COSMO PP CITTA’ Meeting

CIRA Contribution – 07 Jul 22

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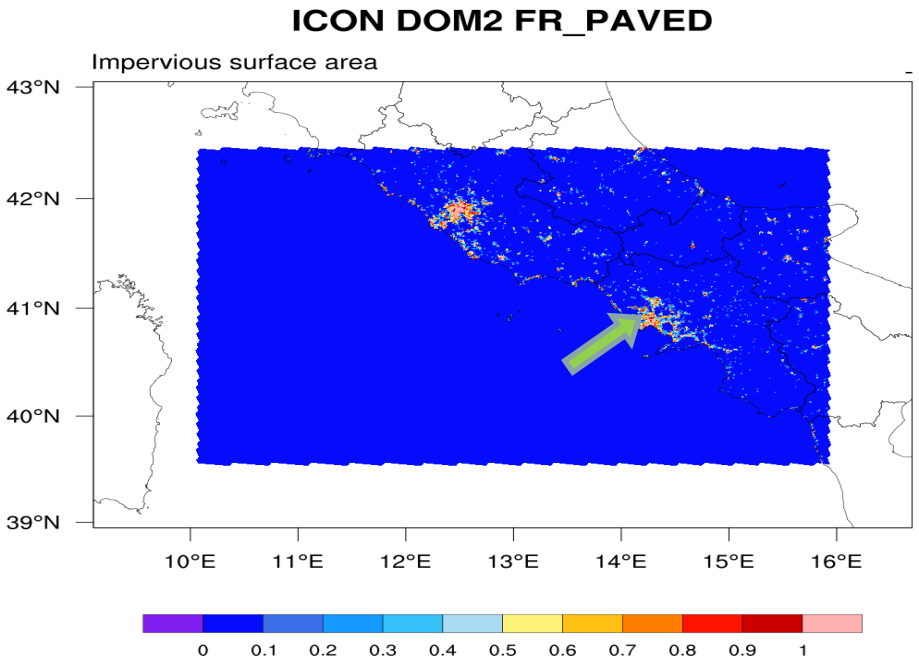
Numerical settings

- Horizontal resolution = ~ 1 Km (R02B11)
- 24 h run in forecast mode:
  - Start date: 2018-11-19
  - IC: IFS Analysis @ 00:00
  - BCs reads @ IFS forecast every 3h
- «DOM2» size:
  - ncells = 110216
  - nedges = 165812
  - nverts = 55597
- Timestep size= 12 s
- lterra_urb = .true. Vs .false.

- Results:
  - ΔT2m(True - False) field on »DOM2» @{1,3,16}hh
  - Local T2m(t) as function of fr_paved ( )
  - Preliminary results on R02B12 - ~ 0,6 Km



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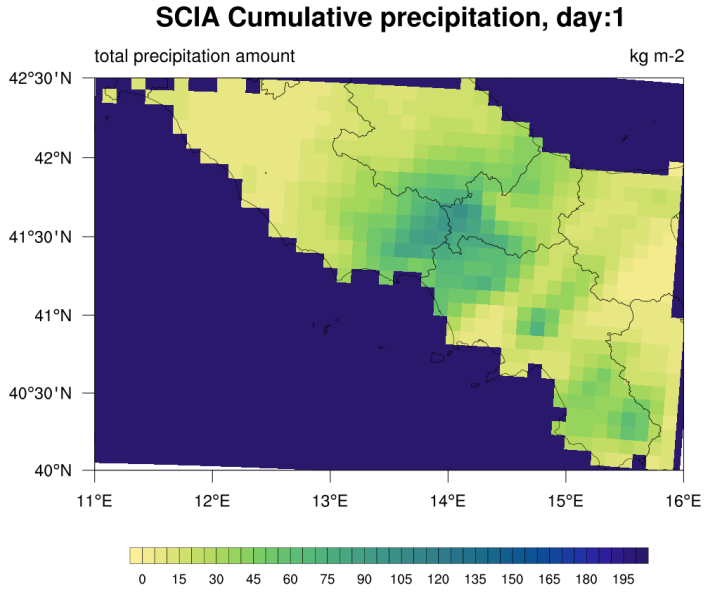
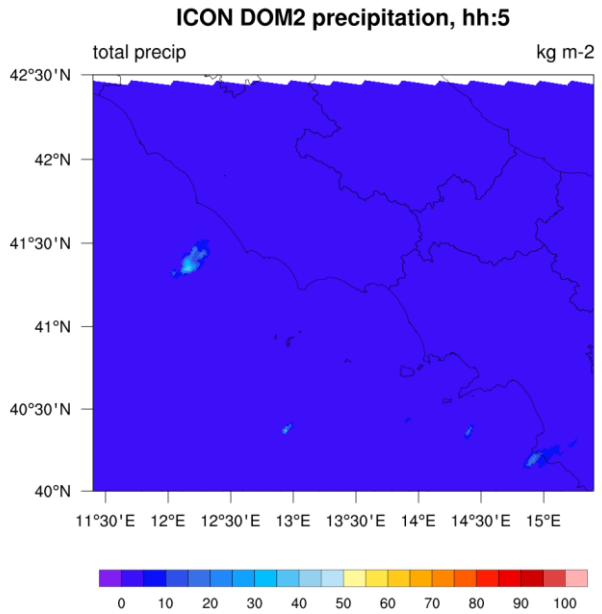
Comments on analyzed day

