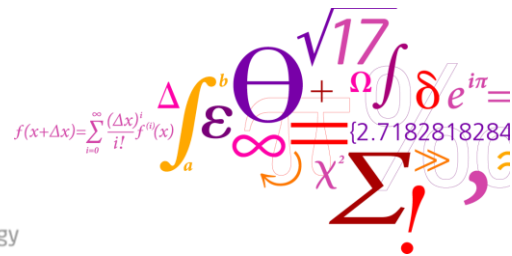
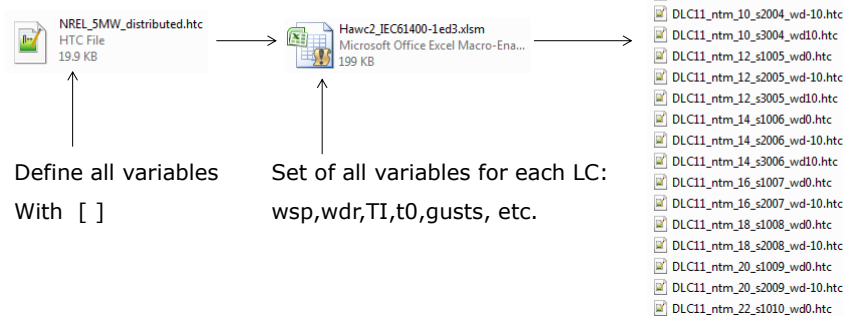


Load case implementation and Autogeneration of inputfiles



Risø DTU
National Laboratory for Sustainable Energy

Autogeneration of inputfiles



Excel Spreadsheet

animation	08-11-2012 10:20	File folder	GenHtc	11-11-2012 23:45
control_nrel	08-11-2012 10:21	File folder	iec_htc	08-03-2012 10:21
control_riseo	08-11-2012 10:21	File folder	iec_htc_master	07-11-2012 16:18
data	08-11-2012 10:21	File folder	iec_logfiles	08-03-2012 10:20
eigenfreq	12-11-2012 11:42	File folder	iec_res	08-03-2012 10:21
htc	12-11-2012 00:34	File folder	iec_turb	08-03-2012 10:19
htc_hydro	08-11-2012 10:21	File folder	Hawc2_IEC61400-1ed3.xlsm	09-11-2012 09:39
logfiles	12-11-2012 00:34	File folder		
res	12-11-2012 00:34	File folder		
simulation_iec	12-11-2012 01:08	File folder		
tools	11-11-2012 21:04	File folder		
turb	08-11-2012 10:21	File folder		
ainslie_16.dll	17-01-2011 14:35	DLL File		
ainslie_17.dll	21-12-2011 10:48	DLL File		
Animation.exe	19-05-2011 11:26	Application		
Animation_commands.txt	11-03-2012 16:25	Text File		

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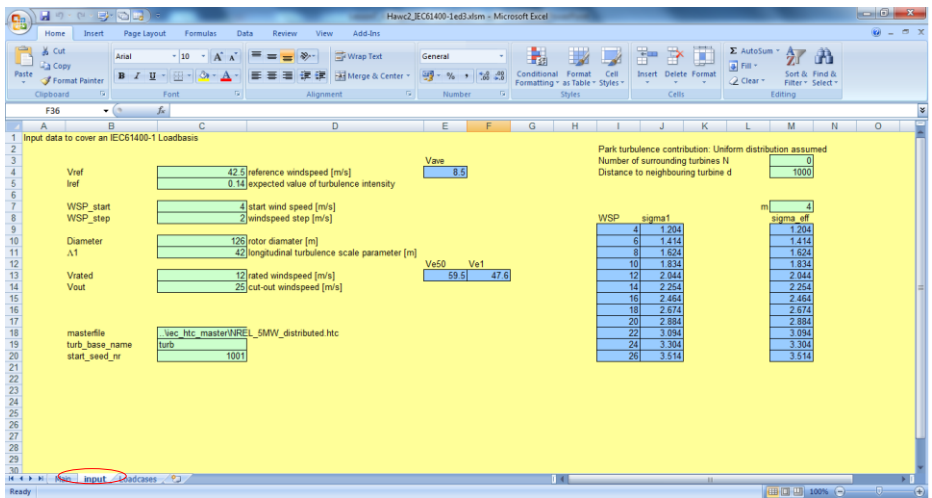
Spreadsheet input 1

