OPERATIONAL MODELLING ATMOSPHERIC CHAINS at LaMMA

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Contents

Since 2007

-> WRF (different cores and resolution)

Beginning from March 2017

-> Scientific Collaboration with CNR-ISAC to run BOLAM & MOLOCH

2. Computing Resources

Nodes 5-6-7

STORAGE
10 Tb

InfiniBand
FDR (56 Gb/s)

Switch 1Gb

Postprocessing

2 x 18 cores Intel(R) Xeon(R) CPU E5-2699 v3 @ 2.30GHz
RAM : 64GB
HARD DISK local : RAID1 1TB
Consumption TDP: 145W

8 cores AMD CPU 6380 @ 2.50GHz
RAM : 6GB

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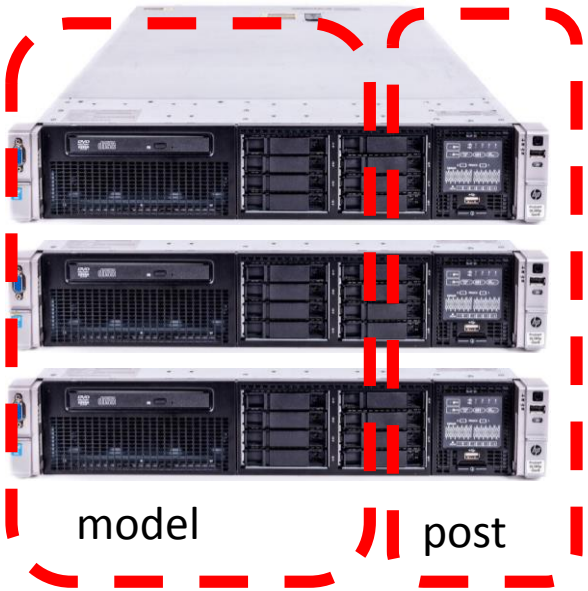
NODES 5-6-7

TOTAL = 3x36 = **108** processors



WRF: **106** processors
MOLOCH: **96** processors
BOLAM: **96** processors

Realtime Polling
(transfer grib)

InfiniBand

8 processors

Postprocessing

Make GRADS Maps
Services

Multitask
8 processes running in
parallel

Realtime visualisation
On intranet

Grib and Maps
Ready as soon as
They are produced
(2-3 minutes delay)

2 processor dedicated to real-time
postprocessing (nc-> grb or mhf->grb2)

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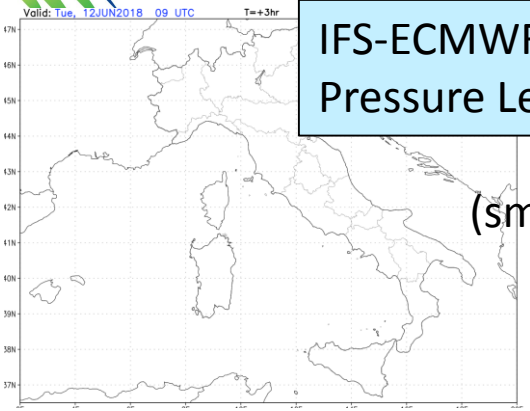
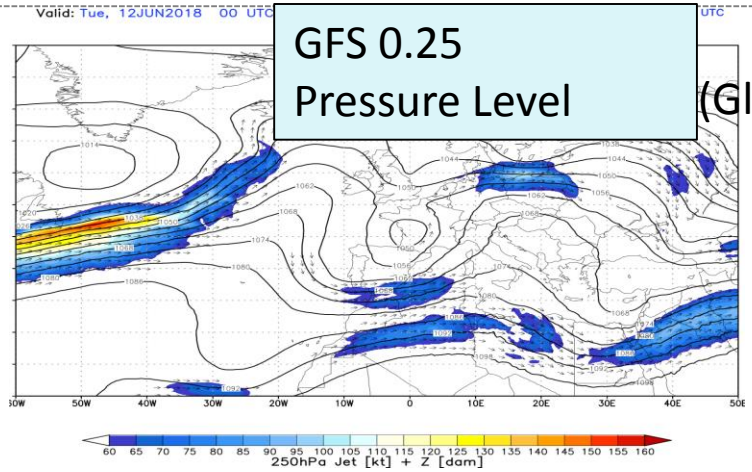


