KIKUMOTO LAB.

[Modeling of Wind and Environment in Cities]

Department of Human and Social Systems

Control Engineering of Complex Environmental System

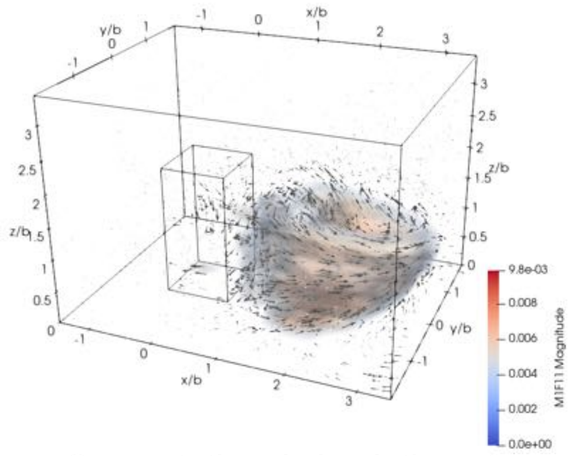
Department of Architecture, Graduate School of Engineering

http://venus.iis.u-tokyo.ac.jp/

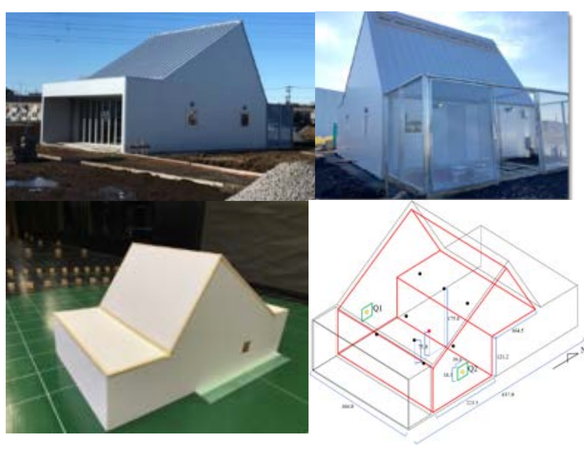
This laboratory makes researches to understand, predict and control urban and building environment. The main research interest is the wind, air and thermal environment. We have been developing monitoring and simulation technologies for each environmental element, and also studying environmental control technology that integrates measurement and prediction techniques by mathematical/statistical methods.

Fluid phenomena in the environment

Wind tunnel experiment of city airflow



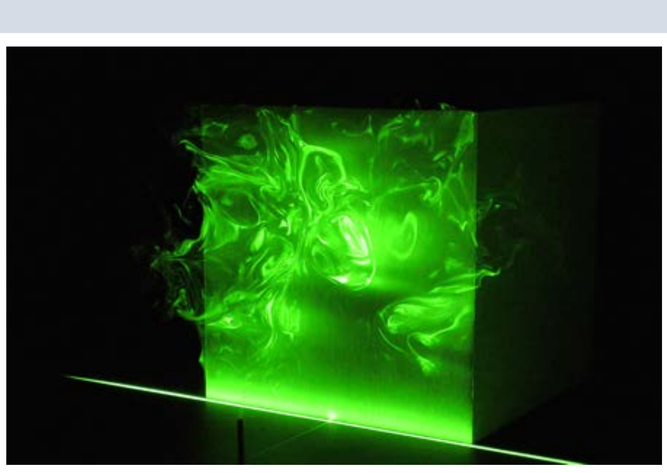
Computational simulation of airflow around building



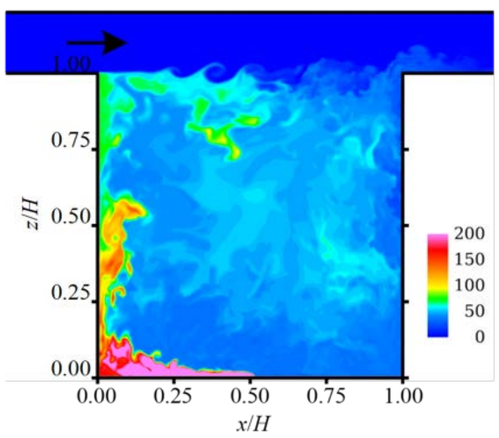
Wind tunnel experiment for building ventilation analysis

We are analyzing the air flow formed in cities and around buildings using observational method, wind tunnel experiment and computational fluid dynamics (CFD).

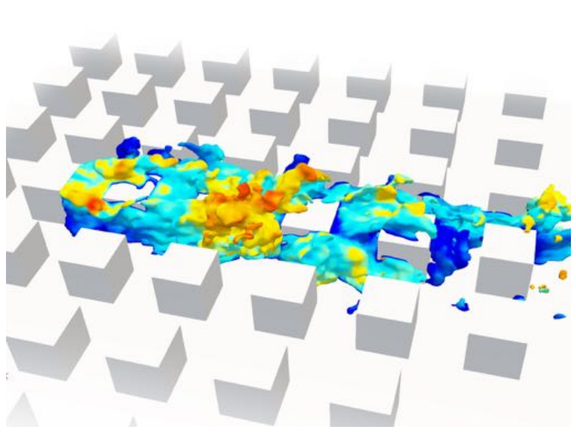
Dispersion modeling of air pollutants



Visualization of pollutant dispersion in wind tunnel



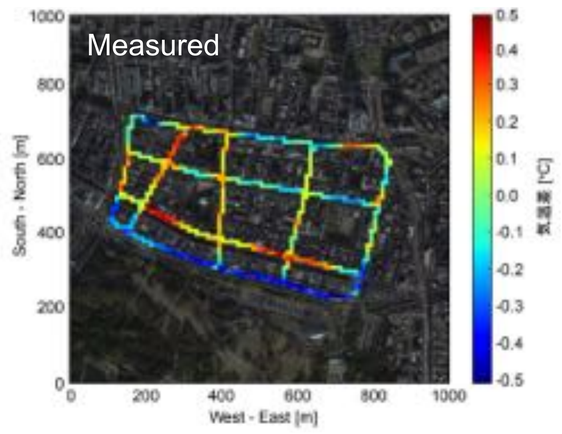
Computational prediction of pollutant concentration using turbulence model

