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Research on Passive Solar Ventilation and Building Self-Sunshading

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Abstract:

Strengthen heat insulation, prevent heat, reasonable decorate a building group, the nature of the room is ventilated wait for a method with setting window sunshade, try to be applied integrated, will surely get the favorable result that prevent heat. This study focuses on how to achieve natural ventilation and shade for energy saving by using of passive solar ventilation technology combined of building self-shading technology in building design. Simulates and analyses the velocity and temperature fields inside the external respiration double skin facade of a building. This research was carried out at CFD FLENT software, and heating load of Solar are calculated by using the Solar Load Model of FLENT, different forms of glass curtain wall combined with sunshade are calculated in physical model. All-year hourly dynamic heat load, ventilation and Indoor Dynamic Thermal Environment are calculated based on the hourly calculation results and detail analysis, which will provide useful guidance for using of solar passive ventilation technology combined of building self shading technology in building design.

Published in: Computer Distributed Control and Intelligent Environmental Monitoring (CDCIEM), 2011 International Conference on

Date of Conference: 19-20 Feb. 2011

INSPEC Accession Number: 11932723

Date Added to IEEE Xplore: 11 April 2011

DOI: 10.1109/CDCIEM.2011.171

ISBN Information:

Publisher: IEEE

Conference Location: Changsha, China

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I. Introduction

Glass is an important component of the building, It plays a very important part in heat preservation, attractive in appearance of the building, natural light and ventilation. But it is very difficult to achieve all of these features for they are interrelated and restricted each other. Ventilation and shade are the chief factors for energy efficiency of building of Hot Summer and Cold Winter Zone. The designers had to control the area of building windows and doors in order to achieve the goal of the construction energy conservation in architectural design, so large-scale glass curtain wall applications is restricted. But a large number of glass curtain wall is used in modern architectural design in order to achieve natural light and attractive in appearance. It is one of the major difficulties how to achieve the goal of natural ventilation and shade in building design based on large area of glass used.

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