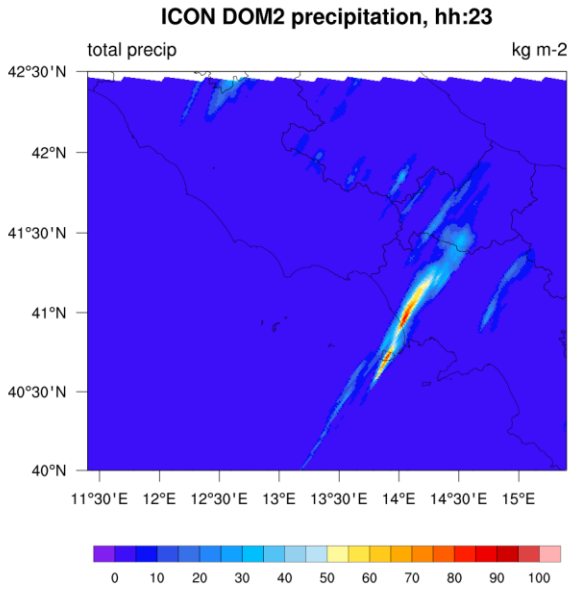
- 19–20 November 2018: a low pressure system coming from Western Mediterranean ran over Sardinia first and then hit the south-central regions of Italy, determining intense storms and gusts. These days were already selected for the calibration of COSMO model.



Cumulated 24h precipitation measured from SCIA



ICON precipitation at 05.00



ICON precipitation at 23.00

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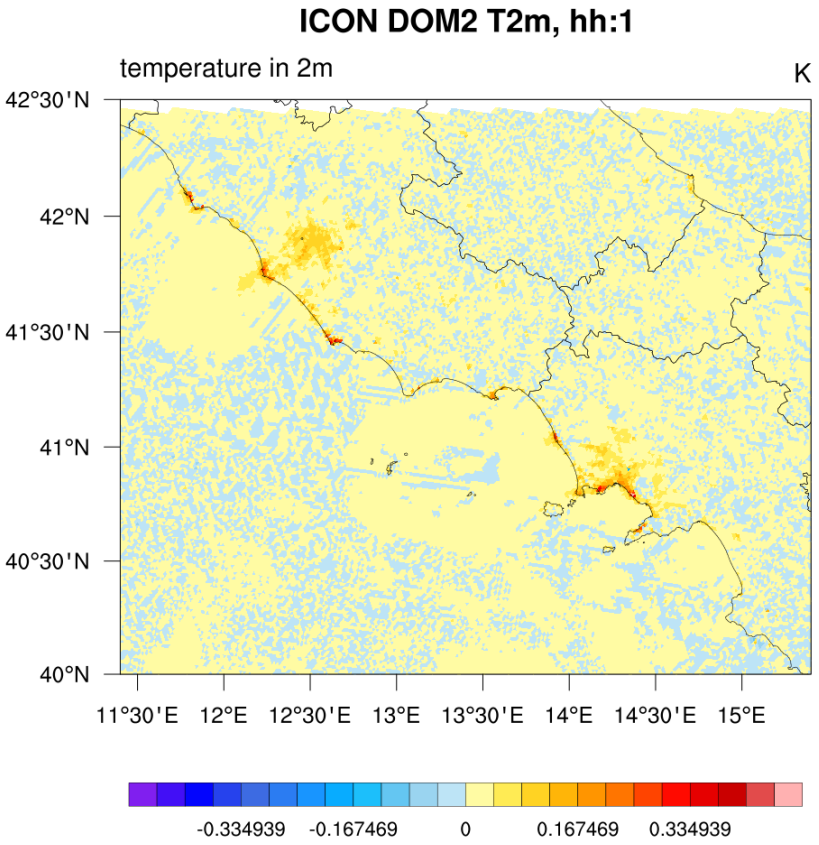
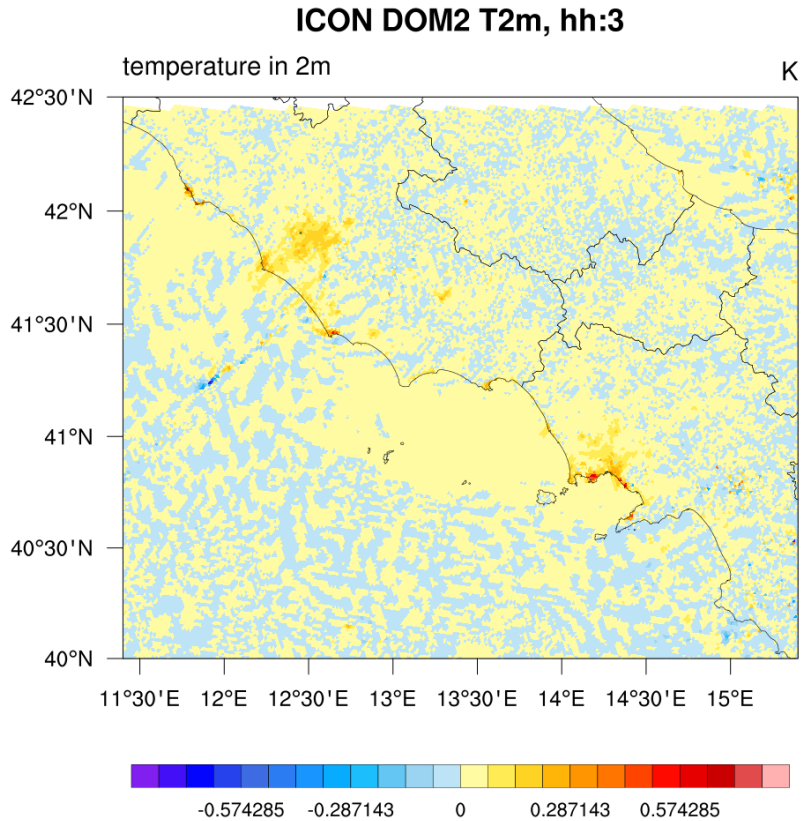
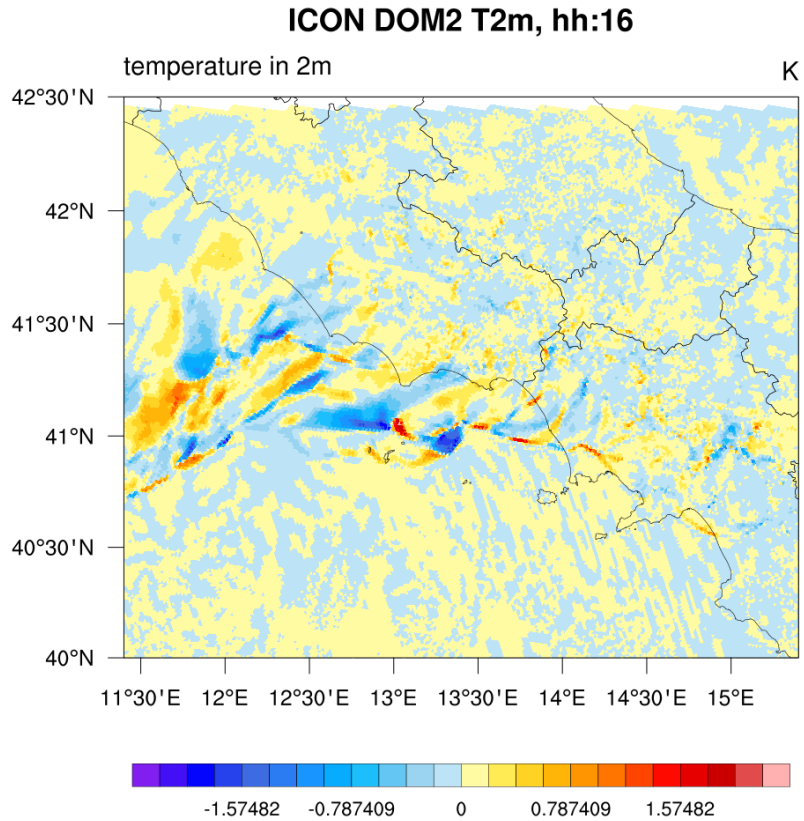
ΔT2m(True - False): map field







