

Outdoor Thermal Environment Measurement and Simulations in Traditional Settlements in Taiwan

Authors : Tzu-Ping Lin, Shing-Ru Yang

Abstract : Climate change has a significant impact on human living environment, while the traditional settlement may suffer extreme thermal stress due to its specific building type and living behavior. This study selected Lutaoyang, which is the largest settlement in mountainous areas of Tainan County, for the investigation area. The microclimate parameters, such as air temperature, relative humidity, wind speed, and mean radiant temperature. The micro climate parameters were also simulated by the ENVI-met model. The results showed the banyan tree area providing good thermal comfort condition due to the shading. On the contrary, the courtyard (traditionally for the crops drying) surrounded by low rise building and consisted of artificial pavement contributing heat stress especially in summer noon. In the climate change simulations, the courtyard will become very hot and are not suitable for residents activities. These analytical results will shed light on the sustainability related to thermal environment in traditional settlements and develop adaptive measure towards sustainable development under the climate change challenges.

Keywords : thermal environment, traditional settlement, ENVI-met, Taiwan

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