Main data for HAWC calculation	
Path to master folder	C:\Users\jand\Desktop\Projects\HAWC2_undervisning\Nov 2012\Hawc2_model_to_distribute\simulation_iec1
Master folder	
Model rar file	Not used for local application
Prefix	Not used for local application
Name of htc folder	iec_htc
Name of turbulence folder	iec_turb
Name of wake turbulence folder	
Name of meander turbulence folder	
Name of result directory folder	iec_res
Name of log folder	iec_logfiles
HAWC version	HAWC2MB
user initials	user_init
Problem	Not used for local application
Path to Probob	Not used for local application
Copy Back turbulence	1=copy back, 0=don't
IEC folder	simulation_iec/
Do not use the danish letters æ, å & ð in the input data	
Do not use blank characters in file of directory names	
All directories including empty(htc,turb,res,logfiles) must be present in the packed rar file	

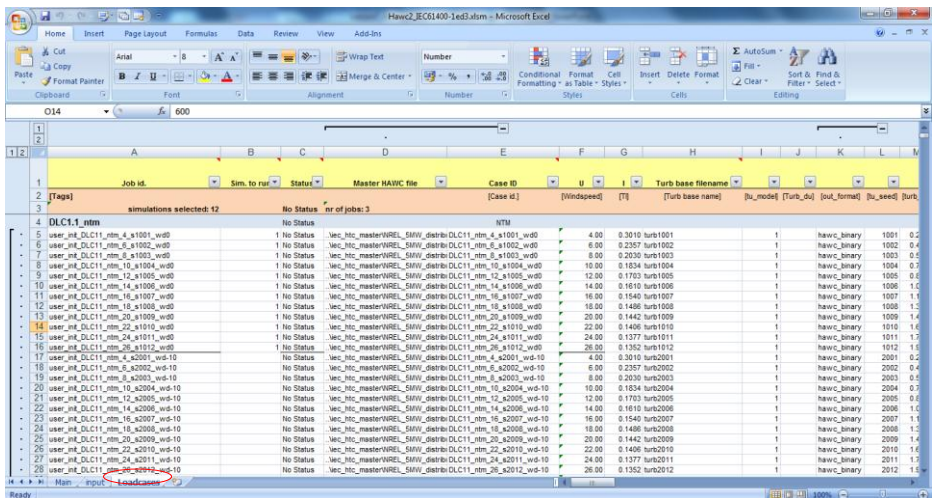
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Spreadsheet input 2



Spreadsheet input 3



The format for the master.htc file



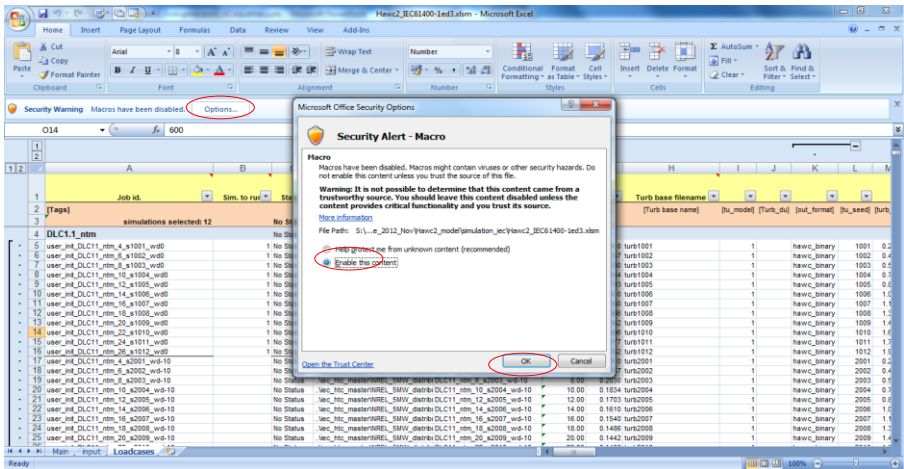
```
begin Simulation;
  time_stop (time stop);
  solvetype 1 ; (newmark)
  on_no_convergence continue ;
  convergence_limits 1E3 1.0 0.7 ;
  logfile ./simulation_iec/iec_logfiles/(Case id).log ;
  animation ./iec_animation/(Case id).dat;
;
begin newmark;
  deltat 0.02;
end newmark;
end simulation;

begin new_htc_structure;
; beam_output_file_name ./simulation_iec/iec_logfiles/(Case id).beam.dat; Optional - Calculated beam properties of the bodies are written to file
; body_output_file_name ./simulation_iec/iec_logfiles/(Case id).body.dat; Optional - Body initial position and orientation are written to file
; body_eigenanalysis_file_name ./simulation_iec/iec_eigenfrq/(Case id).body_eigen.dat;
; structure_eigenanalysis_file_name ./simulation_iec/iec_eigenfrq/(Case id).strc_eigen.dat;
;
begin main_body; tower 87m
  name tower ;
  type timoschenko ;
  nbodies 1 ;
  node_distribution c2_def ;
  damping_posdef 8.142E-04 8.14E-04 4.0E-03 4.3E-04 4.3E-04 4.3E-03 ; Nx My Mz Kx Ky Kz , N's raises overall level, K's raises high frequency level
  begin timoschenko_input;
    filename ./data/NREI_SMM_st.txt ;
    set 1 1 ;
  end timoschenko_input;
  begin c2_def; Definition of centerline (main_body coordinates)
```