IFS-ECMWF 0.125
Pressure Level

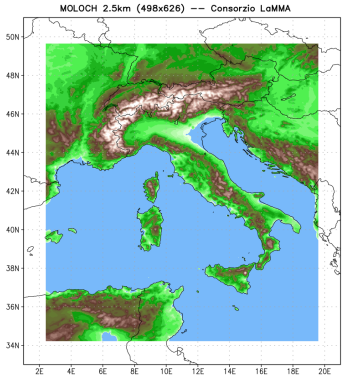
(small area)



GFS 0.25
Pressure Level

(Global)

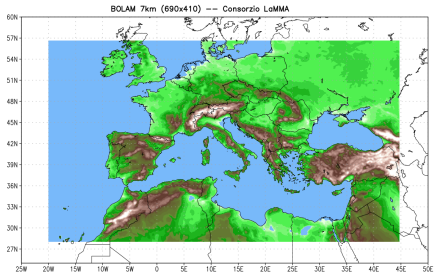
DIRECT NESTING



00, 06, 12, 18 UTC

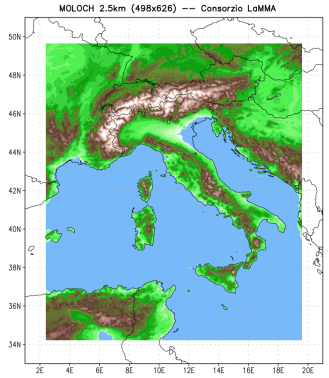
MOLOCH 2.5km
WRF 3km

DIRECT NESTING



00, 12 UTC

BOLAM 8km
WRF 12km



00, 06, 12, 18 UTC

MOLOCH 2.5km
WRF 3km

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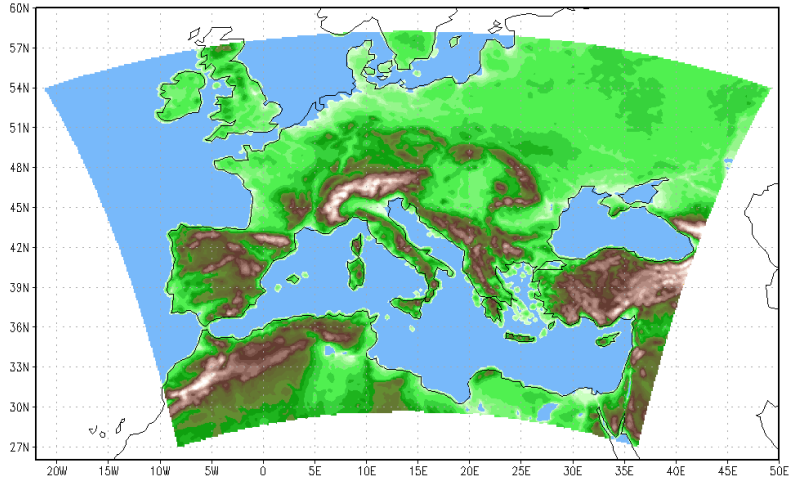