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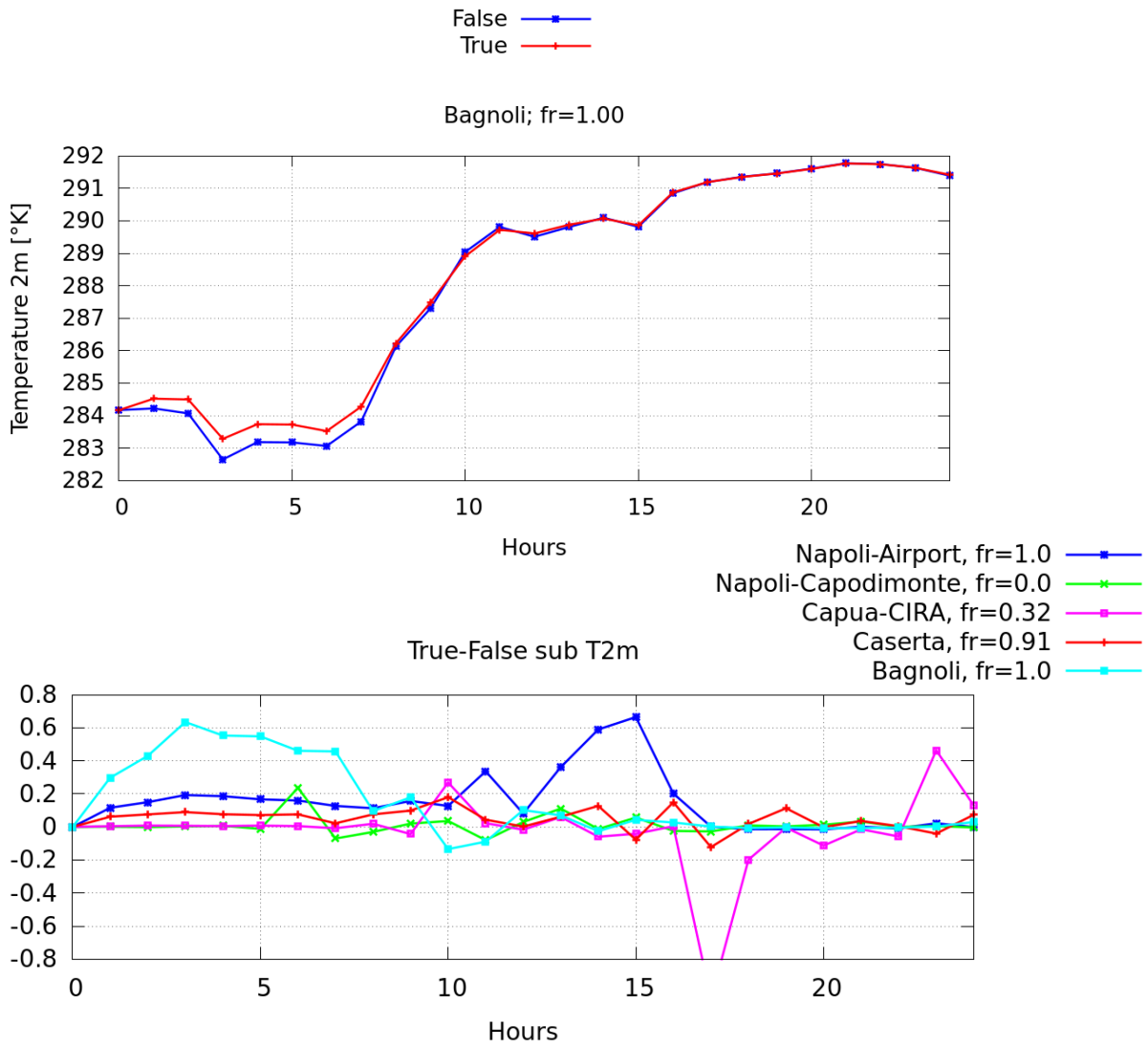
ΔT2m(True - False): local results



