Pursuit of a safe living environment - through mechanics of bridge and wind -

In order to evaluate safety of structures such as bridges correctly, it is important to predict the precise response of structures due to natural external force and to reflect the results to the design. In this research group, to predict the structural behaviors under wind action, the estimation of strong wind, solving generation mechanisms of various aerodynamic instabilities, developing the structural shapes with excellent aerodynamic performance and the countermeasures against the aerodynamic vibration, the elucidation of mechanisms of wind-induced disasters and so on are conducted by experiments and analyses. Also, the development of health monitoring system for efficient and inexpensive maintenance of bridge after completion using sensor, is one of research topics.

Effect of turbulence on aerodynamic phenomena

The influence of turbulence enables more precise evaluation of wind loads and aerodynamic response of engineering structures. We explore the mechanism of the turbulence effects through wind tunnel experiments.

Time-dependent wind loads under gusty winds

Quantitative evaluation of time-dependent aerodynamic forces on infrastructures is essential when structures encounter gusty winds by tornadoes and downbursts. This research contributes the strong wind disaster mitigation.

Structural health monitoring

The bridges in service should need maintenance and management. Recently, many researches have been made on health monitoring of existing civil structures. In this study, an attempt is made to develop a structural health monitoring system that can detect the damage level by using the soft-computing method like a neural network.

Environmental action on concrete surface boundary due to air-born salt

In order to evaluate the deterioration of concrete structure due to air-born salt, the following three kinds of environmental conditions have to be considered, i.e., exterior condition outside concrete, boundary condition on concrete surface, and interior condition within concrete. The purpose of this research is to clarify the fundamentals on penetration of air-born salt into concrete surface layer and construct corresponding simulation models.

Evaluation of local sea-salt deposition

Sea-salt deposition causes steel material corrosion and degradation of concrete members of infrastructures in coastal area. We aim to develop the evaluation method of local sea-salt deposition from fluid dynamic viewpoints.

Amount of deposition [mg/m²]