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Investigation on Balcony Plume Entrainment

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Abstract: An investigation on the scenarios of the spill plume and its equation was presented in this paper. The study includes two aspects, i. e., the small – scale experiment and the numerical simulation. Two balcony spill plume models are assessed by comparing with the FDS (Fire Dynamic Simulation) and small scale model experiment results. Besides validating the spill model by experiments, the effect of different fire location on balcony plume is also discussed.

The results show that the balcony equation in NFPA would give good predictions on the mass flow rate. And the balcony plume entrainment coefficient is independent of the fire location. The Investigations in this paper are useful for the fire engineers in designing smoke control systems.

Keywords: fire plume/ entrainment/ atrium

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