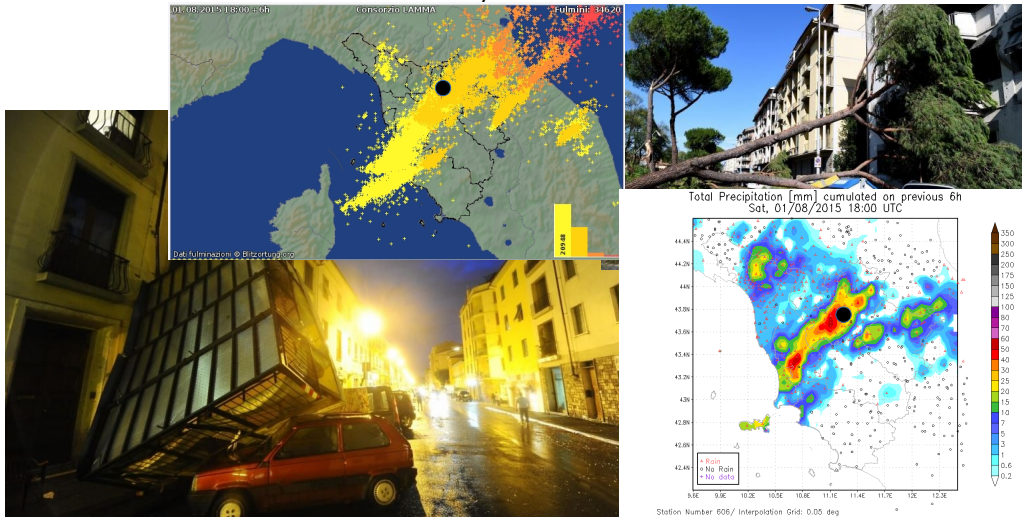


INTRODUCTION

On 1st of August 2015 fast moving multi-cellular storms with trajectory SW-NE caused a strong microburst in Florence.
The downburst caused a casualty, serious damages to structures and the downing of hundreds of historical trees.
The affected area was smaller than 1km square and the event lasted for less than 30 minutes (19:00 – 19:30 LT)
The very dense station network in the area did not observe the event directly, but damages indicates wind-gusts well above 100 km/h
Large hail and intense precipitation (around 50 mm in a 3-hour period) were observed.
This was the second occurrence in few years in the same area.

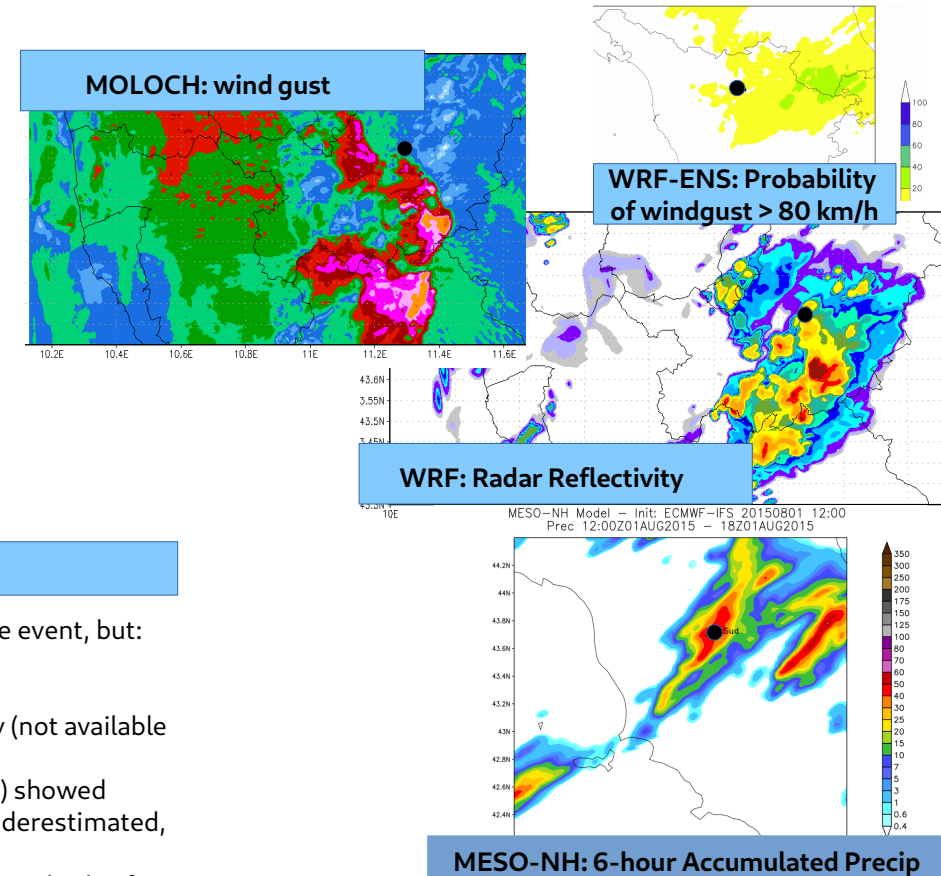


OBJECTIVES

Investigating the **predictability** of severe micro-scale phenomena **with different state-of-the-art NWP models**

METHODOLOGY

Several deterministic very high-resolution simulations (down to 500 meters of grid spacing) have been performed with some numerical models: WRF, MESO-NH, MOLOCH
In addition a high-resolution ensemble approach has been performed in order to investigate the probability of severe weather occurrence



MAIN FINDINGS and CONCLUSIONS

- 1) Very high-resolution deterministic models (500 m grid spacing) were able to simulate the event, but:
 - the intensity is underestimated (e.g forecasted wind gust around 100 km/h)
 - the affected area is displaced and the timing is slightly anticipated.
- 2) Better results are achieved with initial data from the IFS model at 12 UTC of the same day (not available in time for operational warnings), indicating a strong sensitivity to initial conditions
- 3) The high-resolution ensemble approach (which might be useful for operational warnings) showed some interesting indications about storm potential, nevertheless the actual severity is underestimated, possibly due to the coarse resolution (3 km grid spacing)
- 4) To forecast this kind of events it is necessary to move towards resolution of the order of hundreds of meters and temporal outputs of the order of minutes
- 5) Ensemble approach might be very useful provided that the grid spacing is less than 3 km and statistical output postprocessing is performed