A BAYESIAN APPROACH TO MODEL VELOCITY FIELDS AND MASS FLOW RATES

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Abstract *With the present work, one aims to study the effects of a jet impinging on an obstacle at a closed car park, which is described by a representative zone with an impulse jet fan and an obstacle. In this study, the flow velocity at two critical heights (1.2 m and 1.8 m) is considered a proxy for measuring the risk to car park occupants in case of fire. To capture the problematic conditions due to the obstacle, a mixture of two probabilistic models was used to simulate a set of jet fan to obstacle distances and jet fan outlet angles. This generated 34 conditions that were simulated using a computational fluid dynamics model. The isothermal incompressible turbulent velocity fields and mass Flow rates in zones of interest were investigated. The statistical model was implemented using STAN and is a Bayesian multiple linear regression to estimate velocity fields and mass flow rates.*

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