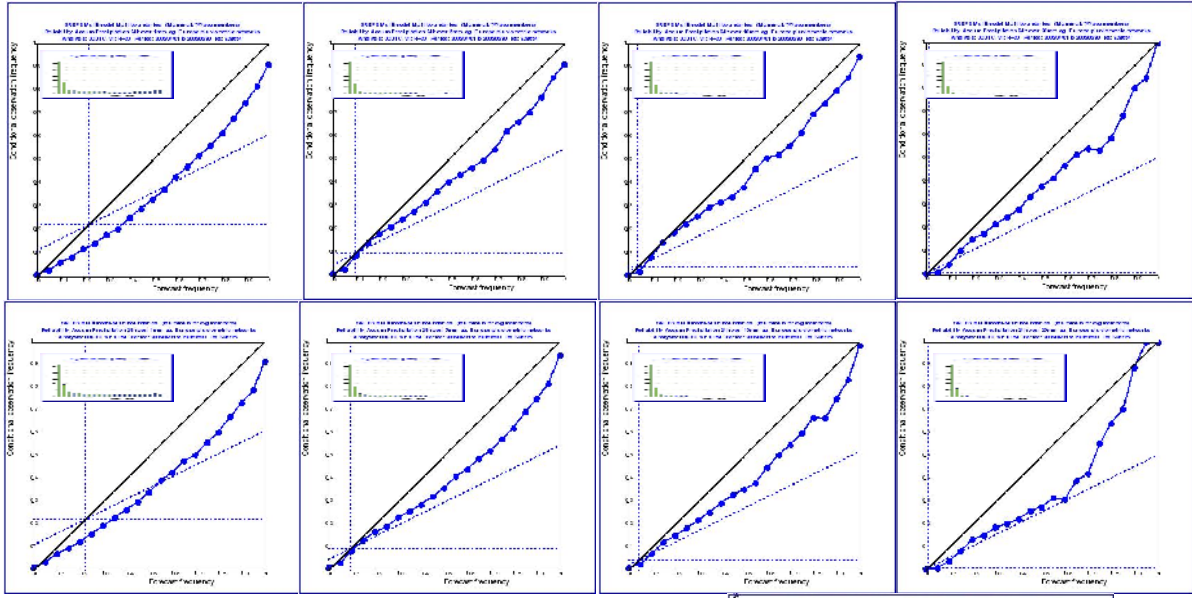# SREPS PERFORMANCE
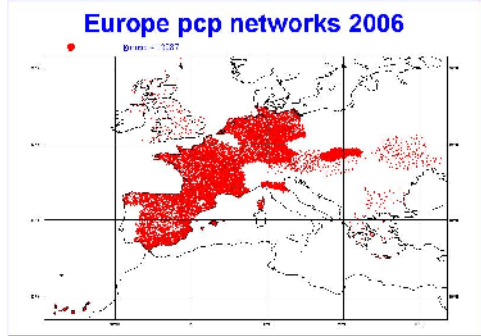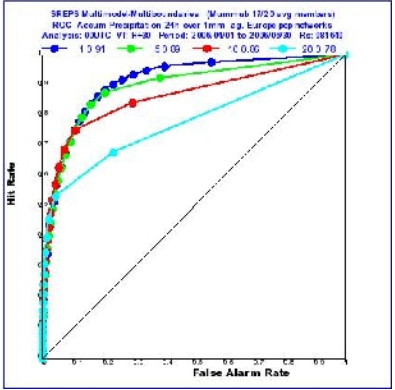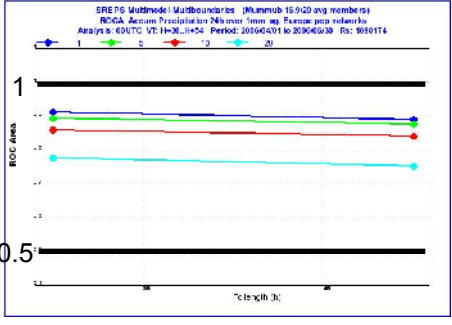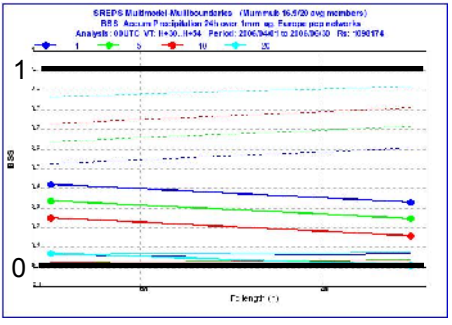
>=1mm >=5mm >=10mm >=20mm

