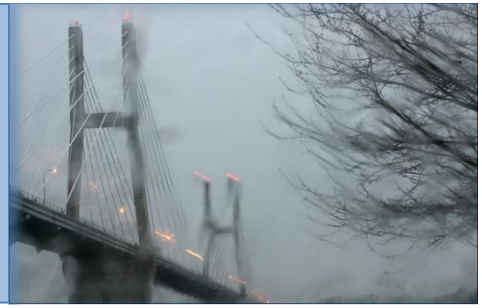
The School of Architecture and Wind Engineering, Graduate School of Engineering
Global COE Program, MEXT

New Frontier of Education and Research in Wind Engineering

1. Fatigue Analysis of Cable Vibration Induced by Wind and Rain

BACKGROUND

■Stay cables are highly susceptible to vibration caused by wind, rain and support motion due to their large flexibility, relatively small mass and extremely low inherent damping. So cable structures are sensitive to fatigue problems.



OBJECTIVE

■Factors affecting fatigue life of cables: wind direction, wind velocity, rain quality, incidence frequency.

■Fatigue reliability analysis: dynamic load-strength interfere model, structural element (a cable), structural system (interface with cable and deck).

ACTIVITIES

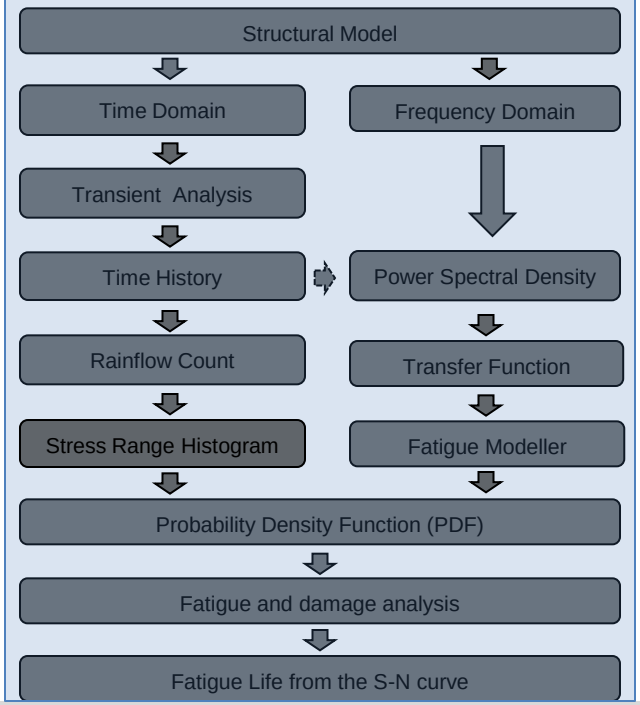
■Improve wind-rain induced model.

■Modify cumulative damage models.

■Combination of damper effect.

■Considered material corrupt.

TECHNIQUE ROUTE



Name and Stand
Zhehua Wu
Global COE
Researcher

Hometown
Shanghai, P.R.China

Profile
Study
●9/2000 ~6/2003, Ph.D., Zhejiang University, PRC.
●9/1993~1996, M. Eng., Harbin University of Civil Engineering and Architecture, PRC.
●9/1989~9/1993, B. Eng., Zhejiang University of Technology, PRC.

2. DAD (Database-Aided Design) of Wind Load

BACKGROUND

■DAD initiated by Dr. Emil Simiu (National Institute of Standards and Technology, NIST).

■DAD enables more accurate estimation of peak wind effects than the simplified procedures in current used.

OBJECTIVE 1

■Build TPU DAD modules.

ACTIVITIES

■Standardize the format of science data and transfer to hierarchical data format including pressure tap coordinates, time series of tap wind pressure coefficients.

■Calculated directional influence factors at structural keypoints.

OBJECTIVE 2

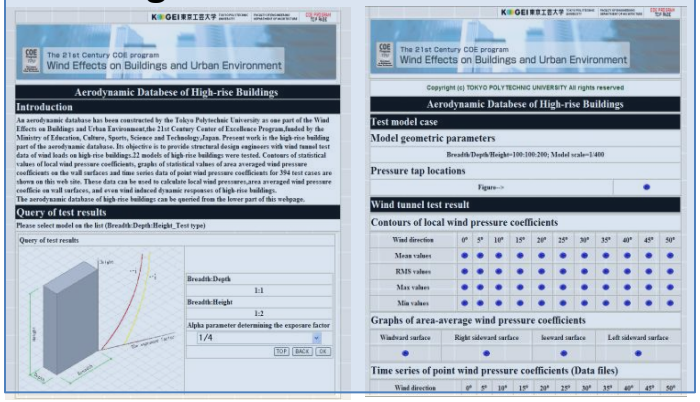
■Comparison of aerodynamic database

ACTIVITIES

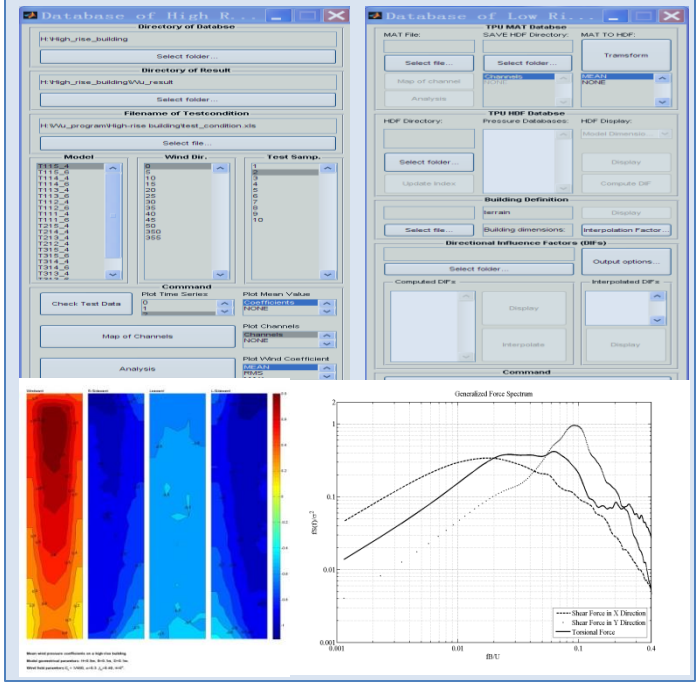
■High rise building: TPU and NatHaz

■Low rise building: TPU and NIST

Aerodynamic database of High rise building



Program of Aerodynamic database



Work

●5/2009~Present, Researcher, Wind Engineering Research Center, Tokyo Polytechnic University, Japan.

●5/2009~Present, Vice General Engineer, Shangda Building Design Institute, Shanghai University, PRC.

●7/2008~4/2009, Senior Engineer, Graduate Supervisor, Department of Civil Engineering, Shanghai University, PRC.

●8/2007~5/2008, Research Associate, Faculty of Engineering, The Chinese University of Hong Kong, Hongkong.

●4/2004~4/2006, Postdoctoral Fellow, Postdoctoral Station of Civil Engineering, Tongji University, PRC.

●8/1996~ 7/2008, Senior Engineer, Ningbo Architectural Design and Research Institute, PRC.

Contact

wuzhehua@arch.t-kougei.ac.jp