The Urban Intercomparison project (UIP)

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Overview of different urban parametrizations within the CLM-community

Name	TEB alongside TERRA_ML	TERRA_MLU	TERRA_ML / BEP
Responsability	Kristina Trusilova	Hendrik Wouters	Sebastian Schubert
Features	inner building temperature snow model, water skin layer roofs/walls/roods, tiled urban fraction	Thermal roughness parameterization, new surface-layer transfer coefficients, anthropogenic heat, impervious water storage, new urban class in TERRA-ML	Street canyon model advanced double-canyon radiation scheme, shadows, radiation trapping, roof/wall/ground fluxes
input		Urban fraction (EEA), annual mean anthropogenic heat (NCAR)	Full 3D cityGML
References	Trusilova et al 2008, Masson 2001	Wouters et al. 2012, De Ridder et al 2012, Flanner 2010, Demuzere et al. 2008, De Ridder, 2006	Schubert et al. 2012, Martilli et al. 2002, Gröger et al. 2008
Aims	Urban climate of Europe and Germany	Urban climate impact on Air-quality simulations over Belgium, urban land-use change scenarios	Urban climate of Berlin and Basel

Different urban parametrizations in COSMO-CLM. Why?

- There is no perfect model...
  - Large vs. Small # of parameters
  - Computational cost vs. Speed
  - Built-in extension vs. External module
  - Variation in particular performance
 - Different approaches have different applications

A great opportunity...

- Urban models of different complexity have been compared in offline mode (Grimmond et al, 2012)

- Do a similar exercise in a coupled version with exactly the same configuration

  - Address the impact of urban-parameterization complexity at the micro-scale (1 – 10km)

  - Address to importance of several urban meteorological features

  - Discover strength and weeknesses of the different parameterizations

  - Provide recommendations on which urban parametrization is suitable for which purposes

Agreements

- Exactly the same model setup and boundary conditions
  - CCLM4.8CLM11, 1km resolution, 2002, Cascade-nested in ERA-INTERIM, 50 vertical layers...
- Decision on model domain was difficult:
  - Basel: **high-quality measurements, including fluxes** →*compare urban model perfomance and relate its impact on the urban meteorological features*
  - Berlin: **bigger city thus more interesting, flat terrain** → *longer runs possible, focus on urban model application, focus on vertical extent of the UHI*

  →3 models will be compared on both sites in parallel
- Shared data storage at DKRZ

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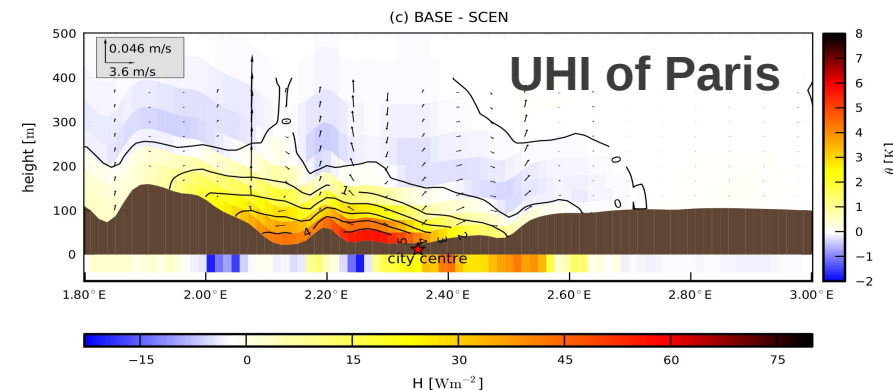
From Wouters et al., 2013 (under review online in ACPD)

Status

- Agreements on: namelists, setup and schedule and model domains

- Boundary conditions → now being prepared

Deadlines

- Runs finished by end of May

- Next meeting: end of may in Berlin (exact date to be fixed) → protocol, responsibilities

- Draft of papers: end august 2013

- Submission papers: december 2013

Thank you for your attention!

- Questions, remarks, suggestions?