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Minute of the PT AEVUS meeting at ICCARUS 2018: status of activities

Participants:

- Edoardo Bucchignani
- Hendrik Wouters (skype)
- Mikhail Varentsov
- Inna Rozinkina
- Jean-Marie Bettems
- Ulrich Schättler
- Jan-Peter Schulz
- Massimo Milelli
- Valeria Garbero
- Mario Raffa

Minute:

The meeting is coordinated by Edoardo Bucchignani (CIRA), since Paola Mercogliano (Task leader) could not join the meeting.

The meeting starts at 17.10, Edoardo underlines the delay of the activities due to the delay in the release of the new model version including TERRA_URB and specifies that the request of PT extension has been accepted by the STC. CIRA has run INT2LM 2.04 and provided boundary data to ARPA Piemonte, while the COSMO model version including TERRA-URB has been installed on the CIRA supercomputer, but crashes.

At first Hendrik summarizes his activities. He performed simulations over Belgium using the current CLM version (v. 5.0_clm9) with and without TERRA_URB (v 2.3), respectively C5.0_URB and C5.0_STD, and now he is performing simulations using COSMO version 5.04g with and without TERRA_URB (v. 2.3), respectively C5.04g_URB and C5.04g_STD. Actually the C5.04g_STD simulations, where urbanization is bare soil, are successful in summer but crash in autumn, while the C5.04g_URB simulation has crashed after 24 hours, and this behaviour looks similar to the experience of Mikhail and Arpa Piemonte (see below). Concerning the C5.04g_STD crash, it could be due to too small *cimpl* values or to *itype_vdif* set to 1 (it has to be set to -1!). The comparison between C5.0_STD and C5.04g_STD results shows that the new version has an overall underestimation (overestimation) of day time (night time) temperature at lower surface compared to the old version, hence a too small diurnal cycle. The urban heat island is not represented well since C5.04g_STD considers urban impervious fraction (FR_PAVED) equal to zero.

Then Mikhail presents his work. He performed simulation over Moscow using COSMO-CLM model (version??) with and without TERRA_URB (version??). A tuned model configuration has been achieved in order to have a better agreement with the observations and urban parameters have been derived from GIS-processing Open Street Model (OSM) that seem more realistic than those provided by EXTPAR. The results show that the tuned configuration represents quite well the Urban Heat Island effect on 2m temperature (better nocturnal than daily) and humidity and on his vertical structure. Now he is going to perform the same simulations (same setup and same IC/BC) using the COSMO model 5.04g with TERRA_URB (v.2.3) but it crashes by switching on the TERRA_URB scheme

(*Iterra_urb=.true.*). The same problem concerns simulations performed by Arpa Piemonte over Turin using the COSMO mode 5.04g: they work fine without TERRA_URB but they crashes after few timesteps if the TERRA_URB scheme is switched on (*Iterra_urb=.true.*) and *itype_canopy=2*; they crash after few hours with TERRA_URB and *itype_canopy=1*.

In order to face the problem of the new version crashing if TERRA_URB is switched on, Uli suggests to Hendrik, Mikhail and Massimo to send him their test-case setup, so that he will do some test and verification and he will be able to provide a model configuration working for all.

Concerning the tuning of some external parameter, Jean-Marie points out that it is useful but it goes beyond the goal of the PT AEVUS to have a robust urban scheme. Interest is expressed on the tool that derived the urban parameter from Open Street Map, but it is not available at the moment for other cities: maybe it could be the target of another Priority Task.

Jan-Peter suggests that it could be better to use lower values of *cimpl*, i.e. equal to 40-50, in order to face with the instability problem. It could be also interesting to investigate the skin-temperature formulation with and without the TERRA_URB scheme (in the later case *ntile=0*).

Finally a quick review of the task shows that, once resolved the “crashing problem”, each partner will have to choose some case-study (subtask 1), then it must be provided a user’s guide with practical instructions for using TERRA_URB (subtask 2) and finally simulations and evaluations will be performed (subtask 3). Therefore the extension of the PT until the end of December should be sufficient to cover the initial delay.

A video conference before the General Meeting is suggested in order to keep the partners updated about the progress.