



Towards a universal formula for the urban heat island using model output and field observations

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The urban heat island (UHI) has been the subject of numerous studies worldwide, dating back as far as the 19th century. The phenomenon has been observed in large cities as well as in small villages. However, universal and simple models to estimate the UHI are still lacking. Besides internal factors, such as evaporation in a city (through vegetation, soil moisture, or surface water) or thermal properties of the buildings, there are also external factors to consider (e.g. wind speed and direction, cloud fraction or the stability of the atmosphere). Including all the relevant factors makes deriving a simple model a challenging task. In this research we aim to make a next step by combine observational data and model output of the UHI in several different settings (e.g. datasets for different locations around the globe with different urban properties and weather conditions). Over this large dataset we will perform a statistical analysis in order to identify the most important factors in governing the UHI. Next, we perform a dimensional analysis with the most important contributing factors. The dimensional analysis based on just model results shows promising results. Here we extend the analysis using field observations from a number of cities around the world.