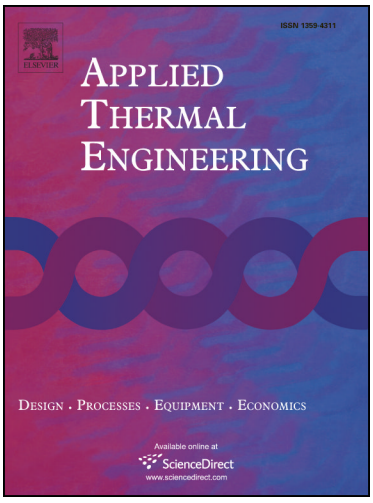

Research Paper

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Experimental investigation and dynamic modeling of a triple-glazed exhaust air window with built-in venetian blinds in the cooling season

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Abstract

A new triple-glazed exhaust air window with built-in venetian blinds is described and investigated in this paper. In this type of window, the exhaust air passes through the air cavity between the glass panes before being released to the outdoor environment. Part of the heat or cold energy inherent in the exhaust air can be recovered. The temperature differential between the interior surface of window and indoor air can be directly reduced, which would benefit the indoor thermal comfort. To investigate the dynamic thermal behavior of the triple-glazed exhaust air window, an improved zonal model was built and validated by using the on-site experimental data. Temperature distributions of this window in both vertical and horizontal directions were analyzed. The influences of the airflow velocity in ventilated cavity and the slat angle of venetian blinds on the thermal performance of the window on a typical summer day were quantitatively investigated. The U-values of this window

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