- Higher T2m during the nightime
  - Up to +0.6K, influenced by fr_paved
- Numerical instability grows up during morning time starting from sea
  - noise detected during afternoon time (i.e. «Capua», purple line on bottom graph)

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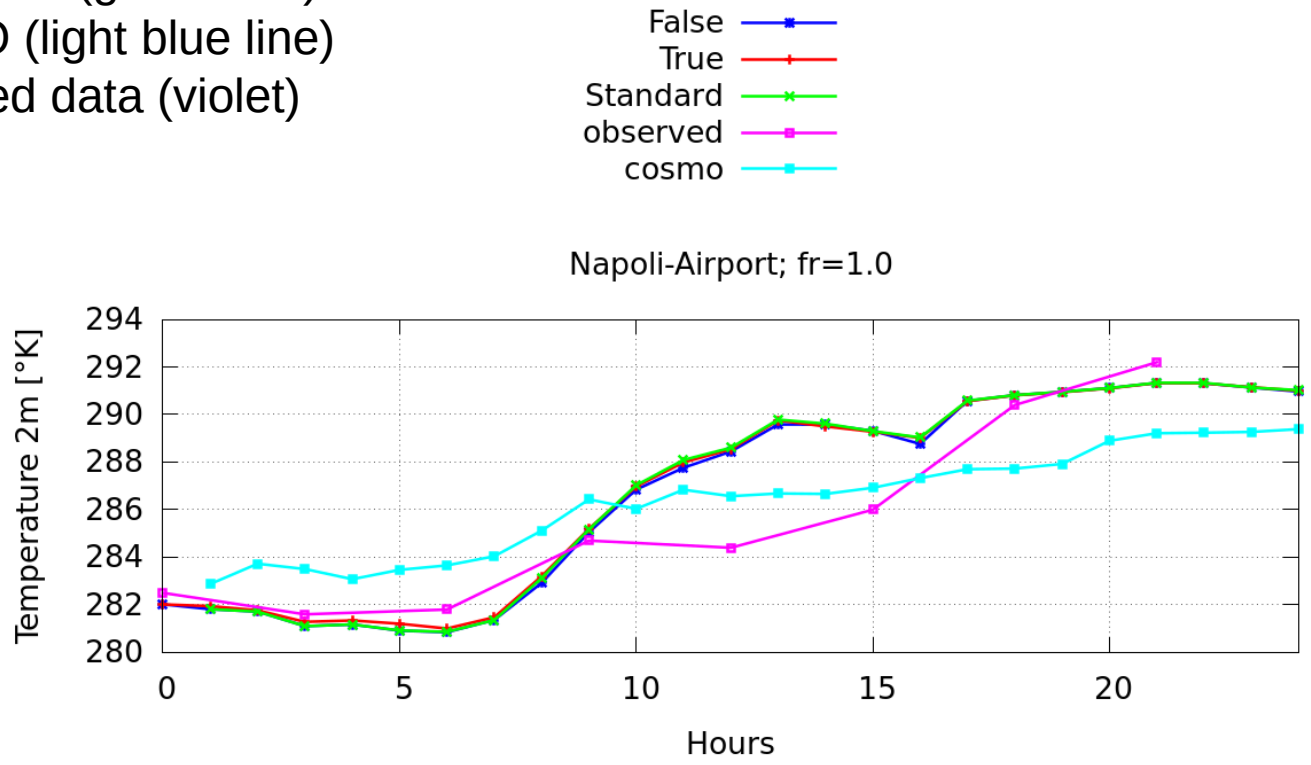
Comparison

- ICON TERRA_URB (T/F) compared with:
  - ICON-LAM (green line)
  - COSMO (light blue line)
  - Observed data (violet)