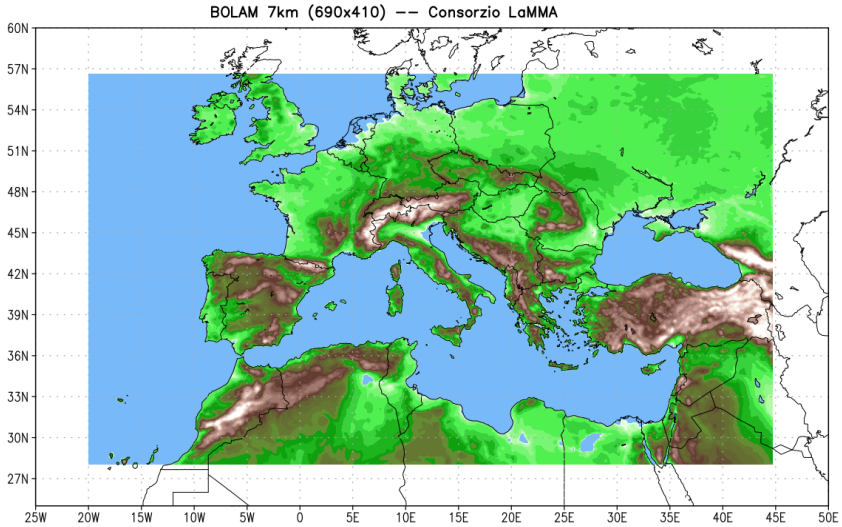
WRF 0p12 (12km)
Cumulus

380x270x50

Dtstep = 72 s
Radiation = 24 min

NP = 106

Time/24h = **4 min**



BOLAM 0p07 (8km)
Cumulus

690x410x50

Dtstep = 60 s
Radiation = 18 min

NP = 96

Time/24h = **5 min**

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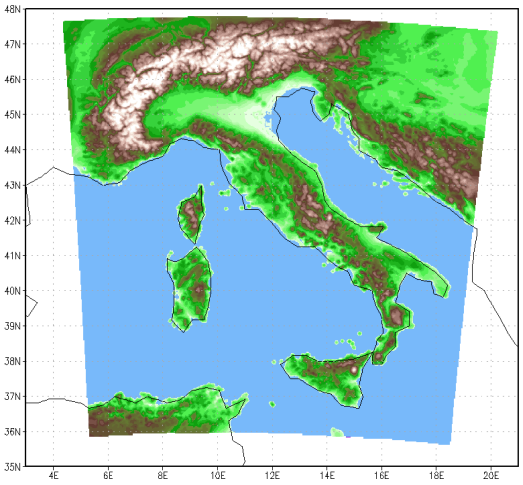


WRF 0p03 (3km)

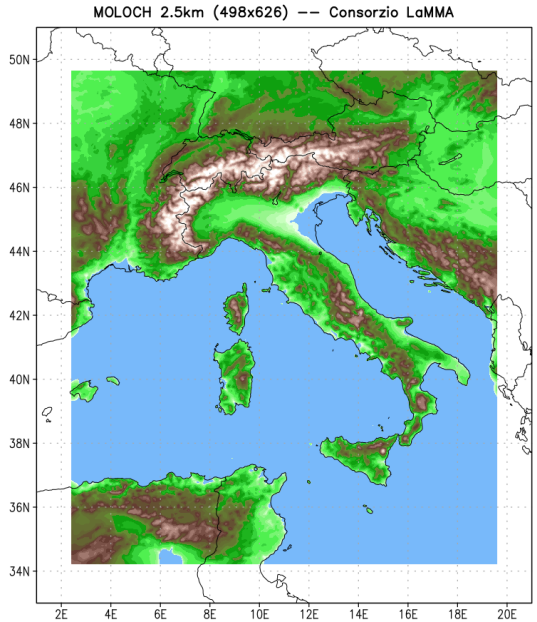
400x440x50

Dtstep = 20 s
Radiation = 6 min

NP = 106

Time/24h = **44 min**

No Cumulus



MOLOCH 0p02 (2.5 km)

498x626x50

Dtstep = 22.5 s
Radiation = 18 min

NP = 96

Time/24h = **17 min**

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Future Plans

1. Convection Permitting Ensemble
2. Very High Resolution (1 km or less)
3. Data Assimilation (see Rovai)

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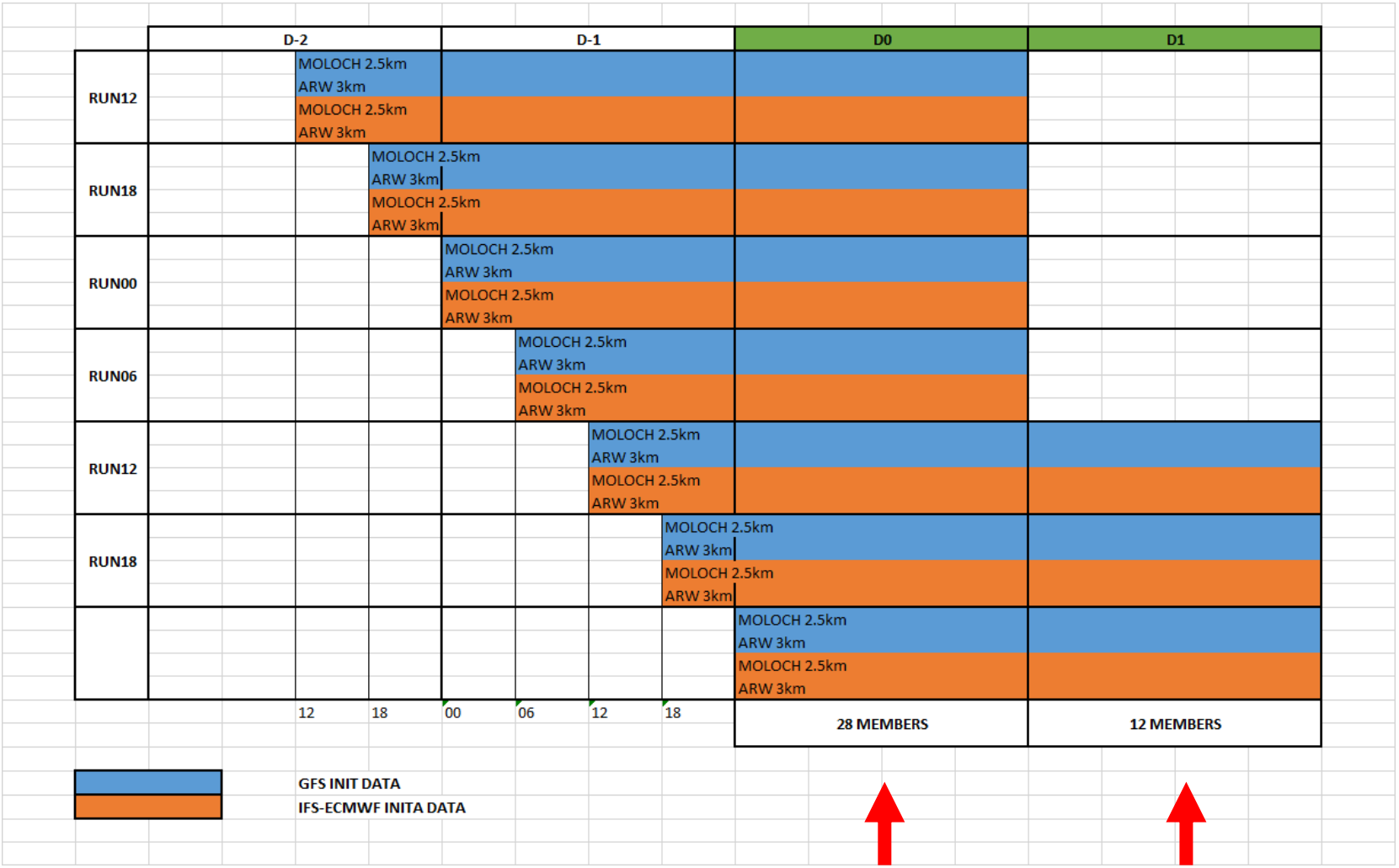
Multi Model – Multi Lagged HR Ensemble



