

Aalborg and surroundings

With its approximately 210,000 inhabitants, Aalborg is the third largest city in Denmark and the capital of the region of northern Jutland. Only 35 kilometres from Aalborg, you will find some of the best and nicest beaches in Europe along the west coast of northern Jutland. In the central section of the city, you find bustling streets and squares, many modern shops, cafés, pavement restaurants and modern coffee bars.



Aalborg University

Aalborg University (AAU) was inaugurated in 1974 and is a well-established research and teaching institution in Denmark offering quite an untraditional range of educational programmes and research in the fields of Humanities, Social Sciences, Engineering and Science, and Medicine. The relatively young Aalborg University differentiates itself from the older and more traditional Danish universities with its focus on interdisciplinary, inter-faculty studies. The real life problem based learning structure is internationally recognized as 'The Aalborg Model'. Aalborg University also greatly emphasizes international relations and cooperation. At present, app. 13% out of a total of 21,600 students are from abroad.

Hotel

Hotel CabInn / www.cabinn.com
Single room: 495 DKK

First Hotel / www.firsthotels.com
Single room: 862,53 DKK

Prinsen Hotel / www.prinsen-hotel.dk/en
Single room: 726,62 DKK

Conference venue

Aalborg University
Fibigerstræde 16
Auditorium 1.108
9220 Aalborg



Summer school website

More information on the summer school and lecture material will be available at the website: www.ISSSD2.aau.dk

Organising committee

Prof. Søren R. K. Nielsen, AAU, Denmark
Prof. Jianbing Chen, Tongji University, China
Prof. Arvid Næss, NTNU, Norway
Prof. Göran Sandberg, Lund University, Sweden



Conference secretariat / Contact

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1st Announcement
March 2014

2nd International Summer School on Stochastic Dynamics of Wind Turbines and Wave Energy Absorbers

Aalborg, Denmark
6-8 August 2014



Introduction

The development of wind energy during the last four decades has primarily been focused on onshore applications. However, the majority of the wind energy production in the next decade is expected to be harvested offshore, providing new technical challenges with respect to foundation problems, dynamic response, structural vibration control, maintenance and surveillance.

Wave energy is less developed. At present, many principles have been suggested and are being tested, without any generally agreed convergence. The constrained optimal control of the power take-off due to saturation of the actuator system and the necessary limitation of the motion of the absorbers is still not solved in a satisfactory way. Many wave energy prototypes have collapsed due to fatigue and extreme loadings. Hence, optimal control and structural reliability play an important role in the further development of this energy resource.

In the summer school, some review and dissemination of the state-of-the-art of these issues will be addressed with emphasis on the stochastic modelling of wave and wind loads and the resulting structural dynamics analysis.

Topics

- Stochastic excitations (wind and wave) on offshore wind turbines and wave energy structures.
- Structural dynamics and vibration control of offshore wind turbine structures and wave energy structures.
- Stochastic dynamics of nonlinear structures.
- Global reliability assessment methods for wind turbines and wave energy structures.

ECTS and course format

This course will entitle PhD students to 2.5 ECTS, corresponding to 67.5-75 hours of work load. The course will consist of 3 full days of lecturers, assignment work and discussions.

Preliminary Schedule

AUGUST 6, 2014

8:00-08:45

Assoc. Prof. Jens Peter Kofoed: *Wave energy. Principles and status of an emerging technology.*

09:00-09:45

Prof. Søren R. K. Nielsen: *Optimal stochastic control of arrays of wave energy point converters.*

10:00-10:45

Prof. Biswajit Basu: *Vibration and power control of wind turbines.*

11:00-12:00

Workshop

13:00-14:45

Prof. Jens Nørkjær Sørensen: *Wake modelling for offshore wind turbine parks.*

15:00-16:45

Assoc. Profs. Kent Persson and Per Erik Austrell: *Simulation and system identification of wind turbines.*

AUGUST 7, 2014

8:00-10:00

Prof. Jie Li: *Physically based modelling of engineering dynamic excitations.*

10:15-12:00

Prof. Jie Li: *Stochastic dynamics and global reliability analysis of wind turbines.*

13:00-14:45

Prof. John Dalsgaard Sørensen: *Reliability of wind turbines and wave energy devices.*

15:00-19:00

Visit to the Danish National Test Center for 6-10 MW wind turbines, Østerild Plantage.

Visit to the Wave Star Wave Energy test facility, Hanstholm Harbour.

20:00-22:00

Dinner at Hanstholm Hotel.

Preliminary schedule—continued

AUGUST 8, 2014

8:00-8:45

Assoc. Prof. Delphine Bard: *Measurement of sound emission and vibration of wind turbines.*

9:00-9:45

? (Lund University): *Societal impact and influence.*

10:00-11:30

Prof. Arvid Næss: *Extreme value distributions for offshore wind turbines.*

13:00-13:45

Assoc. Prof. Michael Muskulus: *Design and Optimization of Floating Offshore Wind Turbines.*

14:00-14:45

Assoc. Prof. Michael Muskulus: *Hydrodynamics and Control of Floaters.*

15:00-15:45

Frank Sandner: *Reduced Order Model of a Floating Wind Turbine.*

Speakers

Prof. Jie Li, Tongji University, China

Prof. Arvid Næss, NTNU, Norway

Prof. Biswajit Basu, Trinity College Dublin, Ireland

Prof. Jens Nørkjær Sørensen, Technical University of Denmark, Denmark

Prof. Søren R. K. Nielsen, AAU, Denmark

Prof. John Dalsgaard Sørensen, AAU, Denmark

Assoc. Prof. Jens Peter Kofoed, AAU, Denmark

Assoc. Prof. Michael Muskulus, NTNU, Norway

Assoc. Prof. Kent Persson, Lund University, Sweden

Assoc. Prof. Per Erik Austrell, Lund University, Sweden

Assoc. Prof. Delphine Bard, Lund University, Sweden

Frank Sandner, University of Stuttgart, Germany

Registration

FEE: Early 800 DKK / Registration 1000 DKK

IMPORTANT DATES:

Early registration deadline — May 23, 2014

Registration deadline — July 1, 2014

REGISTER: abl@civil.aau.dk (opens March 10, 2014)