Generation of HTC's & Bat file



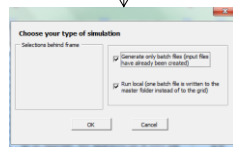
-Enable macros!



Generation of HTC's & Bat file

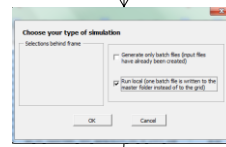


Job id.	Sim. to run	Status	Master HAWC file	Case id.	Turb base filename	Turb base name	Turb. base	Turb. base	Turb. base	Turb. base
1	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
2	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
3	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
4	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
5	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
6	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
7	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
8	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
9	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
10	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
11	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2
12	No	No Status	No	1	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2	Hawc2



Hawc2.BAT

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DLC11_ntm_4_s1001_wd0.htc
DLC11_ntm_4_s2001_wd-10.htc
DLC11_ntm_4_s3001_wd10.htc
DLC11_ntm_6_s1002_wd0.htc
DLC11_ntm_6_s2002_wd-10.htc

9

HAWC2.Bat-file



Name	Date modified
GenHtc	12-11-2012 00:34
iec_htc	08-11-2012 15:02
iec_htc_master	08-11-2012 16:42
iec_logfiles	08-11-2012 19:21
iec_res	12-11-2012 03:15
iec_turb	08-11-2012 19:24
Hawc2_JEC61400-1ed3.xlsx	09-11-2012 09:39
Hawc2.BAT	12-11-2012 01:08

Overnight simulations? Add "shutdown -s" in the end of your .bat-file to power off the computer after the simulation is finished

```
Hawc2Bat.BAT
1 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_4_s1001_wd0.htc
2 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_6_s1002_wd0.htc
3 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_8_s1003_wd0.htc
4 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_10_s1004_wd0.htc
5 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_12_s1005_wd0.htc
6 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_14_s1006_wd0.htc
7 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_16_s1007_wd0.htc
8 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_18_s1008_wd0.htc
9 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_20_s1009_wd0.htc
10 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_22_s1010_wd0.htc
11 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_24_s1011_wd0.htc
12 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_26_s1012_wd0.htc
13 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_4_s2001_wd-10.htc
14 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_6_s2002_wd-10.htc
15 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_8_s2003_wd-10.htc
16 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_10_s2004_wd-10.htc
17 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_12_s2005_wd-10.htc
18 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_14_s2006_wd-10.htc
19 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_16_s2007_wd-10.htc
20 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_18_s2008_wd-10.htc
21 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_20_s2009_wd-10.htc
22 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_22_s2010_wd-10.htc
23 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_24_s2011_wd-10.htc
24 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_26_s2012_wd-10.htc
25 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_4_s3001_wd10.htc
26 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_6_s3002_wd10.htc
27 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_8_s3003_wd10.htc
28 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_10_s3004_wd10.htc
29 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_12_s3005_wd10.htc
30 HAWC2MS ./simulation_iec/iec_htc/DLC11_ntm_14_s3006_wd10.htc
31
```

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Parallel computing



PC

Hawc2_model_1
Hawc2_model_2
Hawc2_model_3
Hawc2_model_4
2-4 cores

Remember to run in parallel
Folders!