Europe pcp networks 2006

HH+30

HH+54
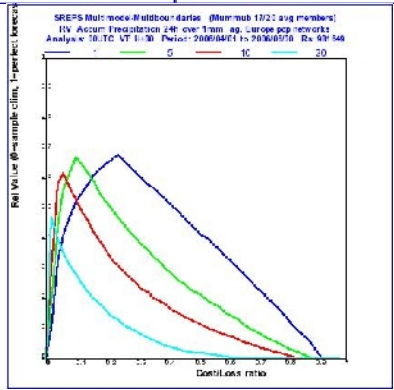
ROC   ROCA   BSS   Relative Value

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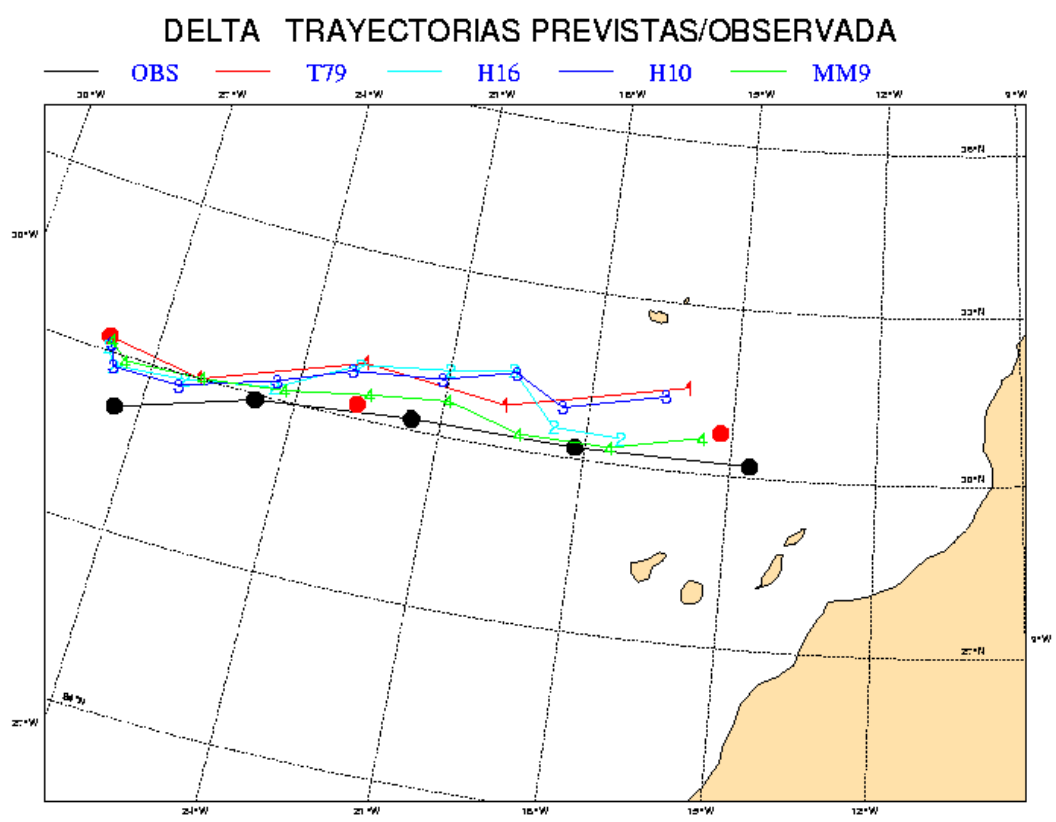used

