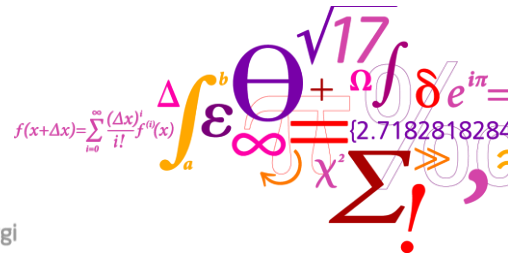




HAWC2 – Course Introduction

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Time Schedule

Time Schedule	
	Morning
Monday, 12/3	<ul style="list-style-type: none"> • Introduction (AY, TJ) • Structural modeling and implementation in HAWC2 (TK)
Tuesday, 13/3	<ul style="list-style-type: none"> • Hydrodynamics and wave kinematics module (TJ) • Floating structures and mooring lines (TJ)
Wednesday, 14/3	<ul style="list-style-type: none"> • Trailing edge flaps (LB) • Wake loads (HM)



What is the HAWC2 code?

A tool for simulation of wind turbine response in time domain with following properties:

- Normal onshore with 1,2, 3 or multiple blades
- Pitch and (active) stall controlled wind turbines
- Guyed support structures
- Offshore turbines on monopoles, tripods or jackets
- Floating turbines with mooring lines
- Multiple rotors in one simulation
- Structural core based on a multibody formulation that can handle multiple degrees of freedom (like blade torsion)
- Detailed aerodynamic model based on BEM that includes:
 - Two dynamic stall models: Stig Øye model and a modified Beddoes-leishmann model
 - Skew inflow model
 - Shear effects on the induction
 - Dynamic inflow model
 - Tiploss

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Anders Yde 03-oct-2011



- Hydrodynamic model based on Morrison's equation
- Water Kinematics that includes:
 - Currents
 - Linear airy waves
 - Irregular airy waves
 - Deterministic irregular waves
- Wind, turbulence and wake models:
 - Build-in Mann turbulence generator (Fully coherent 3D-turbulence)
 - Able to read Veers turbulence model (used in FLEX5)
 - Dynamic wake meandering model for turbines in wakes
- Control interface preformed through DLL's (Dynamic Link Library)
- Default controller provided with a pitchregulated variable speed controller
- Soil module consisting of a set of spring-damper forces attached to a main body.
- Excel spreadsheet macros for automatic input file creation – coupled to a distributed computing tool.
- Time domain simulations is the primary output, however eigenvalues can be calculated at stand still.

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Installation of the program

Name	Date modified	Type	Size
animation	30-09-2011 08:20	File folder	
control	30-09-2011 08:20	File folder	
data	30-09-2011 08:20	File folder	
eigenfrq	25-08-2011 11:22	File folder	
htc	30-09-2011 08:20	File folder	
log	30-09-2011 08:20	File folder	
res	30-09-2011 08:20	File folder	
turb	30-09-2011 08:20	File folder	
manual_version_4-0.pdf	12-07-2011 12:39	Adobe Acrobat D...	1.053 KB
Animation.exe	21-09-2008 09:54	Application	1.825 KB
get_mac_adresses.exe	27-09-2010 11:01	Application	364 KB
hawc2MB.exe	17-05-2011 10:52	Application	3.244 KB
WINDAP.exe	16-11-2006 16:03	Application	1.208 KB
ainslie_15.dll	04-12-2009 23:47	DLL File	32 KB
DFORMDD.DLL	20-06-2001 03:11	DLL File	448 KB
DFORMDD.DLL	20-06-2001 03:11	DLL File	448 KB
DFORRT.DLL	20-06-2001 03:10	DLL File	440 KB
DFORRTD.DLL	20-06-2001 03:10	DLL File	440 KB
licence_manager.dll	27-09-2010 11:18	DLL File	424 KB
Mann.dll	10-06-2009 15:30	DLL File	97 KB
MSVCRTD.DLL	07-03-2000 00:00	DLL File	425 KB
wkin_dll.dll	07-05-2009 14:48	DLL File	144 KB
Hawc2Bat.BAT	07-04-2011 13:57	Windows Batch File	1 KB
start_dos.bat	30-09-2010 17:39	Windows Batch File	1 KB



The license manager DLL

- Execute the small program: GET_MAC_ADRESSES.exe

```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

S:\AED\HAWC2\HAWC2MB_exe\ALL_YOU_NEED_IN_THE_HAWC2_directory>get_mac_adresses
Risø-DTU software for extracting MAC addresses
Torben J. Larsen 21. oct. 2008
Found MAC addresses are written in the file: LP-12759.mac
00-1F-3B-D9-30-19
00-1C-23-4F-EB-2A
00-1E-37-EC-EF-B5

S:\AED\HAWC2\HAWC2MB_exe\ALL_YOU_NEED_IN_THE_HAWC2_directory>_

```

- Open file *.mac and write you name, e-mail and duration of license
- I need the *.mac output file: In this case LP-12759.mac



License manager

- When properly installed the HAWC2 answer to execution should be like this:

A screenshot of a Windows command prompt window. The title bar reads 'C:\WINDOWS\system32\cmd.exe'. The window content shows the following text:

```
Microsoft Windows XP [Version 5.1.2600]  
(C) Copyright 1985-2001 Microsoft Corp.  
  
c:\Risoe\Undervisning\HAWC2_course_2009\hawc2_model>hawc2MB.exe  
HAWC2MB version: HAWC2MB 8.2  
License verified - OK  
Wrong number of arguments: Usage: <exe file> <htc file>  
c:\Risoe\Undervisning\HAWC2_course_2009\hawc2_model>
```