

SIMULATION OF THE SMOKE LAYER INTERFACE HEIGHT FOR A FIRE INDUCED IN AN ATRIUM

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Abstract. *The calculation of the smoke layer interface height in case a fire breaks out in an atrium is determinant to make an appropriate fire safety system design. Most of the expressions used to calculate it assume no mass flow through the smoke layer interface.*

With this object a numerical model that simulate fire-induced thermal and fluid fields in an atrium using the finite volumes procedure code FLUENT has been developed. The model has been validated from new full-scale fire experimental tests performed at the 'Fire Atrium' of the Technological Metal Centre, Murcia, Spain. At the present work the experimental data from one fire experiment are shown. In this experiment an heptane pool fire placed at the centre of the floor was used, releasing an average heat of 1.8 MW.

A comparison between one empirical expression commonly used and an experimental temperature criterion, both for computing the smoke layer interface height, with the one predicted by the model is performed. The model agrees better with the second one and shows a mass of air across the smoke layer interface should be taken into account.

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