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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Variability of meteorological conditions on a micro scale in urban surroundings

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Inner-habitat variability may obscure the influence of urban/periurban climatic effects recorded by standard meteorological stations. These are the first results of a weather station network implemented within a project on urban system research (MILIEU) in spring 2010 in order to examine microclimatic aspects of inner-city tick habitats in Berlin. In general, urban effects, such as urban heat island, influence of urban green as well as ecological or environmental considerations, are analyzed either by using standard meteorological data from weather services or by selective short term measurements.
In contrast, our newly implemented measurement network provides "tick-climate-stations" (especially designed to measure meteorological conditions up to 1m above ground) and additional small scale data loggers to record meteorological variability under the canopy of urban green. The stations have been established in an inner-city park, in two urban forests and at a green backyard of a housing area, within 1 km of the main railway station of Berlin. For three of these sites, standard meteorological stations operated by the Free University of Berlin are in 50 to 500 m proximity. This measurement ensemble, therefore, is able to display the diversity of urban living conditions. It provides concise information in space and time about the variability of meteorological conditions on a very small scale.
The maximum recorded actual temperature difference between standard and tick station (distance 100 m) is 5 K on a summer day in 2010, with a daily mean temperature of 26 °C. Other important parameters also differ significantly such as night time temperatures or diurnal variation. Hence the questions derive: May standard weather stations be used to describe small scale microclimatic conditions? May results from standard weather stations be transferred to a small scale? Some answers shall be given in this presentation.