

# Activities in Task 1 of PP CITTA

ICCARUS March 2022

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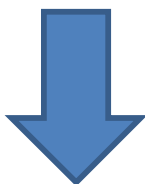
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## Task 1: Implementation of urban scheme (TERRA-URB) in ICON

### OBJECTIVES

1. Porting of TERRA\_URB from the COSMO to the ICON model



**Assumption of landuse classification GlobCover and hardcoded global constants for testing the functionality of TERRA\_URB in ICON !!!**

2. Implement new urban canopy parameter fields from EXTPAR in ICON together with a new land use classification (ECOCLIMAP-SG)



Priority Projects | Introduction | Annual Tasks | Meetings | Home

### CITTA': City Induced Temperature change Through A'dvanced modelling

Project leader: Jan-Peter Schulz (DWD)

0. Project resources | 1. Summary | 2. Background and motivation | 3. Description of individual tasks | 4. Risks | 5. Participants | 6. References | 7. Appendix: Task table

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#### 0. Project resources

Revision:	4, 8 Jun. 2021
Project duration:	Jul. 2021-Aug. 2024
total FTEs request:	9.500 (COSMO) + 1.60 (PoliTO, VITO, KIT) Jul. 2021-Aug. 2024

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### METHODOLOGY

RESEARCH OF INVOLVED FIELDS IN TERRA-URB:

- fr\_paved
- urb\_isa
- urb\_ai
- urb\_alb\_rad
- ...

ROUTINES IN ICON 2.6.4:

- sfc\_terra.f90
- mo\_radiation.f90
- turb\_diffusion.f90
- turb\_data.f90
- ...

ALLOCATION, DECLARATION AND INITIALIZATION OF VARIABLES

COMPILING AND TESTING

Porting of TERRA-URB parameterization from COSMO to ICON-LAM par for par



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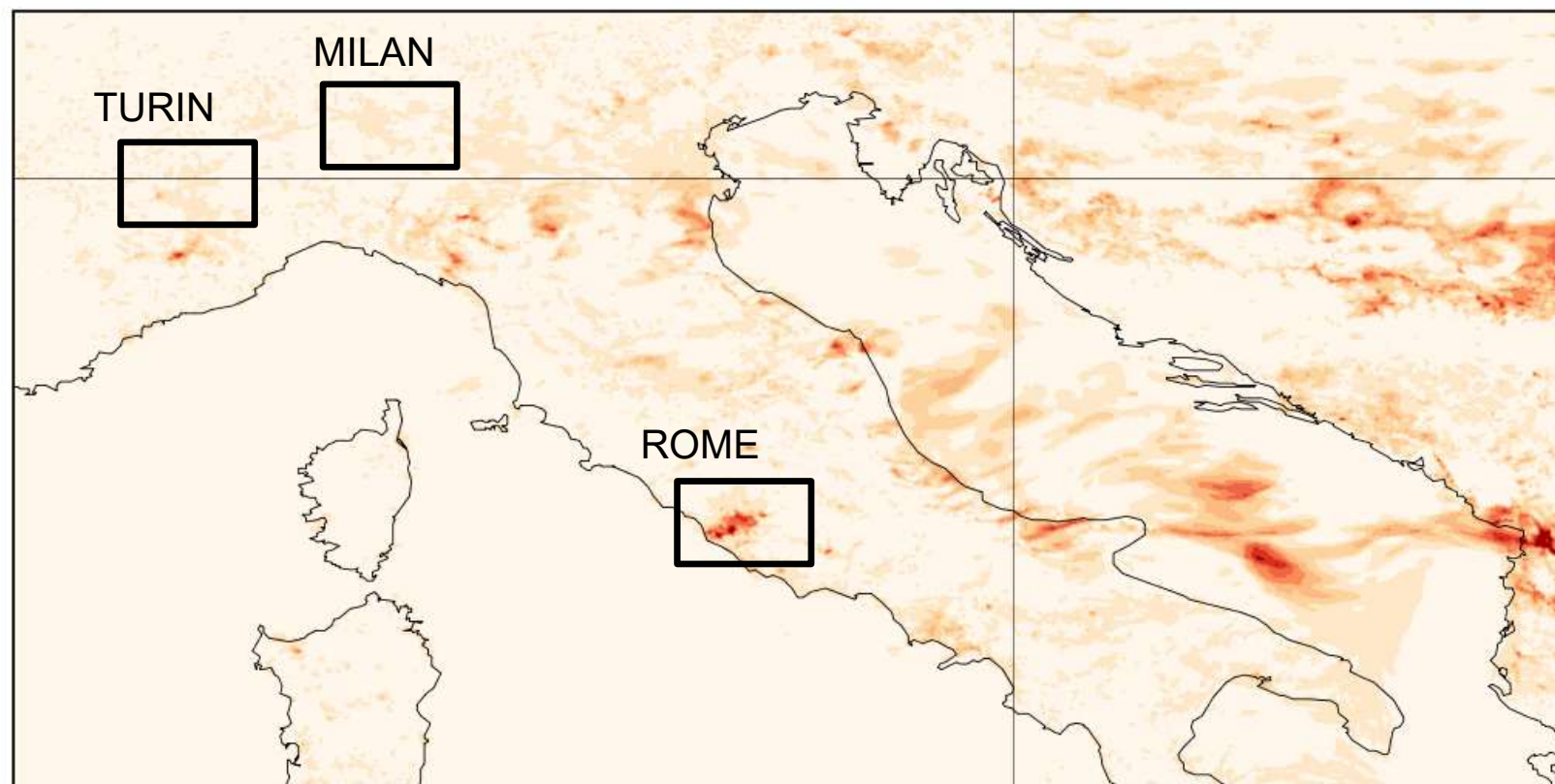
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PRELIMINARY  
RESULTS