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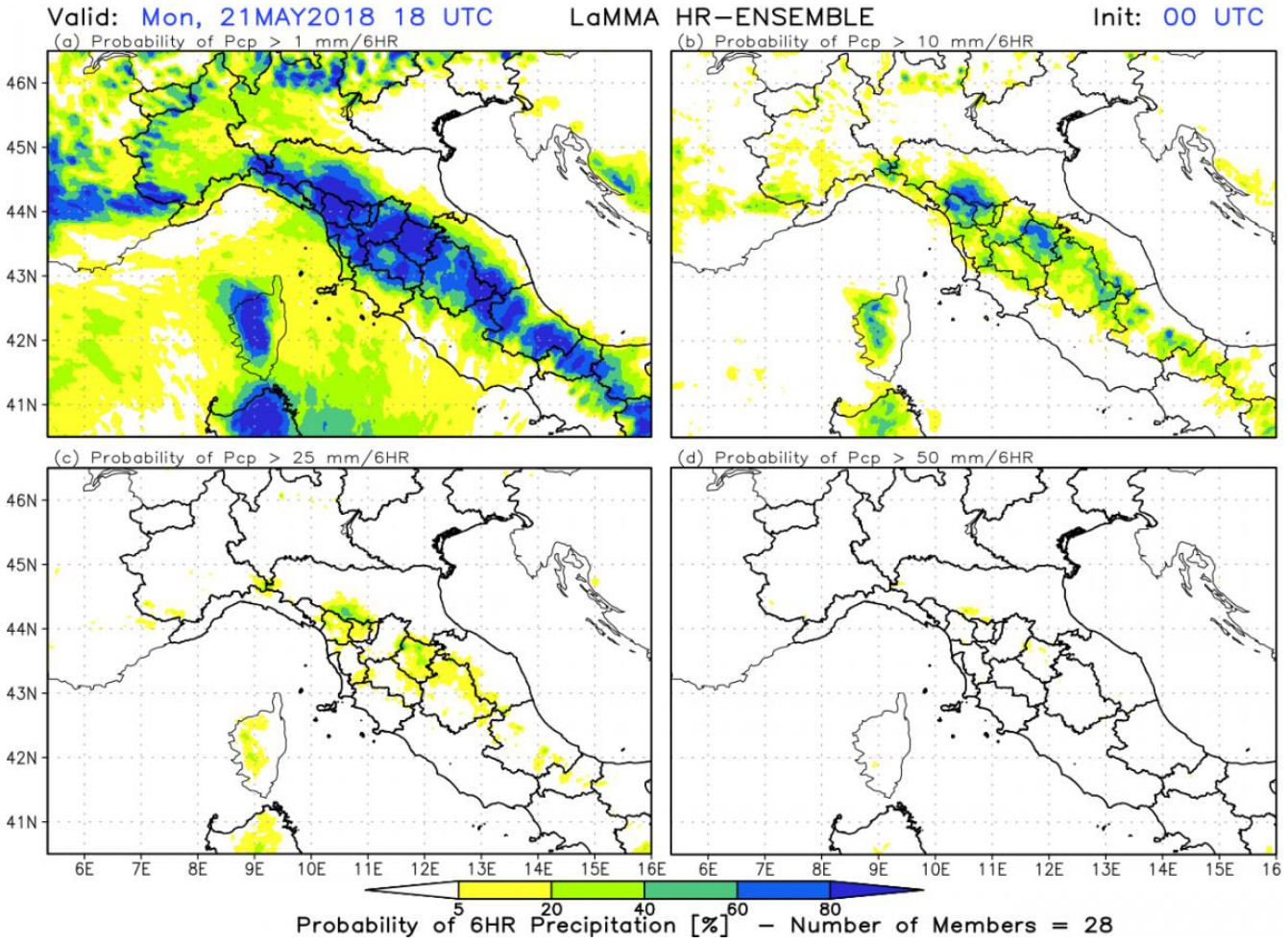
Multi Model – Multi Lagged HR Ensemble



