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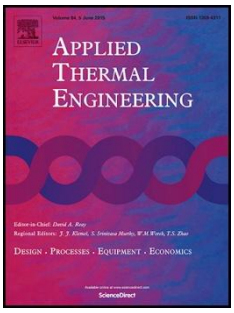

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Thermal buoyant smoke back-layering length in a naturally ventilated tunnel with vertical shafts

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Highlights

1 Smoke propagation are researched experimentally and numerically

2 The effects of shaft dimension on back-layering length are researched

3 Formula of back-layering length is deduced based on dimensional analysis

Abstract: A series of full-scale experiments are carried out in tunnel with vertical shafts to research the effects of shaft on the smoke propagation in tunnel fires. Formulas for longitudinal propagation distance are fitted from experimental data using Origin software. Based on experimental data, Computational Fluid Dynamics model is built and validated. Thereafter, different scenarios are numerically studied using FLUENT software to simulate the effect of shaft on back-layering length. At last, a prediction formula for calculating back-layering length is deduced based on fire

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