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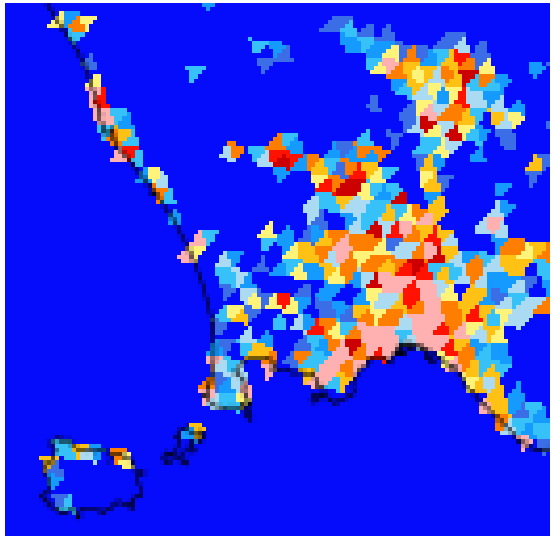
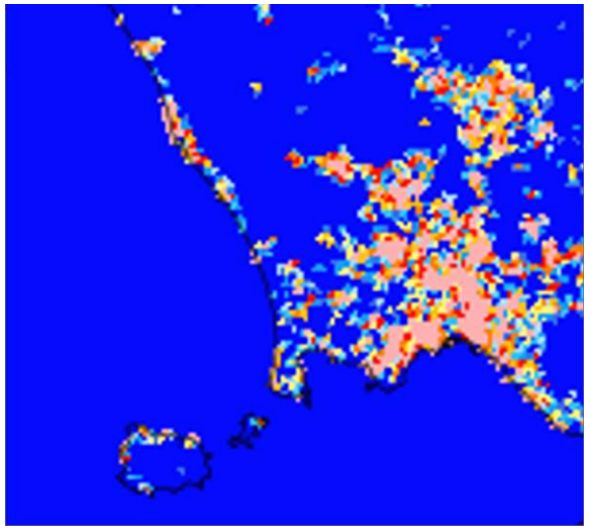
Fine Grid - preliminary

Horizontal resolution = ~ 1,0 Km (R02B11)

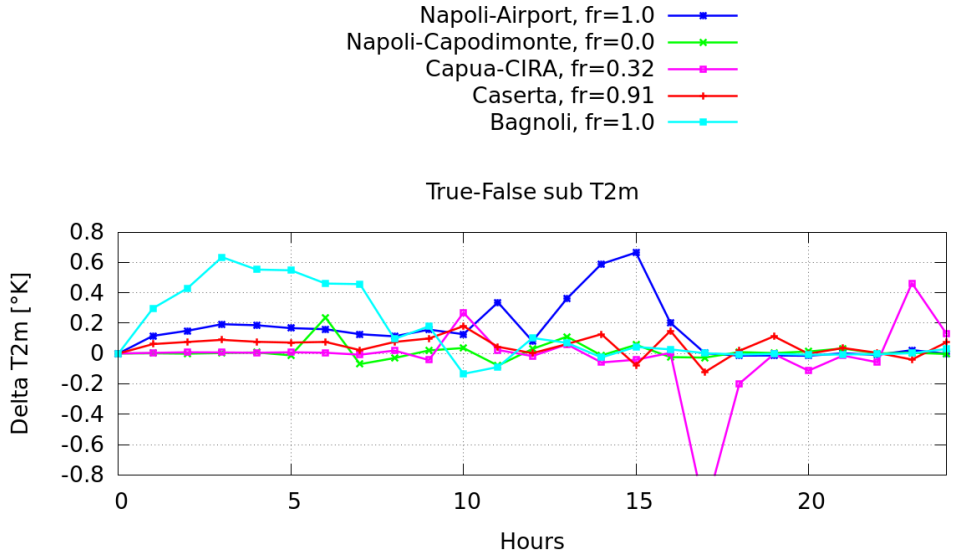


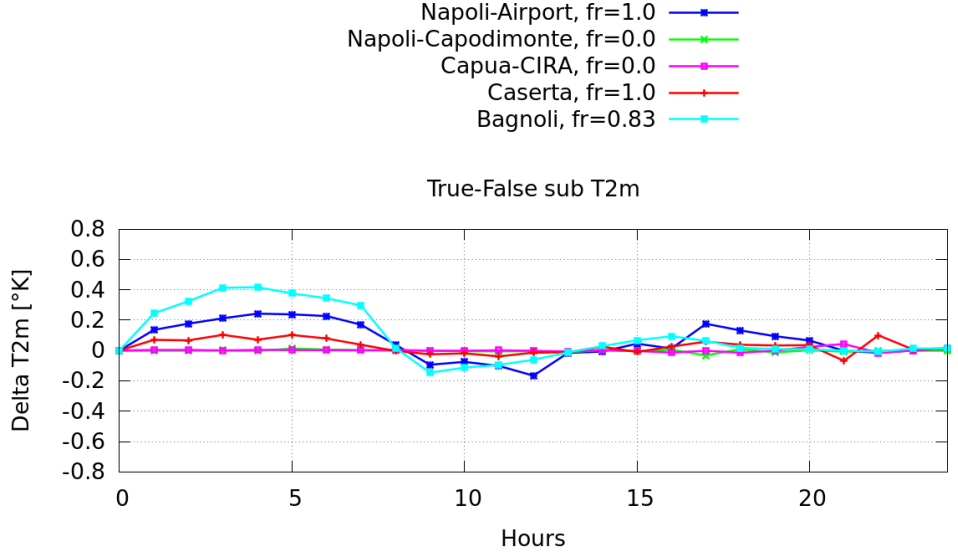
zoomed fr_paved maps at different grid resolutions

