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The Single-column Urban Boundary Layer Intercomparison Modelling Experiment (SUBLIME): results of revised recipe.

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Models for weather and climate have been actively populated with urban canopy models in the last decade. Urban canopy models are available with different levels of complexity. In an earlier study several urban canopy models have been evaluated in offline mode (Grimmond et al. 2011). However, in reality these schemes operate within a numerical weather prediction model, and are coupled with the atmospheric boundary layer. Within the SUBLIME model intercomparison study, single-column models equipped with urban canopy models are evaluated against observations for a clear sky case over London. As such we aim to unravel whether model sensitivity for urban morphological parameters is similar in coupled and uncoupled model. Moreover, the SUBLIME project provides a benchmark for future model evaluation and further development. The SUBLIME experiment consists of a forecast task over a 54 hour period (23-25 July 2012), during which clear sky conditions persisted over London. It consists of two main stages, firstly an offline urban canopy model run, to determine how the surface scheme performs. This is followed by a run in which the urban canopy model is coupled to a single-column model to simulate the coupling to the urban boundary layer. Model forcing data were provided by flux tower, LIDAR and radiosonde observations. Additional external forcings for geostrophic wind speed and advection of heat, moisture and momentum which could not be directly observed were simulated using, 3-D WRF (Weather Research and Forecasting model) model runs. This presentation will discuss the modelling results using the new revised external forcings. We evaluate model outcomes against surface radiation and energy balance observations for both stages. For the second stage, modelled vertical profiles of wind, temperature and humidity as well as boundary-layer height are compared against observations and between models. Finally, differences in model results are identified and the physical processes responsible for these are explored using process diagrams.