ORPHEUS

Optimierung der Rauchableitung und Personenführung in U-Bahn-Höfen: Experimente und Simulationen

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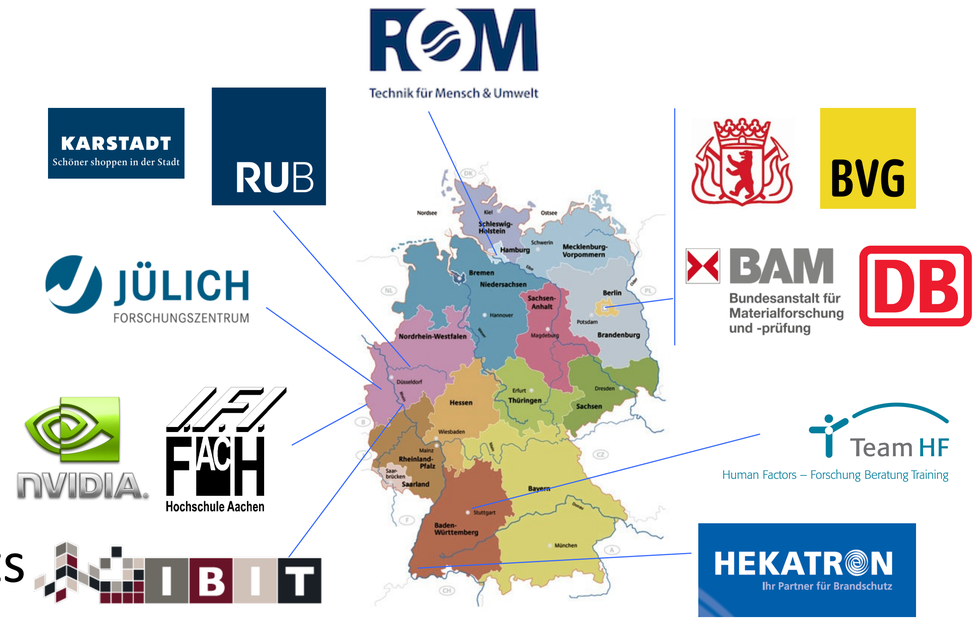
Project Information

Period: 2015 – 2018

Scenario: Smoke spread in an underground station

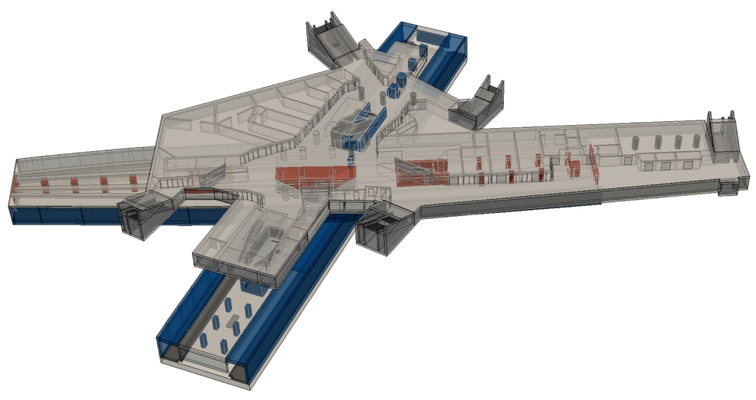
Work packages:

- Experiments to capture the heat and mass flows in complex underground stations and model validation
- Concepts for smoke management and life safety
- Communication and information handling in safety concepts

