MATLAB Wave Tank Functions Reference

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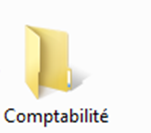
[plot 13](#_Toc412102515)

[plotn 13](#_Toc412102516)

# Data Organisation

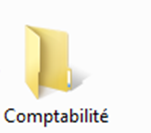
## Folders

Project folder



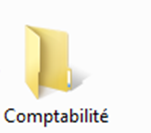
Marinet

(project folder)



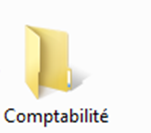
Meas

(measurements folder)



Fig

(figures folder)



Res

(results folder)



Marinet\_001.txt

Marinet\_002.txt

Marinet\_003.txt

…



Marinet\_001\_Time\_Series.pdf

Marinet\_001\_Ana\_Freq.pdf

Marinet\_002\_Time\_Series.pdf

…

Marinet\_001.mat

Marinet\_002.mat

Marinet\_003.mat

…



## The testMatrix.xls file

### Onglet “testList”

Le tableau doit avoir les colonnes décrites ci-dessous :

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Num essai | Date | Heure | Type | Tdeb | Tfin | Fichier consigne | H (cm) | T (s) | Gamma | Observation |
| 1 | 30/10/2014 | 12h14 | 1 | 35 | 105 |  | 20 | 2.2 |  | Ok |
| 2 | 30/10/2014 | 13h46 | 1 | 40 | 110 |  | 20 | 2.5 |  | Ok |
| 3 | 30/10/2014 | 14h09 | 2 | 40 | 550 |  | 15 | 2.2 | 3.3 | Ok |
| 4 | 30/10/2014 | 14h31 | 3 | 35 | 55 |  |  |  |  | decay test pitch |
| 5 | 30/10/2014 | 14h48 | 3 | 35 | 55 |  |  |  |  | decay test pitch |
| 6 | 30/10/2014 | 15h02 | 4 | 35 | 55 |  |  |  |  | Tracking problem |

### Onglet “ChannelList”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Channel | Nom voie | Unité | Groupes Tempo | Groupes Freq | Groupes FoncTrans |
| 1 | Waves | mm | 1 | 1 |  |
| 2 | Wind\_U | m/s | 1 |  |  |
| 3 | Wind\_V | m/s | 1 |  |  |
| 4 | Wind\_W | m/s | 1 |  |  |
| 5 | Wind\_Status | TOR |  |  |  |
| 6 | MooringLine | Newton | 1 | 1 | 1 |
| 7 | X | mm | 2 | 1 | 1 |
| 8 | Y | mm | 2 |  |  |
| 9 | Z | mm | 2 | 1 | 1 |
| 10 | Yaw | deg | 2 |  | 1 |
| 11 | Pitch | deg | 2 | 1 | 1 |
| T,12 | Roll | deg | 2 |  |  |
| 13 | Residual | mm |  |  |  |
|  |  |  |  |  |  |

# Project Class description

## project

Create an object of class project which fields are:

* name : project name
* path : project path where all the files and folders are
* pathMeas : folder where all measurement files are
* pathRes : folder where all the results files are
* pathFig : folder where all the Figures are
* testList : cell array containing all the measurement files names.
* testNb : number of measurement files
* testPlan : content of the testMatrix.xlsx file
* paramNames :celle array with the parameters names.

Syntax

p = project()

p2 = project(p1)

p = project(name, path)

Description

p = project() returns a project object p with the properties set to default values

p2 = project(p1) returns a project object p2 with the ame properties than project object p1.

p = project(name, path) returns a project object p. It checks if the folders Meas, Fig and Res exist. The names of the measurement files contained in the Meas folder are stored in testList and the number of file is stored in testNum .The testMatrix.xlsx file is read, the lines with no tests are deleted. The numerical data goes in testPlan and the text data goes in paramNames.

## get

Get properties from the specified object and return the value.

Syntax

val = get(a, propName)

Properties list

* name
* path
* pathMeas
* pathRes
* pathFig
* fileList
* fileNb
* testPlan
* paramNames
* parameters

## display

displays properties of the object

syntax

display(p)

Description

Displays the name of the project, the paths and the number of measurement files

## plotTempSeries

This function plots the measurement signals of a specified test in the project.

