

Special issue on Non-Synoptic Wind I

Preface

Non-synoptic winds including thunderstorm downbursts and tornados are responsible for damages of many structures such as buildings and transmission lines around the world. The characteristics of these winds and their load effect are different from those of the traditional boundary layer winds due to the existence of localized and transient features. Characterizing and analyzing these winds and load effects are important in the establishment of the wind load chain for non-synoptic winds. The related studies including the field measurement, physical simulation, numerical simulation and theoretical analysis have drawn significant attention from both meteorological and wind engineering communities in recent years.

This special issue is the first collection on non-synoptic winds, targeting the most recent advances in the field of non-synoptic winds and loads. A total of 5 peer-reviewed papers have been organized in this special issue. In this issue, paper 1 focuses on the numerical investigation of effects of rotating downdraft on tornado-like vortex characteristics, paper 2 on non-stationary statistical modeling of extreme wind speed series with exposure correction, paper 3 on evolution and scaling of a simulated downburst-producing thunderstorm outflow, paper 4 on effect of building proximity on external and internal pressures under tornado-like flow, and papers 5 on laboratory investigation of the effects of translation on the near ground tornado flow field. These papers reflect the state-of-the-art work on this subject.

The guest editors would like to take this opportunity to appreciate all of the authors and the reviewers for their contributions in this issue. Furthermore, the guest editors particularly thank Prof. C.K. Choi (Editor-in-Chief of Wind and Structures) and Dr. J.D. Holmes (former Editor-in-Chief of Wind and Structures) for their kind initiative and guidance of this special issue.

Guest Editors:

Ashraf El Damatty, Professor and Chair,
Department of Civil and Environmental Engineering, The University of Western Ontario, Canada
(damatty@uwo.ca)

Guoqing Huang*, Professor,
School of Civil Engineering, Chongqing University, China
(ghuang1001@gmail.com)