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Experimental Investigation of Convective Couplings Across Various Doorways Under Horizontal Temperature Gradients.

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Call for Papers

Venue: Chateau Laurier, Ottawa, Canada

Date: Tuesday 24th to Friday 27th September 1991

Proposed Paper

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Abstract

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Inter-zone convection affects the general movements of air in a building and must be evaluated for accurate thermal zones heat and mass balance.

The paper presents results of an experimental study of convective heat transfers caused by temperature difference between two zones connected by an opening of height 2.05 m and varying width. Experiments were carried out in a full scale calorimetric chamber (5.5 m x 2.5 m x 2.5 m). Temperature differences were maintained by two active vertical walls located on either side of the doorway.

Convective heat transfers were deduced from energy balances and expressed in terms of Nusselt, Grashof and Prandtl numbers, i.e.:

$$Nu/Pr = C \cdot Gr^{m}$$

The C and m parameters were obtained from the analysis of approximately 30 experiments for various temperature differences and opening width.

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