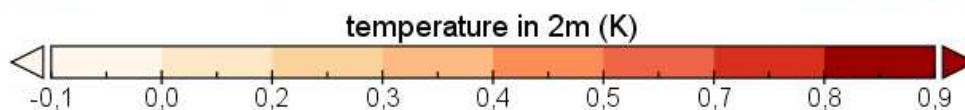
Implemented routine: `sfc_terra.f90`

Namelist switch: `lterra_urb= TRUE | FALSE`



DIFFERENCE  
OF  
SIMULATIONS  
WITH  
TERRA-URB ON  
VS TERRA-URB  
OFF

2M  
TEMPERATURE  
**NIGHTTIME** | 17  
SEPTEMBER  
2021

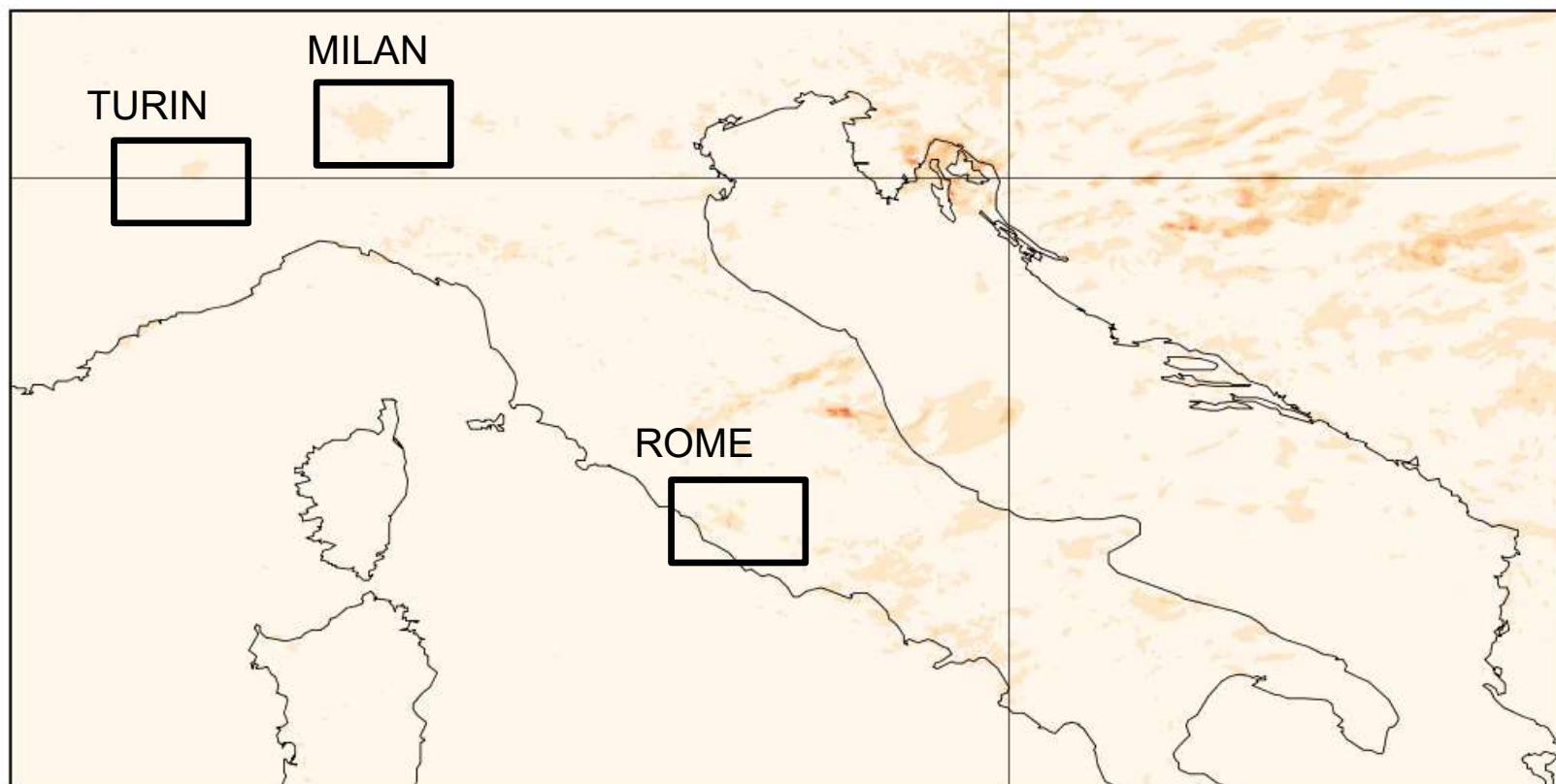


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PRELIMINARY  
RESULTS

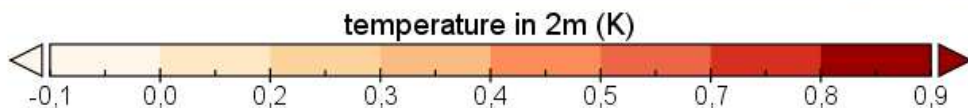
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DIFFERENCE  
OF  
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WITH  
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2M  
TEMPERATURE  
**DAYTIME** | 17  
SEPTEMBER  
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### REMARKS

The preliminary results show that slight differences in 2m temperature (less than 1°C) occur around urban areas that are more pronounced in nighttime than daytime. Some unexpected increases of temperature also appear over the Adriatic sea and coast.

### FUTURE DEVELOPMENTS

- Deep investigations would be performed in order to understand if some unexpected increases have advective nature or could be explained as stochastic occurrence.
- Next steps to complete the porting would be addressed through the modification of turbulence schemes and radiative routines accounting from urban effects.

