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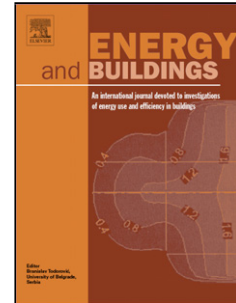
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Outdoor thermal comfort and activities in the urban residential community in a humid subtropical area of China

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Highlights

- Long term data in different seasons in residential communities was collected.
- Outdoor thermal sensation and comfort varied with seasons.
- The resident adapted to outdoor space by adjusting behaviors in different seasons.
- The attendance related to the values of PET variesly in different seasons.
- Sunny and shady subspaces should be setted in residential community planning.

Abstract

A comfortable thermal environment is extremely important for the enjoyment of outdoor spaces. The relationship among microclimate, thermal sensation, and human behavior is expected to provide guidelines and implications for outdoor space design and planning practice. Given that, this study aimed at a better understanding of outdoor thermal comfort and activities in the residential community in a humid subtropical area of China. This study counted the number of people staying at the outdoor space, recorded physical measurements, and collected questionnaire surveys to determine the thermal comfort and activities of the outdoor space. Analysis results confirmed that the thermal experience and expectation existed and changed people's perceptions about the outdoor thermal environment in different seasons. The 90% acceptable physiologically equivalent temperature (PET) range affected by the local climate and thermal adaptation was 18.1–31.1 °C. The residents adapted to the outdoor spaces through adjustment of clothing, activity spaces and activity times in different seasons. These findings shed light on the optimal design of outdoor spaces for increasing the utilization rate. Sunny and shady subspaces should be considered to provide residents with more opportunities to interact with the environment for different seasons, thus improving their thermal comfort and the usage rate.

Keywords: Humid subtropical area; Residential community; Outdoor thermal environment; Outdoor thermal comfort; Activities

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