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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

The importance of complexity of city structures for modelling the urban impact

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The urban module BEP (building effect parameterization) was developed to include thermical and dynamical changes caused by the presence of city structures. In mesoscale modelling with resolutions about 3 - 30 km there are only few urban points representing a city. Such an urban gridcell contains a range of values for each morphological property like typical widths and heigths of the buildings, widths of the streets
as well as street directions, which are needed as input parameters for the BEP module. The city is divided in several subdomains, which share common features, called urban classes. Every gridd cell is dominated by one urban class. But in this work a very high resolved (460 m) simulation of the Elbevalley and the city of Dresden with the COSMO model is done, which contains 942 urban points. In this case for each gridcell the value range is rather small and the mapping to one urban class is unnecessary, because the typical morphological values are directly determinable. In the framework of this project the question raised, which impact has the the choice of complex morphological input parameter or is their a benefit in defining an urban class for each grid cell? Another question is, how important is the choice of the external parameter like the soiltyp of urban grid points in an urbanized version of the COSMO model? Is there a need of defining a special soiltyp "city" or is it necessary to adjust the plant cover value? The urban fraction is one input parameter of the BEP module and is used as a weight to determine the surface temperature as an weighted average of the street temperatur (BEP) and the surface temperature (COSMO). The former is calculated by means of solving a heat diffusion equation in 10 layers in the street with the boundary condition of radiation balance an the top layer. The later is strongly dependent on the external parameters. A set of senitivity studies for a hot summer period were performed in order to give an answer to the raised questions.