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Mapping The Urban Heat Island Effect In Athens: Results Obtained From The UHI and Thermopolis 2009 Projects

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Urban Heat Island (UHI) is an urban climate phenomenon, which is described by the occurrence of temperatures that are higher over urban surfaces than over surrounding rural areas of similar elevation. The phenomenon is particularly pronounced during night-time. UHI is primarily driven by the shortwave incoming radiation energy reaching the urban surface, which has very different physical properties from rural areas.

Contemporary technologies such as airborne/satellite remote sensing, offer unique capabilities for mapping and monitoring UHI at different spatial and temporal scales, and ideally extend and complement ground-based techniques.

To assist in understanding the UHI effect and its complexities in European cities through the combination of spacecraft remote sensing and ground-based observations, a relevant project entitled “Urban Heat Islands and Urban Thermography” was launched recently by the European Space Agency (ESA).

In the framework of the aforementioned project, the “Thermopolis 2009” campaign was implemented by a wide consortium in Athens during the summer of 2009, with the aim to provide a mapping of parameters related to the characterization of UHI at different spatial scales. During the Thermopolis campaign abundant airborne and satellite observations concurrently to ground measurements were collected for the study site. This paper aims to present results from the analysis of the different spatial scale datasets collected during the Thermopolis campaign, discussing also various aspects of the UHI for the studied region, on which the analysis has been conducted thus far.