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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Surface Urban Heat Island in Brno (Czech Republic) and causes of its spatial variability

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Surface Urban Heat Island (SUHI) of Brno (second largest city of the Czech Republic, population 400,000, cadastral area 230 sq km) is characterized using Land Surface Temperatures (LST). LST fields were modeled using available thermal imagery from Terra ASTER and Landsat ETM+ satellites. Overall intensity of SUHI was defined as a difference between mean LST for urban and non-urban areas within the study region. As the Brno is typical with complex relief and specific structure of built-up areas, several factors such as digital elevation model and its derivates, density of built-up areas or density of vegetation areas were used as explanatory variables for LST spatial changes. Industrial areas, old factories and large shopping malls create hot spots with significantly higher LSTs compared to residential areas and areas with higher percentage of vegetation cover. Such parameters like density of buildings or total length of streets explain more than 40% of LST spatial variability within the region. LSTs of agricultural areas with less vegetation cover that are situated in southern part are comparable to those of urban surfaces. Due to relief configuration and land cover distribution a pronounced increase of LST from north to south is typical for the study area.