عنوان مقاله:
The Fire Simulation in a Road Tunnel

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خلاصه مقاله:
Fire behaviour, especially its interaction with ventilation system in tunnels, is still a challenging issue for road tunnel designers .This paper presents the results of a study investigating the influence of a road tunnel ventilation system, on conventional fires. For this purpose, a ۲۵ MW fire corresponding to a conventional fire in a road tunnel was simulated using ۲D numerical modelling, for transient viscous multi-component gas at low Mach numbers to study smoke and heat propagation within a road tunnel under fire .Complete Navier-Stocks and Reynolds equations were solved using developed algorithm of numerical modelling .The results from a series of calculations were compared with results of experimental researches to examine the accuracy and stability of the calculations .The comparisons showed that the algorithm provided a good description of physical processes in selected class of flow. It was also concluded that calculation accuracy is not lower than those obtained from established simulation software programs . The stability and good convergence of the algorithm was confirmed by separate calculations with different grid patterns for the tunnel under consideration .The results revealed that the temperature at tunnel wall may rise up to ۹۰۰oC. The concentration of smoke may also increase up to ۹۵ %with a burning truck .Results were applied to assess the ventilation system designed for a new long road tunnel in case of fire .The results from the study along with other information were applied to assess the designed ventilation system and to establish the suitable fire fighting and rescue plan .

کلمات کلیدی:
system, ventilation, safety, Numerical analysis