OOKA LAB.

Future urban planning
Future energy system to realize ZEB

Department of Human and Social Systems

Urban Energy Engineering

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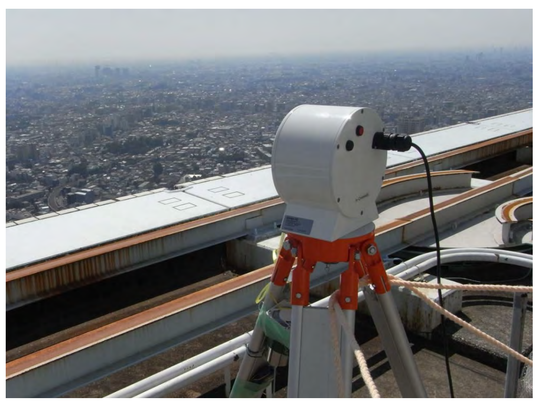
Prediction of Building and Urban Environment

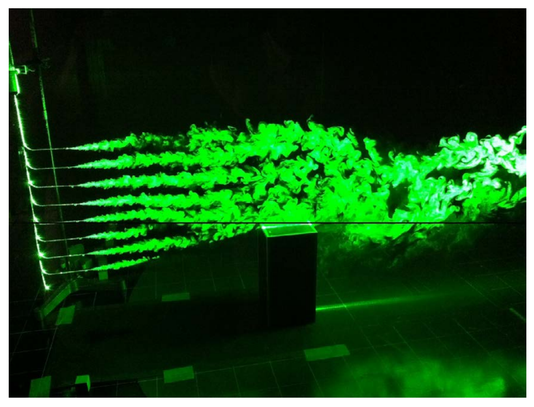
Prediction systems of building and urban environment have been developed to create sustainable building and urban spaces. We focus on flow, heat and pollutant dispersion in multiple scales from human-ambient to urban/regional.

■Wind velocity observation with a Doppler lidar

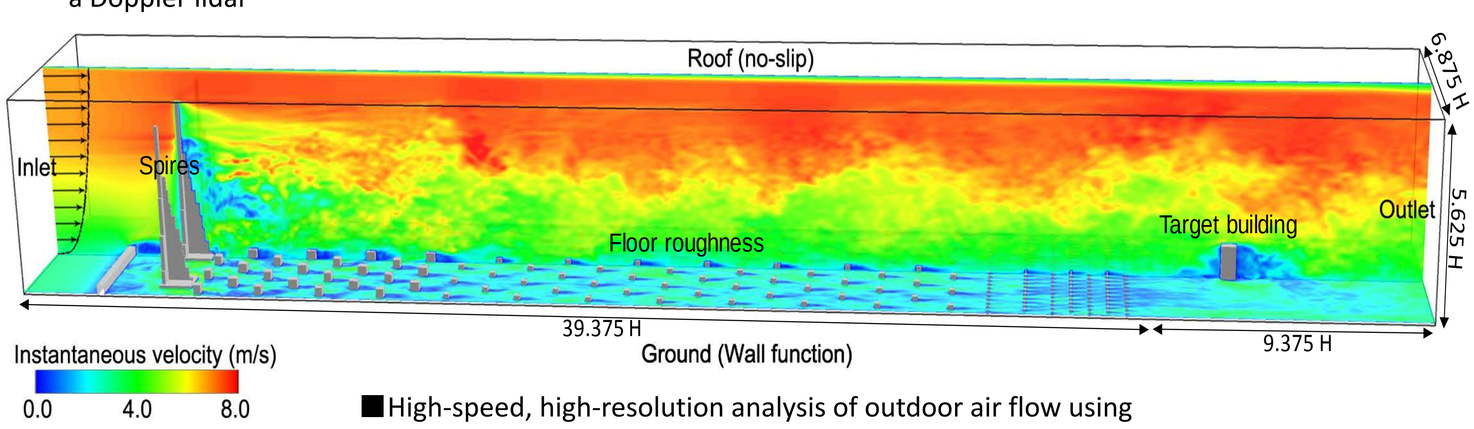


■Estimation of heat fluxes using Scintillometer

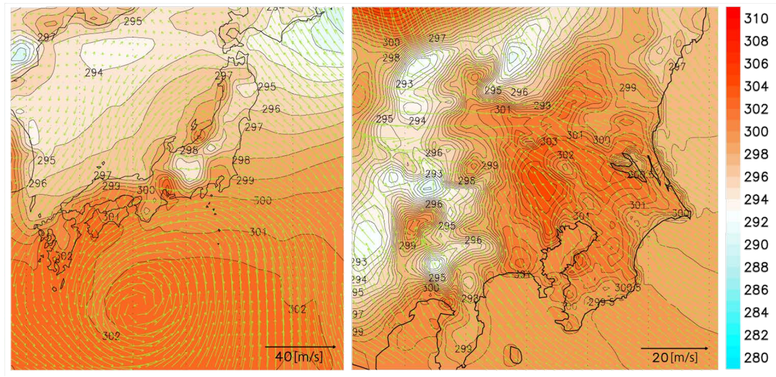
■Measurement of indoor environment and human thermal comfort



■PIV measurement of air flow around building



■High-speed, high-resolution analysis of outdoor air flow using the lattice Boltzmann method-based large-eddy simulation



■Numerical estimation of local climate using WRF
(left: Typhoon No. 10, 2006; right: Heat island effect)

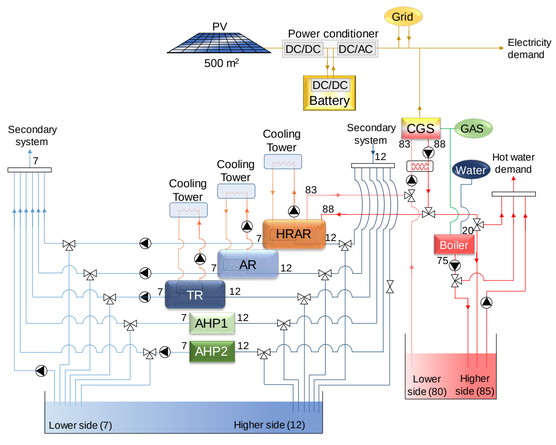
Systems to Realize Zero Energy Building

In order to realize Zero Energy Building (ZEB), it is important to improve the efficiecy of heat source systems. We have improved them to reduce energy comsumption. Air conditioning system with renewable energy sources and optimization of heat source system have mainly studied.

■21KOMCEE at Komaba campus

■HVAC system using Pile heat exchanger

■RE house at Kashiwa campus



■Optimization of thermal and electrical grid

■Experimental system of Thermal response test

■Experimental system of water transport system in HVAC