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## **CONTINUOUS SURFACE TEMPERATURE MONITORING TO ESTIMATE SENSIBLE HEAT LOSS BY BUILDING FINISHES**

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### **Abstract**

This paper proposes a novel technique, Continuous Surface Temperature Monitoring (CSTM), that uses infrared technology to estimate the sensible heat (SH) transfer between building finishes materials and the surrounding environment *without* knowing the physical and thermal properties of the tested materials. It is critical to study the contribution of heat transferred by building fabrics to the Urban Heat Island (UHI) effect because of the increasing threat of global warming. One method to investigate this is to measure the SH loss of building fabrics. Its magnitude is the product of object's mass,  $m$ , its specific heat,  $c$ , and its temperature change,  $\Delta T$ . In this study, CSTM estimates the cooling curves of four building finishes tiles: concrete, marble, clay, and ceramic. The results are quite satisfactory in that there is only 11.86% error between the SH calculated by the formal Sensible heat equation ( $mc\Delta T$ ) and the CSTM technique. The study also shows that clay tiles have the highest SH loss per unit volume to the surrounding environment, and the optimal parameter settings for the technique are discussed.

*Key words:* continuous temperature measurement, infrared technology, sensible heat, urban heat island effect

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