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Abstract

Natural ventilation of building provides improvement of internal comfort and air quality conditions leading to a significant reduction of cooling energy consumption. Design of natural ventilation systems for many types of building is based on buoyancy forces. However, external wind flow can have significant effects on stack- driven natural ventilation. Investigation of stack- driven airflow through rectangular cross- ventilated building with two openings using analytic technique was presented. Equations governing air flow are utilized. Approximation of reduced gravity is invoked. A solution of the model Equations for stack- driven airflow through rectangular openings with uniform interior temperature was obtained. The solution predicts the following; dimensionless- velocity-, temperature profiles together with volumetric airflow and mass transfer were obtained and evaluated numerically for several sets of values of the parameters; such as effective thermal coefficient (

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Index Terms

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Keywords

Velocity-, temperature profile; volumetric; mass- transfer;