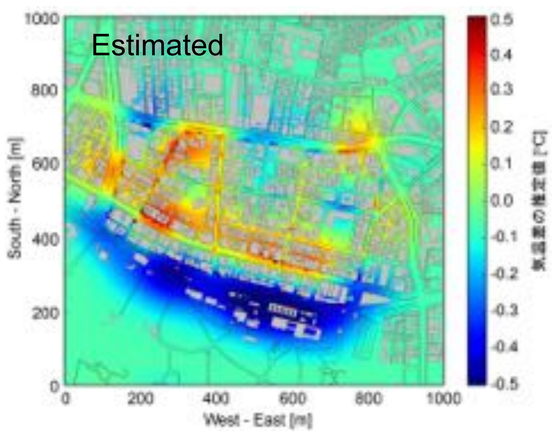


Computational prediction of pollutant dispersion in block-arrayed urban model

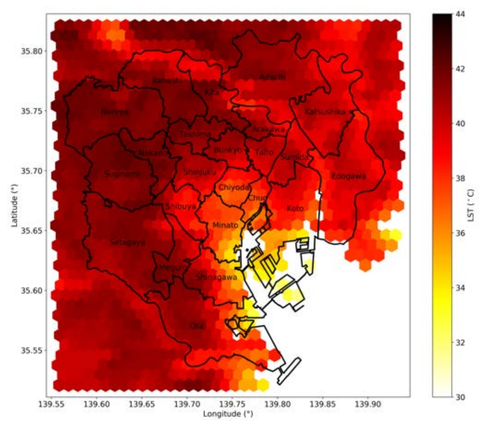
We are developing analysis technologies for the dispersion phenomenon of air pollutants using wind tunnel and turbulence models.

Monitoring of the urban environment





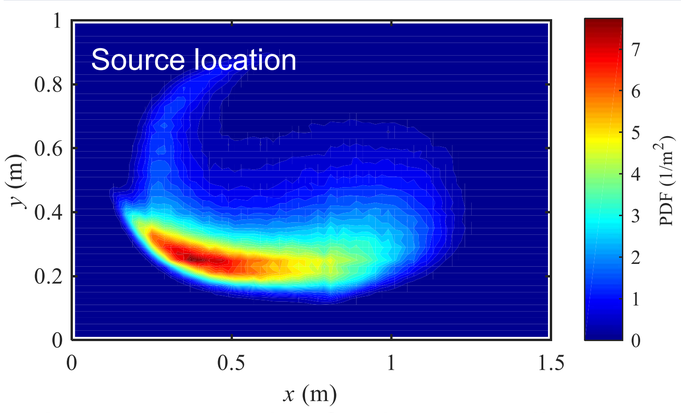
Monitoring of air temperature distribution in a city



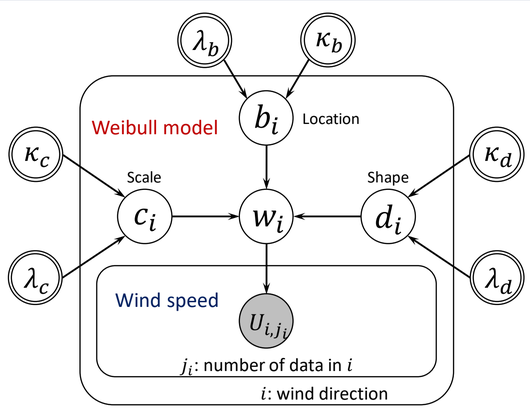
Remotely sensed land surface temperature in Tokyo

We are developing technology to measure urban atmospheric environment with high spatial resolution. We are also studying resolution enhancement technique applying statistical models to the measurement data.

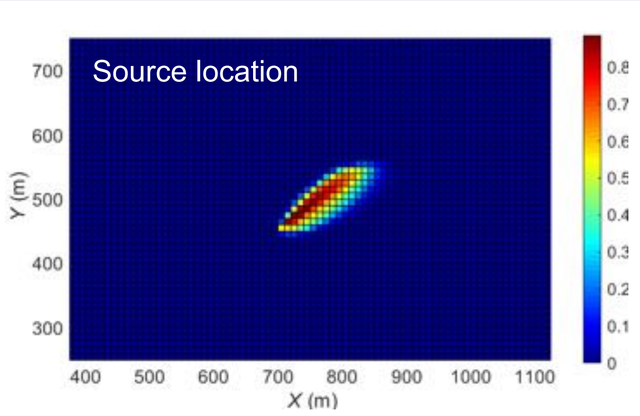
Inverse analysis of environmental parameters



Inverse analysis of unknown pollutant source



Conceptual diagram of wind speed generation



Inverse analysis of unknown line source

We are researching methods of stochastically estimating the environmental factors such as unknown air pollution sources and wind speed using physical and statistical models.