15

TROPICAL STORM DELTA
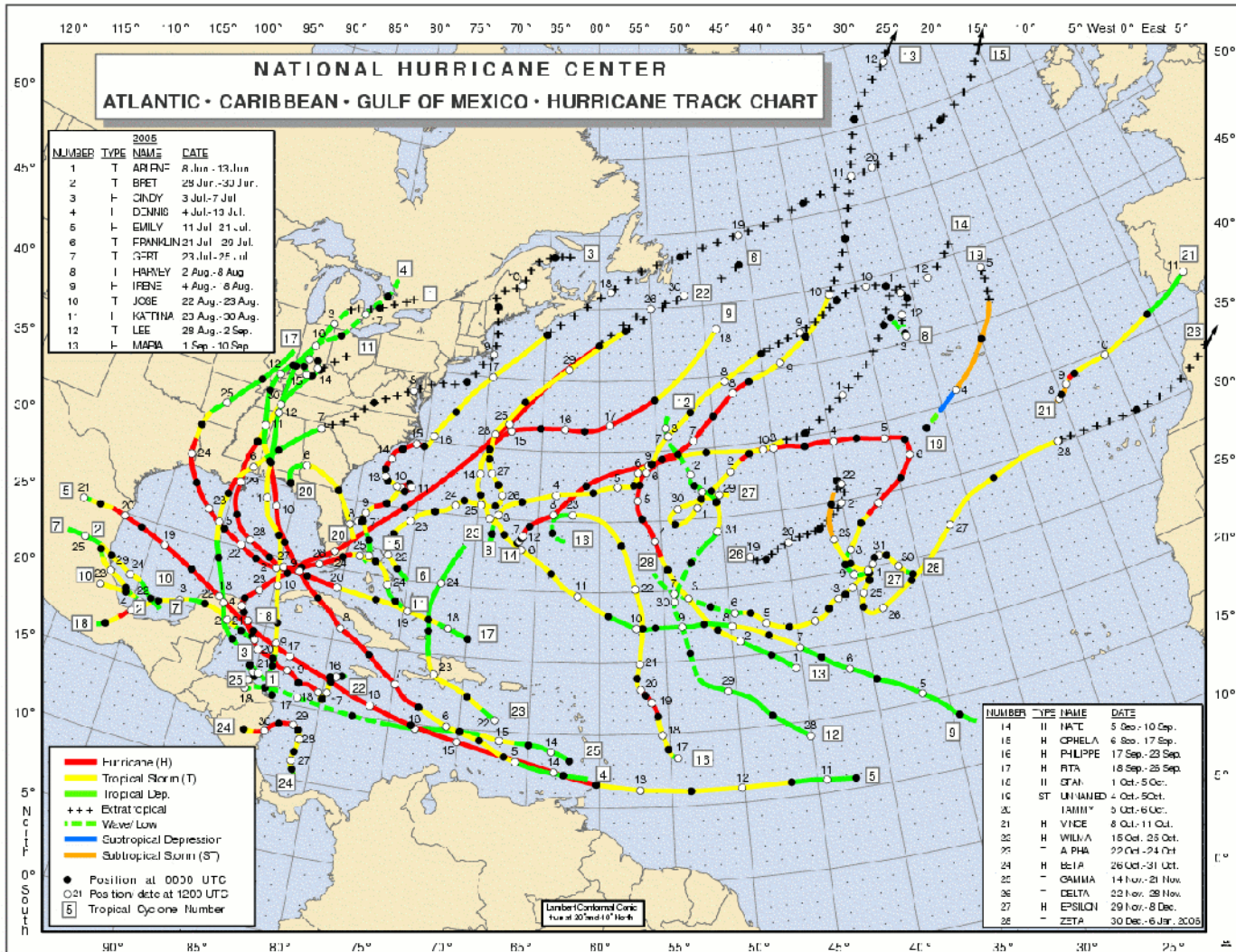
• Due to political and economical impact of Delta a deep study of this   storm was performed.

http://

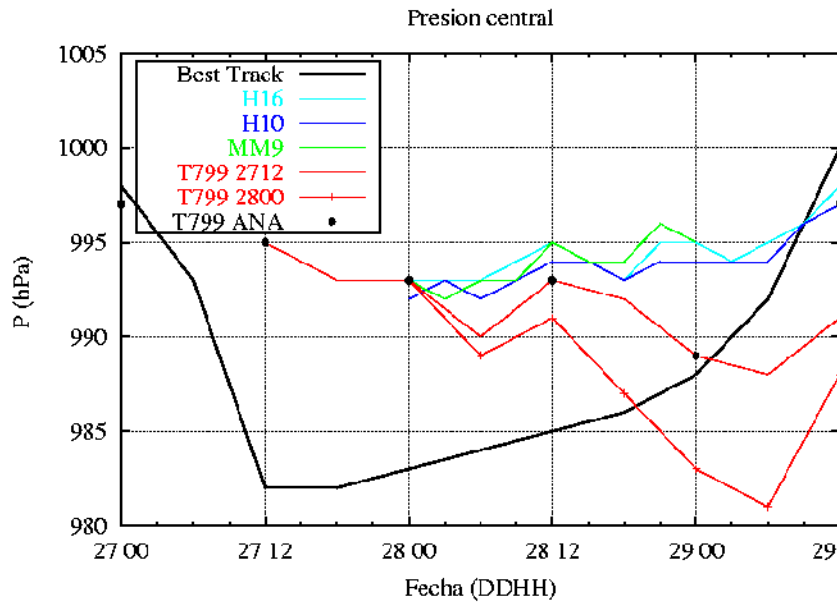www.inm.es/web/sup/ciencia/divulga/nota_delta/c