Super computer

Hawc2_model_1
Hawc2_model_2
Hawc2_model_3
Hawc2_model_4
Hawc2_model_5
Hawc2_model_6
Hawc2_model_7
Hawc2_model_8
Hawc2_model_9
100-10000 cores

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Quick guide

1. Sheet: Main



- Enable macros
- Setup of folder names to match your (

2. Sheet: input

If covering the IEC61400-1 Load basis insert all values in the green cells from the standard.

3. Sheet: Loadcases

Check all inputs and if you wish to remove any load cases clear the cells in row "Sim. to run".

- Generate .bat-file: ->Click  -> check both boxes ->"ok".
- Gnerate all HTC-input files : ->Click  -> check last box ->"ok".

- remember to set decimal symbol to . in Windows (Control Panel\Clock, Language, and Region\Change the date, time, or number format\Format\additional settings)

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Exercise


• Ex1 Generate HTC & Bat - files

- Generate all the HTC-files from the load case spreadsheet
- Check some of HTC-files and see if the right values are inserted?
- Run a load case in HAWC2:
 - Start command prompt in main folder and write: hawc2mb \simulation_iec\iec_htc\loadcase name" or tab to browse files
- Make initial assessments of the results using windap, does the results make sense?

• Ex2 Run a bat file

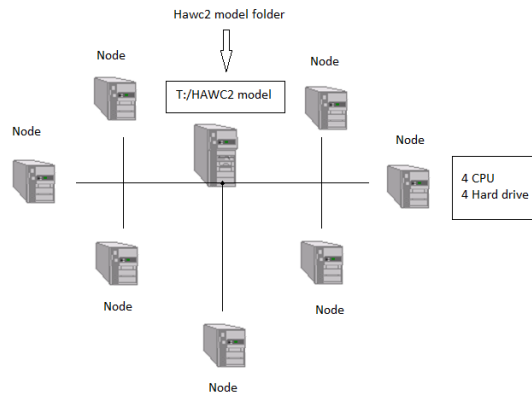
- Create a bat-file containing the 5 first loadcases and run it in HAWC2.
- (move the bat-file to the main folder)
- > to run a bat-file: Start command prompt and write "name of bat-file"
- Compare results using Windap or MATLAB, e.x. plot standard deviation of blade root bending moment as a function of wind speed

Ex3 – Create a set of loadcases

- Go to simulation_iec -> GenHtc ->  Gen_htc.xlsm
Microsoft Office Excel Macro-Ena...
244 KB
- Create a set of loadcases with the following properties:

Load Case	Enabled DOF	Wind Conditions	Initial Conditions	duration
1.1	None	No air	Omega=0 rad/s	300 s
1.2	All	8 m/s	Omega=0.2 rad/s	400 s
1.3	All	12 m/s	Omega=0.5 rad/s	500 s
1.2	None	12 m/s	Omega=0.5 rad/s	500 s

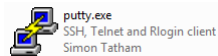
Running HAWC2 on a cluster (thyra)



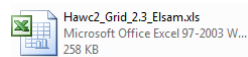
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Running HAWC2 on a cluster (thyra)

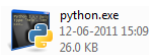
TPB (thyra parallel Batch)



Excel spread sheet



Python script



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TPB (thyra parallel Batch)

1. Get acces to thyra (mail to Anne Margrethe Larsen [anla@risoe.dtu.dk])
2. Copy your hawc2 folder with .bat file to thyra (clean all output folders)
-remember to add "wine" when running on thyra (for linux applications)
3. Setup the input file (.txt) with all folders and informations etc.
4. Start putty.exe and login to thyra
5. Set up the folder to your input file (cd Hawc2)
6. Enter the inputfile

-status on all jobs : "qstat"
-status on your jobs : "qstat -u initials"
-delete a job: "qdel [job id]"

- Good practice: don't occupy the entire cluster!!