

Natural Ventilation around and through Building: A Numerical Study

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Abstract : Limiting heat losses during ventilation of indoor building spaces has become a basic aim for architects. Much experience has been gained in terms of ventilation of indoor spaces. Nevertheless, due to the complex applications, attempts to create a theoretical base for solving the problems related to the issue are limited, especially determining the minimum ventilation period required within a designated space. In this paper we have approached this matter, both theoretically and computationally. The conclusion we reached was that controlled ventilation of spaces through vent holes that successively open and close at regular time intervals can limit the excessive circulation of air masses, which in turn limits heat losses. Air change rates through open and tilted windows in rooms of residential buildings driven by atmospheric motions are investigated to evaluate natural ventilation concepts. Model of thermal building simulations is used. A separated sample storey and a sample single room in larger scales were used to measure air transport through window openings under the influence of the external pressure distribution.

Keywords : natural ventilation, temperature factor, air change rates, air circulation

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