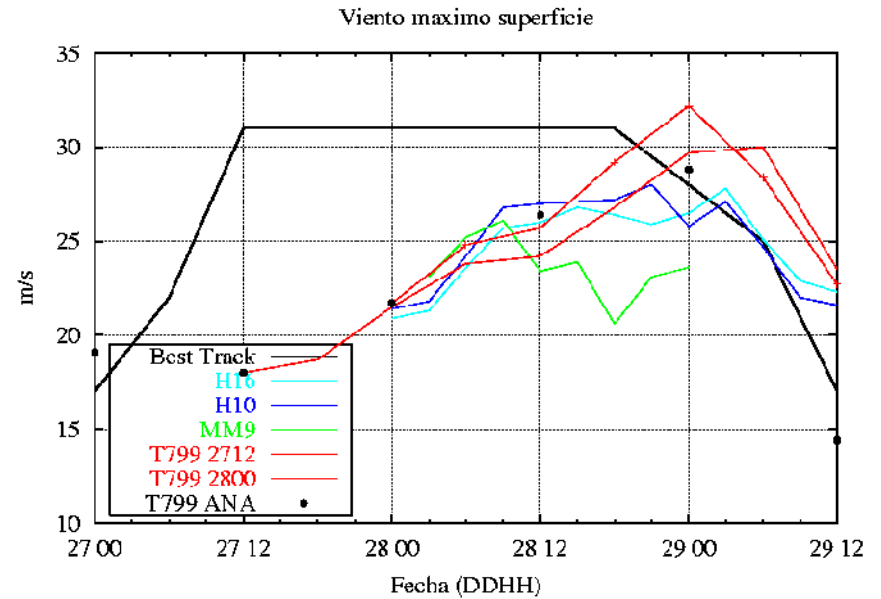• Hirlam and MM5 high resolution simulations were done for this technical note.

