



The role of anthropogenic heat in urban climate

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Urban regions are known to influence on the regional climate in a different number of ways. A variety of research studies deal with the urban heat island, the generation of turbulence as well as the acceleration and deceleration of wind over the heterogeneous city building. Since more and more people will move to the cities in future, an investigation of the urban climate and its impact on the comfort of its citizens is highly important. One feature of urban regions is the emission of anthropogenic heat. Recent studies show that the anthropogenic heat is not only an important player for the urban climate but has also an impact on the large scale atmospheric dynamics in the atmosphere. Thereby, a challenging task is the quantification of the anthropogenic heat.

In our contribution the focus is on the quantification of anthropogenic heat and its small-scale contribution to the climate in urban region. Therefore, it is shown how to derive anthropogenic heat fluxes for cities aiming at high temporal and spatial resolution. Often an inventory approach and a top-down methodology is used, i.e. one starts with an annual energy budget report and ends up with a high-resolution information about heat fluxes in the region of interest. Since different approaches and assumptions are applied e.g. to simulate the population density at different times of the day, a certain degree of uncertainty with respect to the anthropogenic heat fluxes is inherent to this methods, which will be highlighted in our contribution. Taking exemplary the metropolitan region of Hamburg, the quantification and the impact of anthropogenic heat is presented.