Airflow Process Across Vertical Vents Induced by Stack-Driven Effect with an Opposing Flow in one of the Openings

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 123
Number 1

Year of Publication: 2015

Authors:
A.L. Muhammad, A.B. Baffa

10.5120/ijca2015900728

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 buoyancy-driven natural ventilation. Airflow process across vertical vents induced by stack-driven effect with an opposing flow in one of the openings was presented. Equations governing air flow are utilized; models of fluid and thermo-dynamical problems have been described. Boussinesq assumption is invoked and analytic techniques are employed to obtain the possible solutions of model equation. Various parameters on air flow process were used to see the effect of changes of parameters to the overall flow distributions, and ascertain the best one for optimal natural ventilation.

References
18. XueMin Sui, Yanling Guan et al. 2010. Influence of Inlet Area on Thermal Natural Ventilation in Rooms. School of Environmental Science and Engineering Chang’an University, Xi’an, PR China. 2385- 2388.


Index Terms

Computer Science

Information Sciences

Keywords

Effective velocity distribution, Airflow Rate, Mass - transfer Rate, Effective Temperature Distribution