Res 600 m



- Horizontal resolution = ~ 0,6 Km (R02B12)
- ncells = 109860; nedges = 165277; nverts = 55418
- dt = 6 s





fr_paved differ locally

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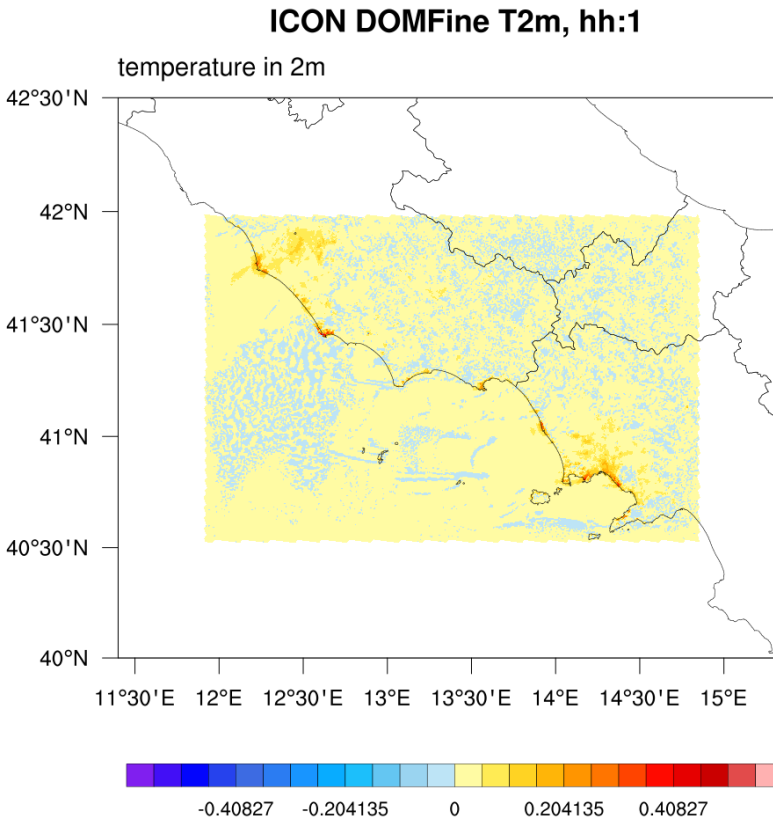
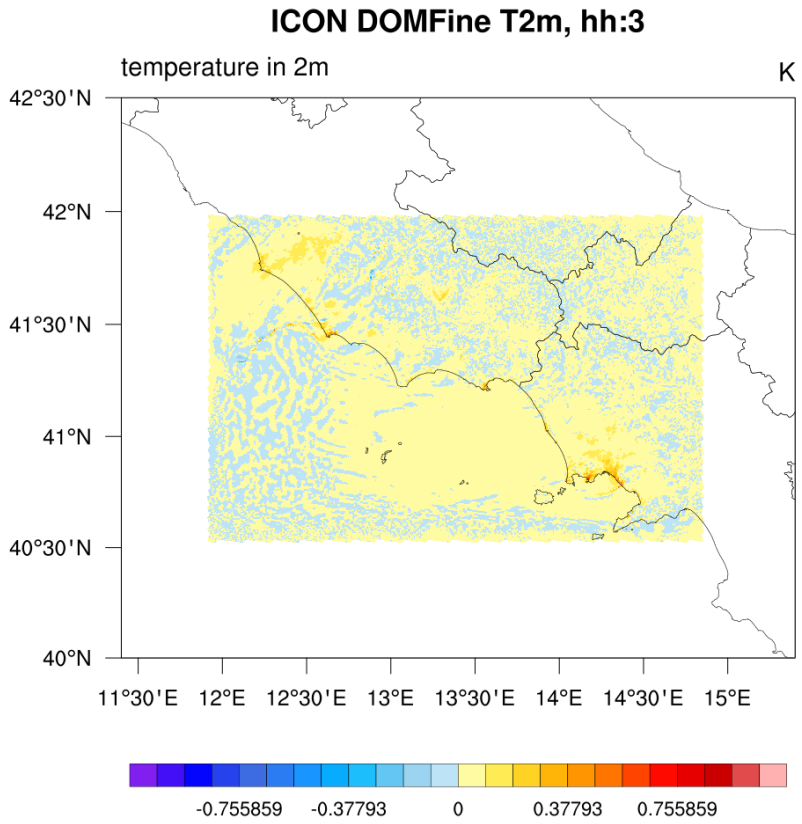
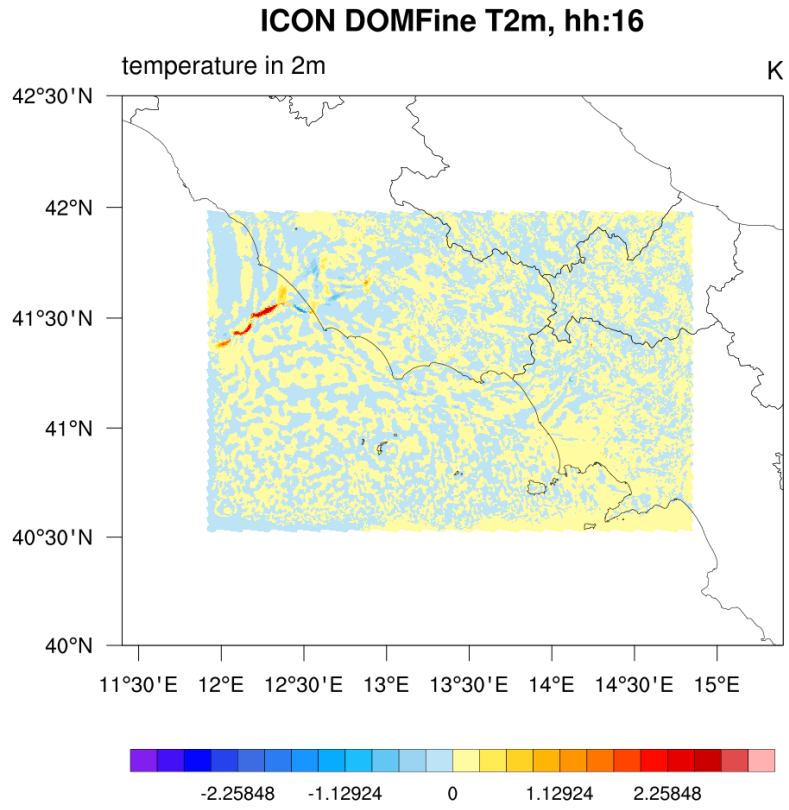
Fine Grid – ΔT2m(True - False): map field







