

Hazard Prediction and Warning

A Simulation Platform for Real-Time, Buildings-Aware, Contaminant Transport

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We present a virtual environment suitable for predicting urban airflow and contaminant transport. We use large eddy simulation to predict outdoor transport, and well-mixed zonal methods to predict indoor transport. The coupled tool provides a mass-conserving full integration of the outdoor and indoor environments. The tool's numerical implementation enables highly efficient computations on a computer's graphics processing unit. In many uses, a simulation runs in real time. An intended application of the tool is supporting the testing, evaluation, and validation of operational simulation tools, including HPAC. The virtual environment may also be used to assess variability/uncertainty in urban contaminant transport predictions. In this presentation, we show preliminary validation of the tool using data from field experiments. We also show examples of mock urban simulations. Finally, our live demonstration of the modeling system will emphasize the benefits of a simulation that executes in real time.

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