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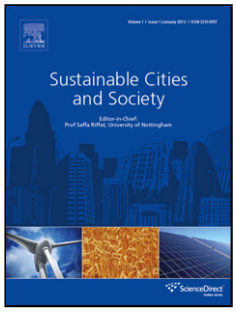

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Effect of water flow on building integrated semitransparent photovoltaic thermal system with heat capacity

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Highlights

- Water cooled building integrated semitransparent photovoltaic thermal systems.
- Effect of water flow and water mass on performance of BiSPVT system.

Abstract:

In this paper, the simultaneous effect of heat capacity and water flow (evaporative cooling) over Semitransparent Photovoltaic modules have been studied. Analytical expressions for room air temperature, floor temperature, solar cell temperature, water temperature (in the tank), tank temperature, water temperature (over the roof), solar cell efficiency, daylight savings and electrical energy have been derived. A comparative analysis has been done with and without the water flow of the proposed system to understand the cooling power offered by water flow over the roof. The computations have been carried for a typical day for the month of June, in New Delhi, India. The effect on different water mass and mass flow rate has also been studied. It was found that there is a drop of 27.88 ˚C in the peak room air temperature due to the cooling