

## Boundary Layer Wind Tunnel Simulation of Transient and Non-synoptic Wind Events

University of Florida NSF NHERI Experimental Facility

Date: Wednesday, May 19, 2021

Time: 10am – 5:30 pm (EDT)

Zoom Link: Will be sent out upon registration

### Overview:

This one-day user workshop will first present the transient and non-synoptic flow simulation capabilities of the boundary layer wind tunnel at the University of Florida NSF NHERI Experimental Facility, enabled by the new Flow Field Modulator (FFM). Invited speakers will then present their active research in transient and non-synoptic flow measurement, modeling, and physical and computational simulation. Through multiple group discussions we seek to develop consensus key science questions that physical simulation facilities may play a role in addressing. Attendees will help define performance benchmarks needed for physical simulation facilities to ensure rigorous and repeatable experimental research in transient and non-synoptic flow simulation and measurement. Follow-up meetings with individuals will initiate research proposals that utilize the University of Florida NHERI Experimental Facility.

### Workshop Goals:

- Present the new simulation capabilities provided by the FFM and discuss limitations
- Establish FFM benchmark datasets and experimental protocols for user proposal preparation
- Publish (on DesignSafe) a workshop report on best practices in transient and non-synoptic event simulation and experimental design
- Generate interest in writing proposals that utilize the FFM, and provide support services

### Agenda

Background and Resources	
Introductions	
10:00 am – 10:10 am	Welcome & Goals for the Day Jennifer Bridge <i>Assoc. Prof. &amp; Director, UF NHERI EF</i>
10:10 am – 10:40 am	Attendee Introductions
UF NHERI Experimental Facility Capabilities	
10:40 am - 11:00 am	EF Overview Jennifer Bridge <i>Assoc. Professor &amp; Director, UF NHERI EF</i>
11:00 am – 11:45 am	Flow Field Modulator: Theory of Operation Ryan Catarelli <i>Research Scientist &amp; Wind Engineering Technical Manager, UF NHERI EF</i>
11:45 am – 12:15 pm	Flow Field Modulator: Capabilities and Benchmarking Brian Phillips <i>Assoc. Professor &amp; Dep. Director, UF NHERI EF</i>
Break (12:15 – 1:00pm)	



Research Planning: Science Themes	
Phenomenology → Target Boundary Layer Characteristics (1-2pm)	
1:00 pm – 1:05 pm	Forrest Masters <i>Professor &amp; Dep. Director, UF NHERI EF</i>
1:05 pm – 1:20 pm	Frank Lombardo <i>Asst. Professor, University of Illinois, Urbana-Champaign</i>
1:20 pm – 1:35 pm	John Schroeder <i>Professor, Texas Tech University</i>
1:35 pm – 2:00 pm	Discussion
Bluff Body Aerodynamics: Kinematic and Dynamic Similitude (2-3pm)	
2:00 pm – 2:05 pm	Forrest Masters <i>Professor &amp; Dep. Director, UF NHERI EF</i>
2:05 pm – 2:20 pm	Fred Haan <i>Professor, Calvin University</i>
2:20 pm – 2:35 pm	Ahsan Kareem <i>Professor, University of Notre Dame</i>
2:35 pm – 3:00 pm	Discussion
Break (3:00 – 3:15 pm)	
Physical Simulation Techniques (3:15-4:15 pm)	
3:15 pm – 3:20 pm	Forrest Masters <i>Professor &amp; Dep. Director, UF NHERI EF</i>
3:20 pm – 3:35 pm	Delong Zuo <i>Assoc. Professor, Texas Tech University</i>
3:35 pm – 3:50 pm	Teng Wu <i>Assoc. Professor, University at Buffalo</i>
3:50 pm – 4:15 pm	Discussion
Computational Wind Engineering Methodologies (4:15-5:15 pm)	
4:15 pm – 4:20 pm	Forrest Masters <i>Professor &amp; Dep. Director, UF NHERI EF</i>
4:20 pm – 4:35 pm	Girma Bitsuamlak <i>Professor, Western University</i>
4:35 pm – 4:50 pm	Catherine Gorle <i>Asst. Professor, Stanford University</i>
4:50 pm – 5:15 pm	Discussion
Workshop Wrap-up (5:15-5:30 pm)	