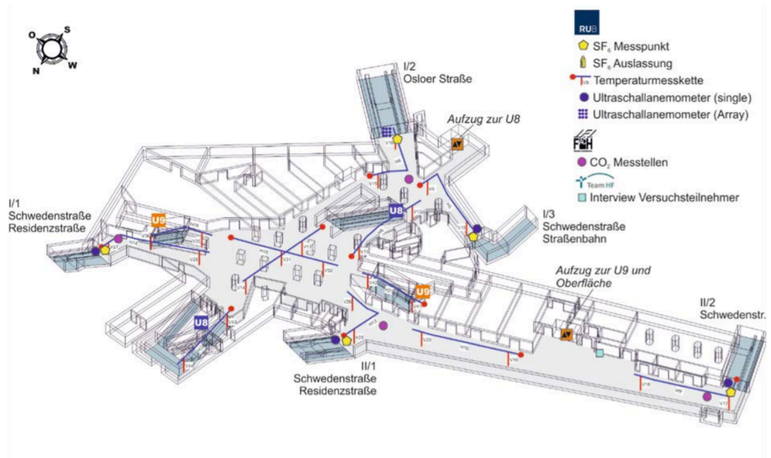


Metro Station Osloer Straße, Berlin

- Crossing station of two lines U8 / U9
- Three underground levels



- Digital 3D model of the geometry
- Used in experiments and simulations



- Long-term climate measurements
- Distributed temperature sensing (DTS)

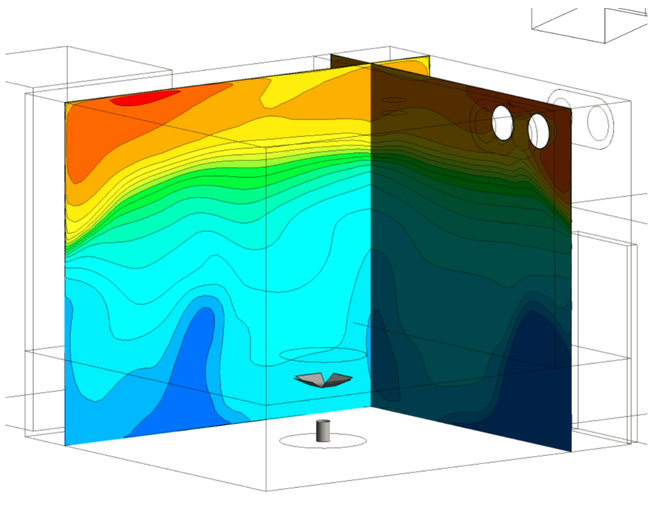
Experiments

- Laboratory experiments
- Sensor calibration with CO_2 and SF_6

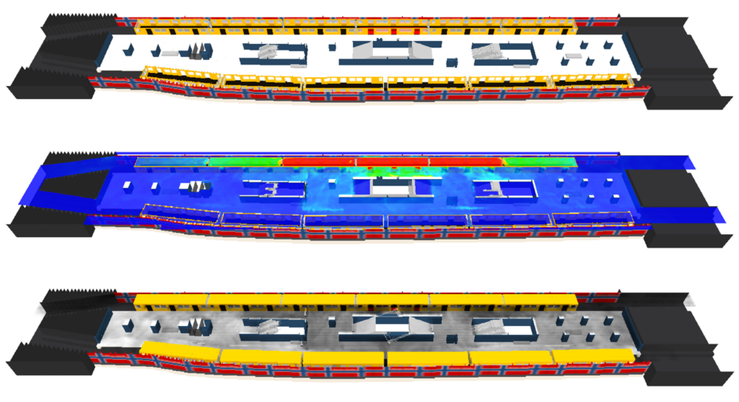
- Occupation numbers and flows
- Orientation and route-choice

- Real-scale experiments at off-hours
- Heat release rates up to 1000 kW

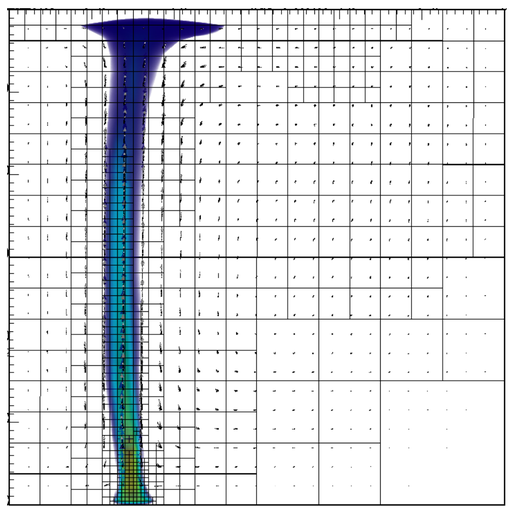
Simulations



- Modelling of laboratory experiments
- Evaluation of CFX and FDS



- Smoke spread in full station
- Large-scale simulations with HPC



- Model development with AMR
- Real-time prognosis on GPUs