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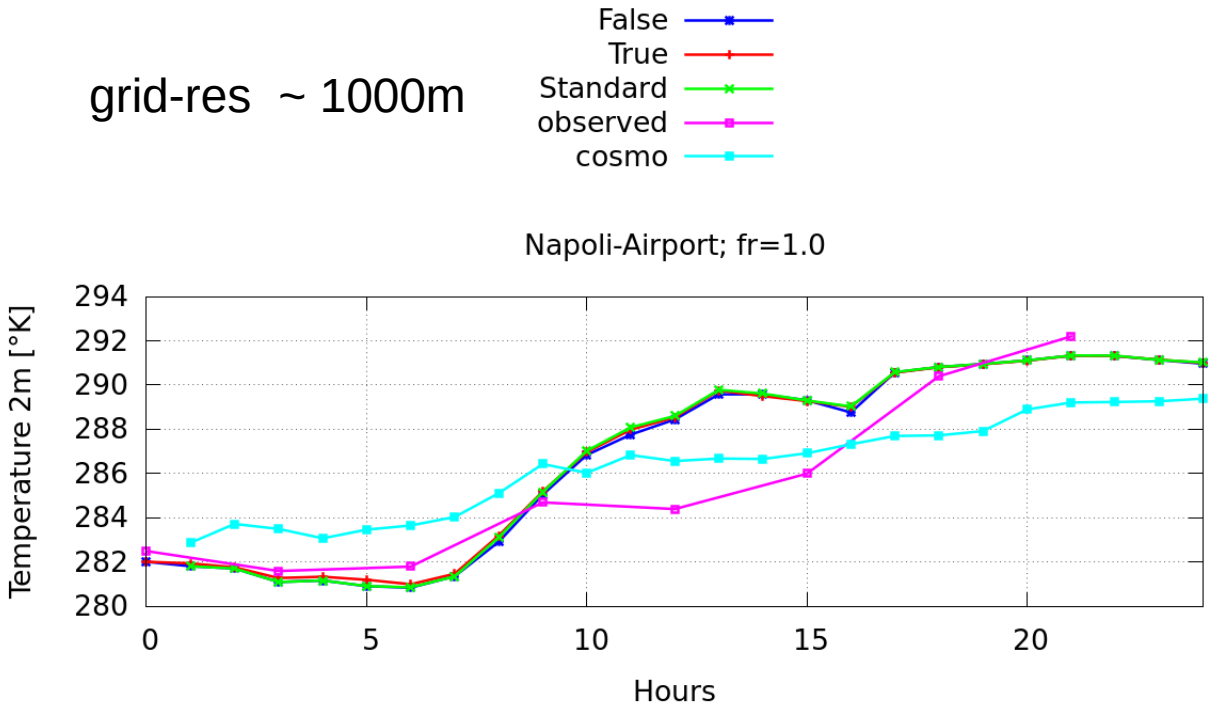
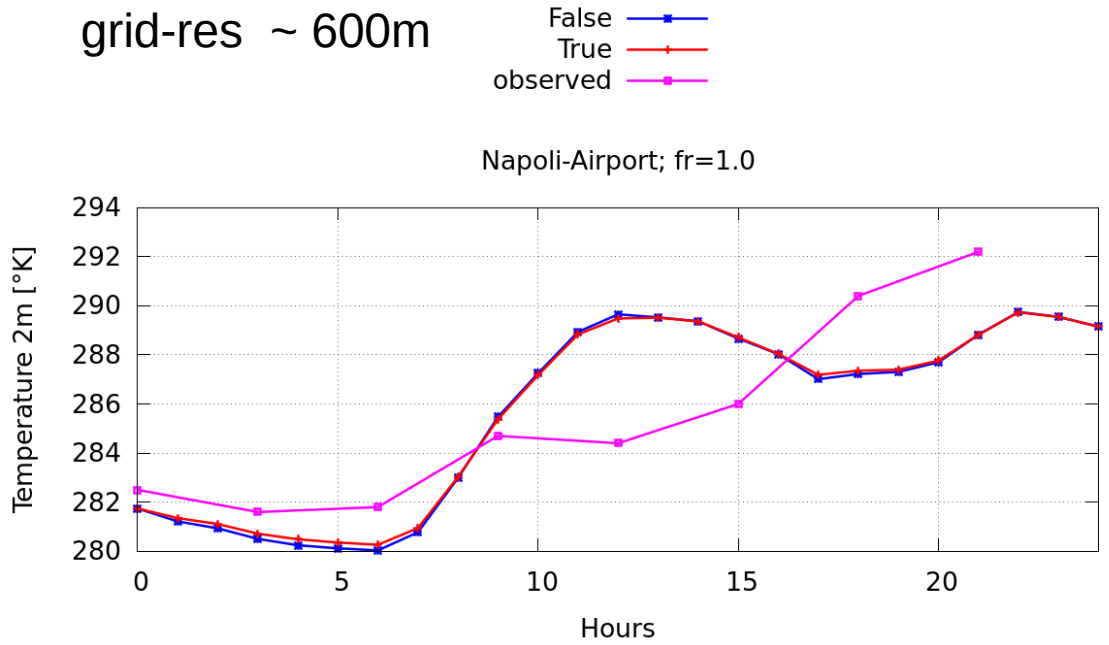
Fine Grid – ΔT2m(True - False): local results

