Tracer gas experiments for the study of the dispersion of hazardous airborne substances in various subway systems
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Abstract

In case of smoke release by fire or due to an airborne toxin by a terror attack in a subway station or tunnel, information on the dispersion of the hazardous substance is important for the rescue operation because it helps to decide which parts of the subway system can be expected to be contaminated.

The goal of the ongoing OrGaMIR project in Germany is to provide the operating company and rescue forces with this information in case of an emergency. In order to predict the dispersion, airflow and thermal conditions inside selected stations in different subway systems are monitored. This is accompanied by the use of sensor modules for the detection of hazardous substances.

A number of SF6 tracer gas experiments until to date were conducted in several cities with the target to investigate:
- the current air flow and thermal regime under the conditions of different atmospheric stabilities in and outside the underground and
- the spatial and time dependent contamination of the underground air by smoke or toxins.

The paper describes the results of various tracer gas experiments in subway systems of the cities of investigation which are characterized by different building structures and ventilation influences.