• Tracks
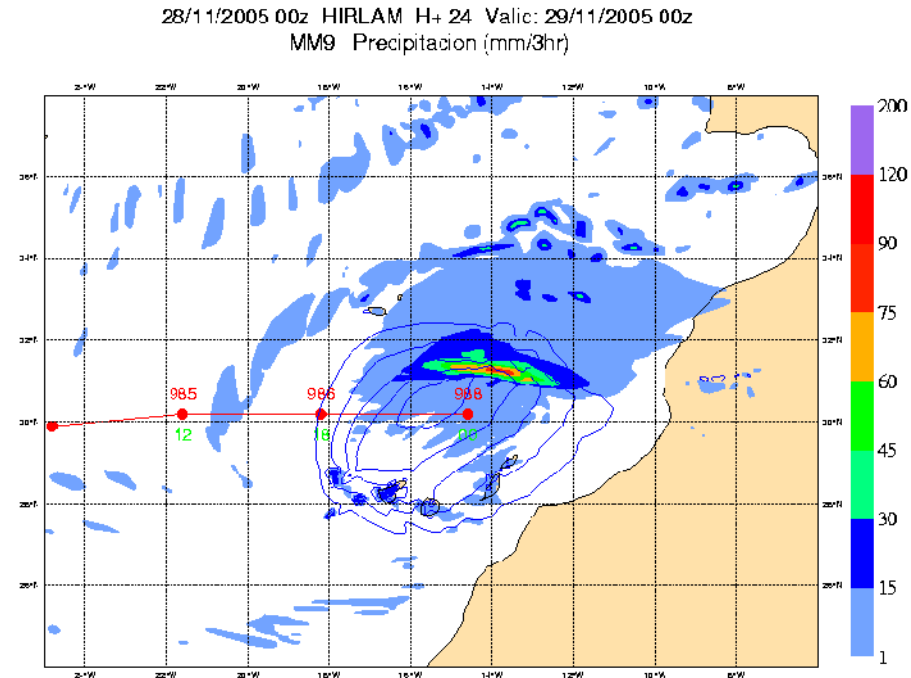

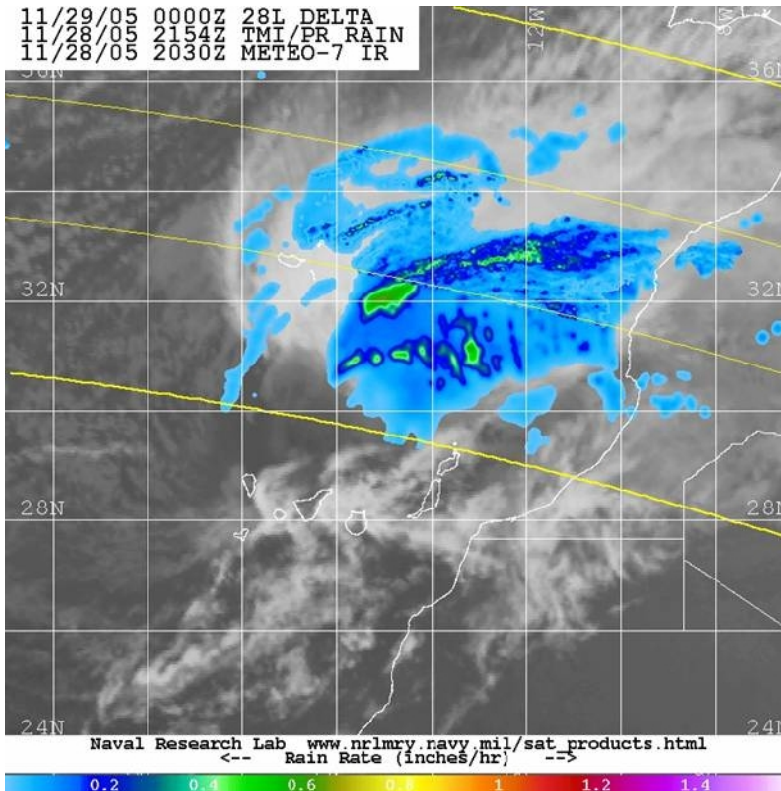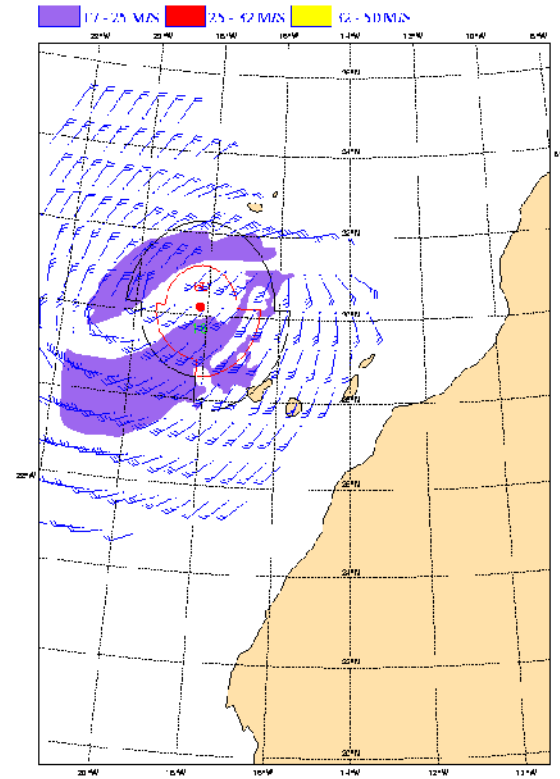DELTA