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Towards improving the simulation of meteorological fields in urban areas through updated/advanced surface fluxes description

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Abstract. The increased resolution of numerical weather prediction models allows nowadays addressing more realistically urban meteorology and air pollution processes. This has triggered new interest in modelling and describing experimentally the specific features and processes of urban areas. Recent developments and results performed within the EU-funded project FUMAPEX on integrated systems for forecasting urban meteorology and air pollution are reported here. Sensitivity studies with respect to optimum resolution, parametrisation of urban roughness and surface exchange fluxes and the role of urban soil layers are carried out with advanced meso- or sub-meso meteorological models. They show that sensible improvements can be achieved by higher model resolution that is accompanied with better description of urban surface features. Recommendations, especially with respect to advanced urban air quality forecasting and information systems, are given together with an assessment of the needed further research and data.

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