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Experimental and Numerical Study on the Dispersion of Heavy Gases in Urban Environments

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Highlights

- Building blocks layout in wind tunnel experiments is designed corresponding to real urban environments.
- A mathematical method is proposed analyzing the increasing and decreasing stages of heavy gas dispersion.
- The coupling effects of building blocks and meteorological conditions were considered.
- Dangerous situations and concentration accumulations in urban environments were analyzed.
- Realizable k- ϵ turbulence model for heavy gases diffusion was verified with experimental data by CFD.

Abstract: Heavy gas dispersion, including gravity settling that causes longstanding high-concentration zones near the ground, has become a popular research topic in recent years. A series of wind tunnel experiments containing complex layouts of building blocks were carried out to illustrate the comprehensive effect of obstacles and environmental factors on heavy gas dispersion and distribution in urban environments. The factors of wind velocity and direction, ental and Numerical Stud17of t

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