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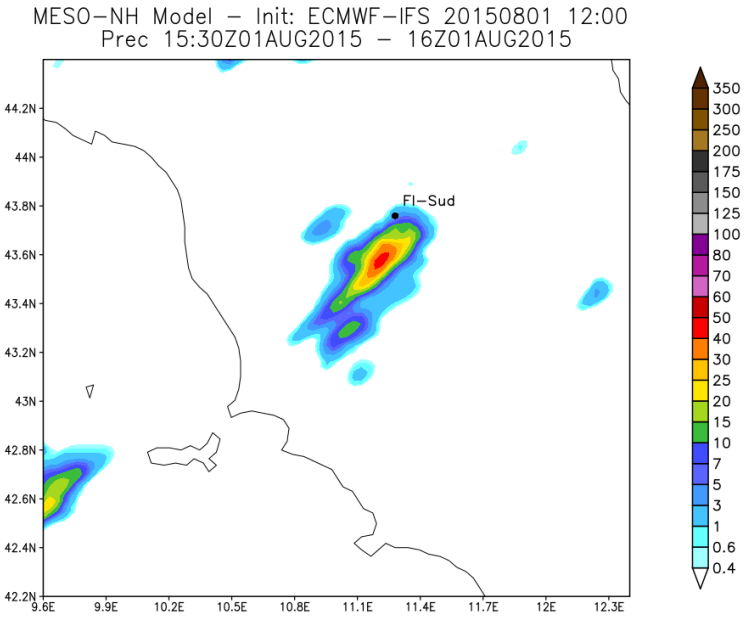
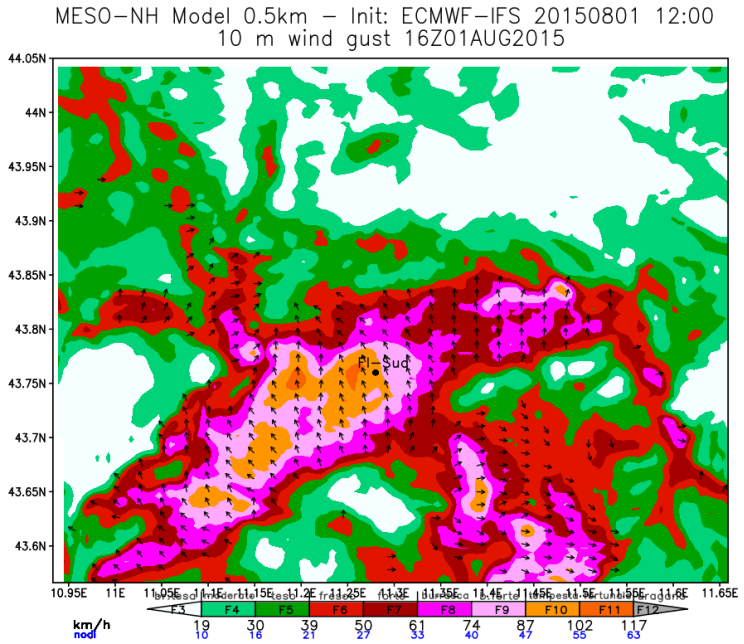
Very High resolution (1km or less)





MESO –NH 500 mm

1 August 2015 – DOWNBURST Case Study