TRAYECTORIAS PREVISTAS/OBSERVADA
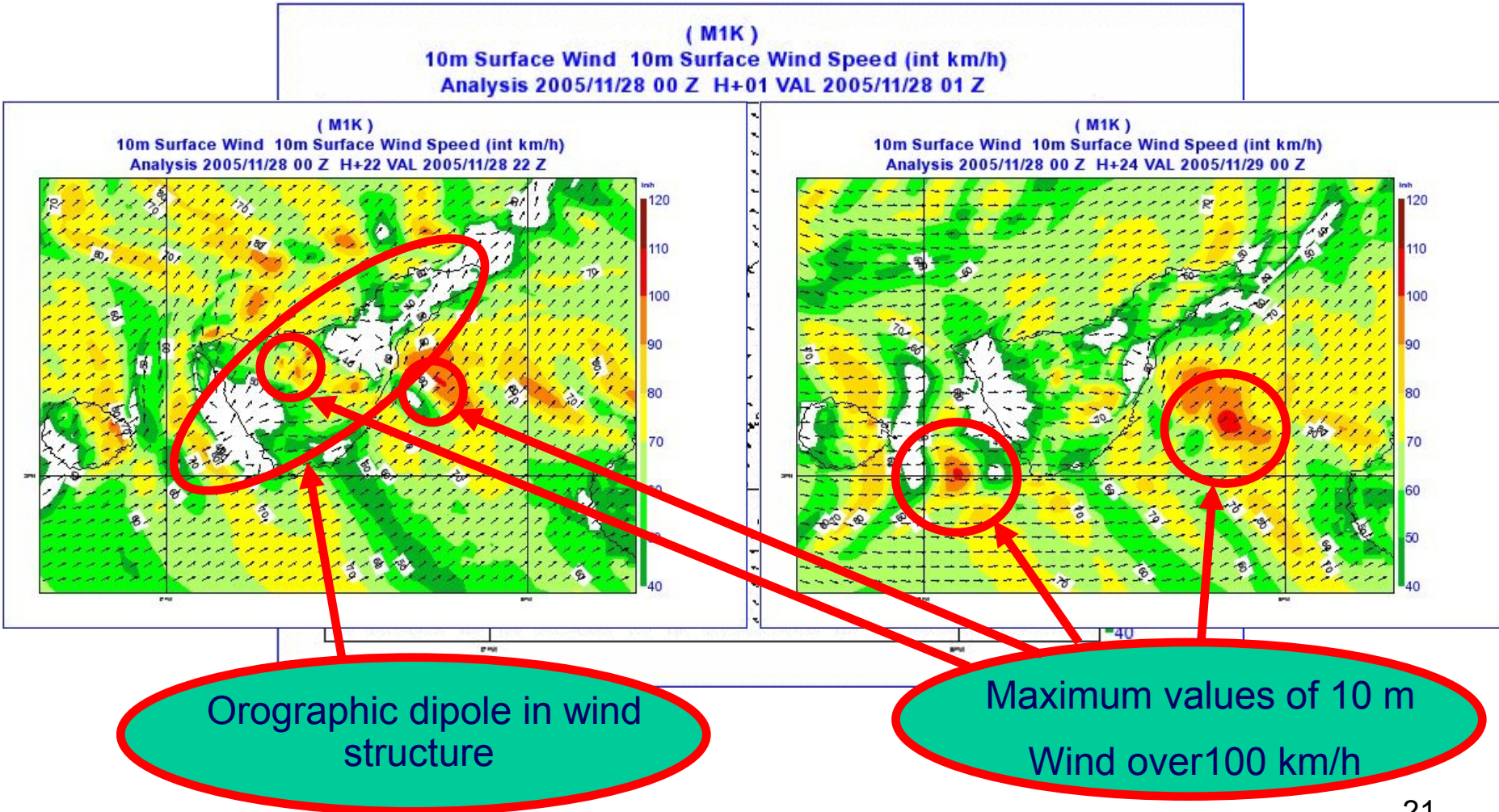
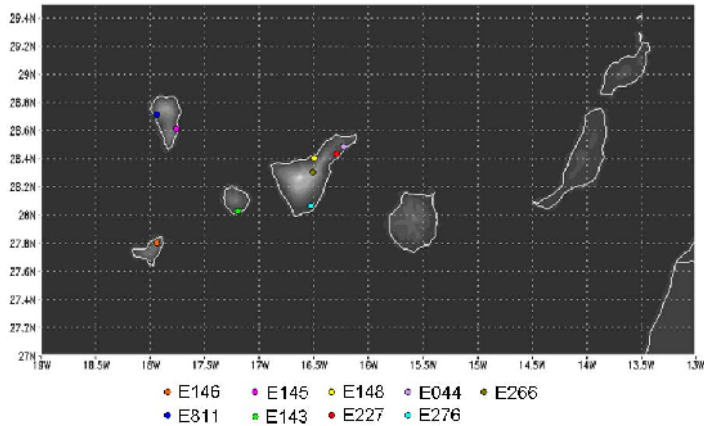- Intensity

