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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

The impact of the urban surface forcing on temperature and humidity near the ground in the city of Paris during summer 2006: model evaluation and results.

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Using a mesoscale meteorological model updated with a simple urban parameterization for the surface energy balance, we are analysing the maximum impact of the urban surface forcing on the local temperature, humidity and wind speed during summer clear-sky conditions in Paris. A "Base run" is performed to validate the model with several ground measurements for temperature and we also validate the diurnal cycle of the impact of the urban heat island by comparing station measurements in rural and urban areas. By comparing the output from the base-run with an additional "scenario run" for which the city surface is replaced by its natural surroundings, we analyse the magnitude, spatial range and the diurnal cycle of the impact of urban heating on the local temperature during a 5-day period of UHI-favoured conditions. A maximum temperature difference (ΔT) of 6.1K between the two runs is found at the first model layer near the surface at 23 hours in the city center. During the night between 23 hours and 5 hours under stably stratified boundary layer, the urban surface impact remains strong at the surface but it is only limited to a height of 200 meters for which we find a significant (ΔT) more than 0.5K. During the day under unstable atmospheric conditions, (ΔT) is only 2K at the surface, but significant values of more than 0.5K reaches up to 800 meter.