- ICON TERRA_URB compared with:
  - ICON-LAM (green line)
  - COSMO (light blue line)
  - Observed data (magenta)

grid-res ~ 1000m



grid-res ~ 600m



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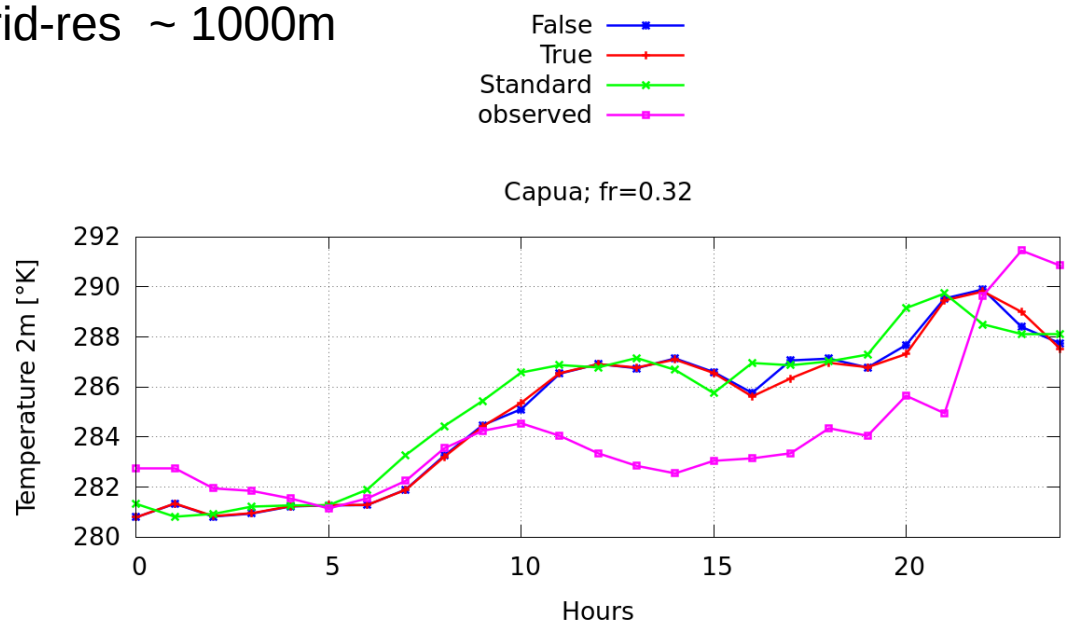
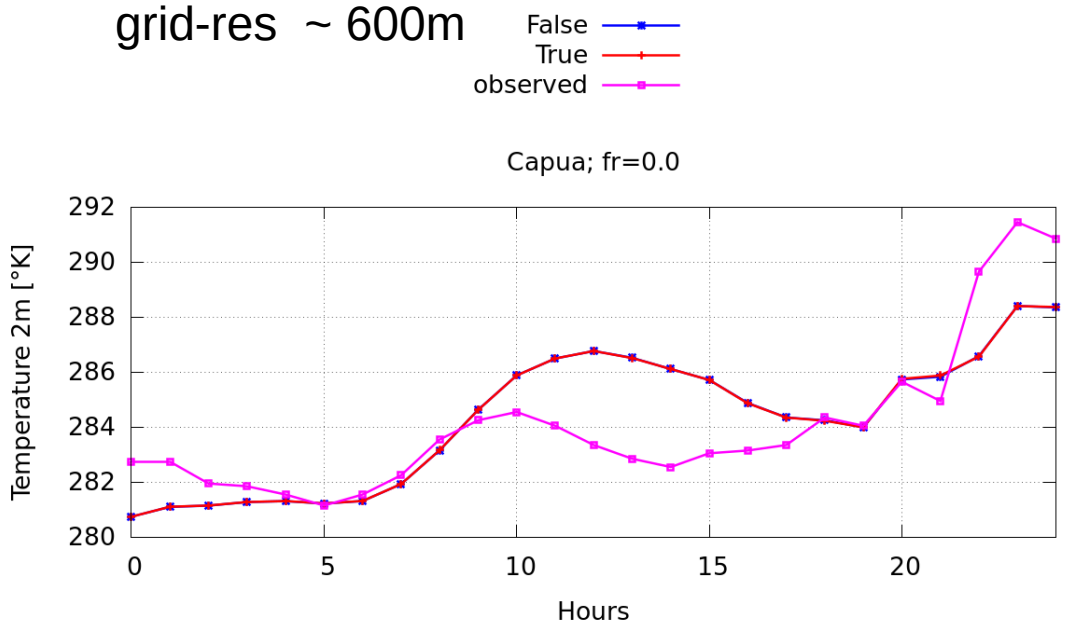
Fine Grid – ΔT2m(True - False): local results

- ICON TERRA_URB compared with:
  - ICON NWP (green line)
  - Observed data (CIRA visibilimeter, magenta)

grid-res ~ 1000m



grid-res ~ 600m



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Comments and way forward

- Preliminary analisys with ICON –Terra_urb performed
  - Only 1-day considered
  - Numerical noise is evident on short run
  - A first test with grid resolution of 600mt
- Next steps:
  - Longer simulations
  - Further statistics based on wider area rural/urban
  - Verify the new uploaded terra_urb release

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