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A new urban parameterisation for the ICON atmospheric model

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A new urban canopy scheme for the ICON atmospheric model is presented. Increasing the resolution of atmospheric models for numerical weather prediction (NWP) or climate simulations allows, among others, for a more realistic description of the processes at the land surface. Here, one field of growing interest are the processes in urban areas. Beside their relevance for the meteorological modelling, there is a general trend in most countries that the number of people living in towns is significantly increasing. During the recent years, an urban canopy parameterization was developed for the multi-layer land surface scheme TERRA of the Consortium for Small-scale Modeling (COSMO) mesoscale atmospheric model. This parameterisation, TERRA_URB, originally developed for the climate version of COSMO and then ported to the NWP version, was shown to be able to reproduce the key urban meteorological features for different European cities. In the framework of the transition of the COSMO Consortium to the ICON model, TERRA_URB needs to be implemented in ICON. Furthermore, an updated set of urban canopy parameters needs to be provided, for describing the urban characteristics down to a mesh size of 1 km, and below. For these purposes, the COSMO Consortium organises the dedicated Priority Project CITTA'. First results are presented for TERRA_URB in the ICON limited-area model ICON-LAM for different cities of interest of the CITTA' partners. The preliminary results indicate already that urban features like the urban heat island effect are well represented. This is in agreement with the experiences with TERRA_URB in the COSMO model, both the climate as well as the NWP version.

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