Pressure   Max Surface Wind

• Precipitation

- Wind
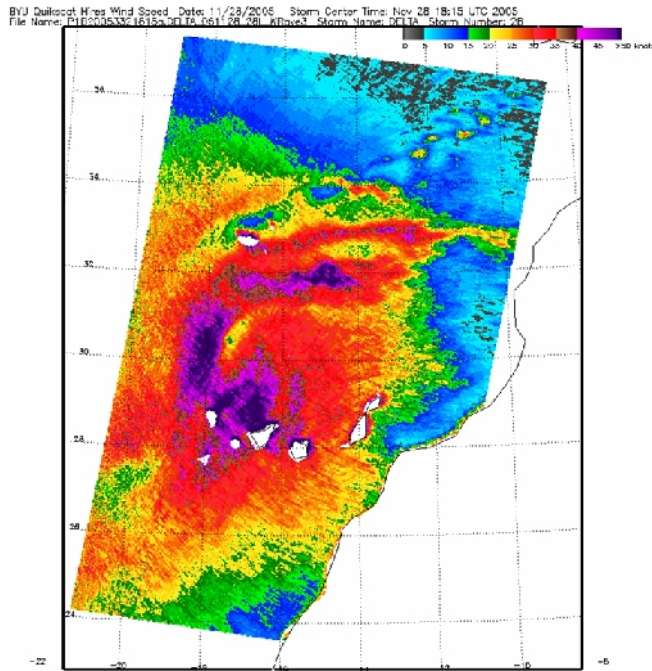
- Wind

Orographic dipole in wind structure

Maximum values of 10 m

Wind over100 km/h

- Wind verification

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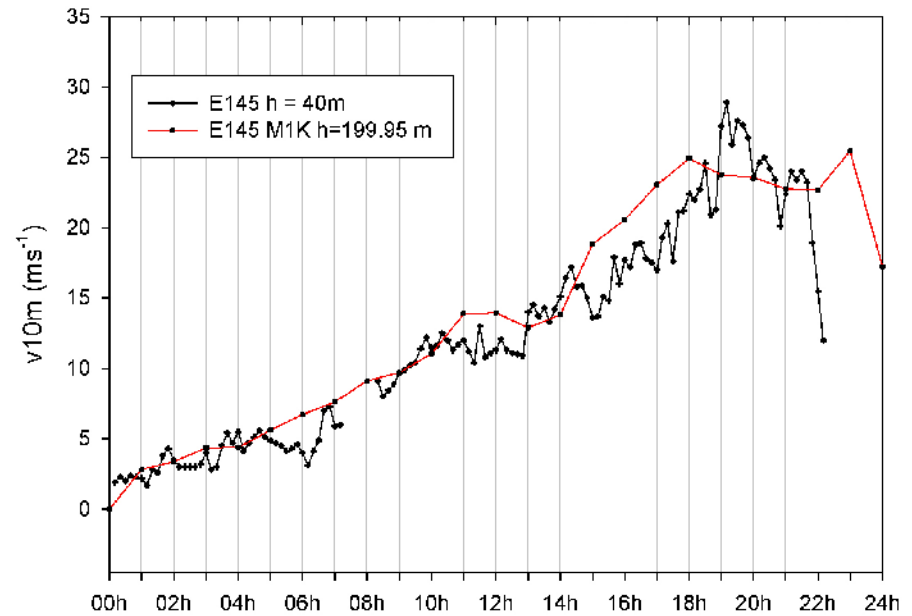
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- MM5 performs as well as other model and IC/BC´s combination of INM-SREPS.

- Bigger computational resources are being used for MM5 integrations due to MM5 eulerian dynamics.

- WPS, WRF-ARW and WRF-NMM has been implemented for Cray X1E and some integration tests has been done.

- WRF is faster than MM5 but almost one month of integrations of WRF-ARW and WRF-NMM must be done with GFS data to check the

  performances of both models against MM5.

- WRF would substitute MM5 at INM-SREPS.

- Some adaptations will be done to use different global models IC/BCs

Obrigado
Gracias
Thank you