THE DIFFUSION OF TOXIC GASES DUE TO AN EXPLOSION IN A TUNNEL. AN ABSORPTION PUMP MODEL.

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In this work we study the diffusion of toxic gas Sarin in a tunnel due to an explosion in order to realize a control system—via a wireless network of active sensors—for identification and immediate containment procedures. To this end an aspiration pump is turned on instantaneously at a distance of b meters from the explosion to mitigate the effects of the terroristic act. We exactly find the diffusion concentration in order to provide a solu- tion useful for comparison to other models: numerical ones or models with many aspiration pumps. The model is described by the diffusion partial differential equation (PDE) with a non-homogeneous term which models the aspiration pump. A model with more suction pumps is presented. The study is carried on together the Italian Army.