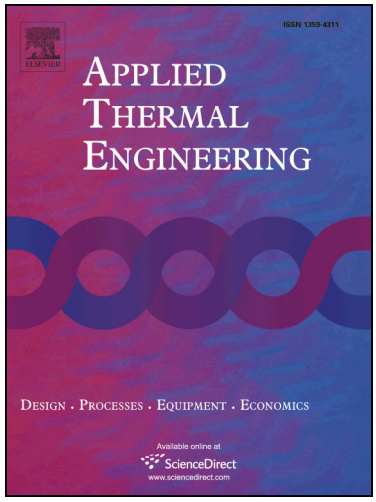

Smoke development in full-scale sloped long and large curved tunnel fires under natural ventilation

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Smoke development in full-scale sloped long and large curved tunnel fires under natural ventilation

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Abstract: A full-scale experiment was conducted to research the smoke development of a sloped long and large curved tunnel in the natural ventilated underground space under three different fire powers. The tests measured the evolution of the longitudinal smoke temperature rise, the fire plume flow characteristics near the fire source and the maximum smoke temperature during the fire growth, stable and decay stages. The results show the asymmetrical temperature distribution, the variation of the vertical position of the maximum temperature rise along the tunnel and the variation of the backflow length due to varying interactions of the fire wind pressure and the natural wind pressure during the complete fire process. The smoke development characteristics during each fire stage are described based on the measured data.

Key words: long and large curved tunnel; full-scale experiment; smoke development; natural ventilation