Syntax

PlotTempSeries(proj, numTest)

PlotTempSeries(proj,numTest,printPdf)

Description

PlotTempSeries(proj, numTest) plots the measurement signal according to the defined sugnal groups in the testMatrix.xlsx file.

PlotTempSeries(proj,numTest,printPdf)plots the measurement signal according to the defined sugnal groups in the testMatrix.xlsx file and print the figure as a pdf document in the Fig folder.

# Test Class Description

## test

TEST class constructor.

create an object of class TEST which fields are

- p : the project from which it inherits the fields and methods

- num : the number of the test

- fileMeas : the corresponding measurement file (path+ name)

- fileRes : the corresponding results file (path+name) binary matlab file

- channelNames{} : name of each measurement channel

- channelUnits{} : unit of each measurement channel

- channelGroups : define the groups of channels to be displayed together

- channelGroupsFreq : define the groups of channels to be displayed together on frequency analysis boards

Syntax

Syntax

t = test()

t2 = test(p2)

t = test(project, number)

Description

t = test() returns a test object t with the properties set to default values

t2 = test(p2) returns a test object t2 with the same properties than test object t1.

t = test(proj, num)returns a test object t corresponding to the test number “num” in the project “proj”.

## get

Get properties from the specified object and return the value.

Syntax

val = get(a, propName)

Properties list

* num
* fileMeas
* fileRes
* channelNames
* channelUnits
* channelGroups
* param : parameter associated to the test

and the properties inherited from the project class :

* name
* path
* pathMeas
* pathRes
* pathFig
* fileList
* fileNb
* testPlan
* paramNames
* parameters

## display

displays properties of the object

syntax

display(p)

Description

Displays the tes number, the name of the project, measurement file name and the results file name, the channels, the test parameters.

## TESTSerFour

Calculate the Fourier series coefficients for each signal channel of the test

syntax

TESTSerFour(test,Nf)

Description

TESTSerFour(test,Nf)create a signal object for each measurement channel and calculates the Fourier series coefficients at order Nfusing the SIGSerFour functions (see Signal Class).

The time interval for data analysis and the theoretical period are read in the testMatrix.xlsx file.

## TESTTransFour

Calculate the Fourier series coefficients for each signal channel of the test

syntax

TESTTransFour(test,Nf)

Description

TESTTransFour(test,Nf) create a signal object for each measurement channel and calculates the Fourier series coefficients at order Nf using the SIGSerFour functions (see Signal Class).

The time interval for data analysis and the theoretical period are read in the testMatrix.xlsx file.

**Signal Class Description**

**signal**

SIGNAL signal class constructor,

Creates a signal object which properties are

- Y signal vector

-dt : sampling period

- name: name of the signal

- unit :physical unit of the signal

**Syntax**

s = signal(Y,dt,name,unit)

s = signal(file,numcol,name,unit)

s=signal(test,channelnumber)

s=signal(test,channelname)

**Description**

s = signal(Y,dt,name,unit) returns a signal object with the properties Y, dt, name and unit.

s = signal(fichier,numcol,name,unit) returns a signal object corresponding to the column “numcol” in the file “file” with name and unit.

s=signal(test,channelnumber) returns a signal object loaded from a test object “test” at the channel number “channelnumber”.

s=signal(test,channelname) returns a signal object loaded from a test object “test” at the channel called “channelname”.

## get

Get properties from the specified object and return the value.

Syntax

val = get(a, propName)

Properties list

* nom
* unite
* dt
* Y

## display

displays properties of the object

syntax

display(p)

Description

Displays the signal name, unit, dt, number of points.

## SIGcut

displays properties of the object

syntax

val = SIGcut(s,tdeb,tfin)

Description

Cuts the signal between the time teb and tfin specified in seconds and returns the new signal

in object val

## plot

Opens a figure and plot the signal

syntax

plot(signal)

Description

Opens a figure and plot the signal.

## plotn

Opens a figure and plot a set of signals

syntax

plot([signalVector])

Description

Opens a figure and plot the signals contained in signalVector.

**SIGSerFour**

SERFOUR calcule les coefficients des séries de Fourier du signal s de fréquence théorique Ttheo à l'ordre n dans l'intervalle tdeb, tfin.

Syntax

val = SIGSerFour(s,ordre,tdeb,tfin,Ttheo)

Description

Calcule les séries deFourier du signal s, à l’ordre « ordre », de tdeb à tfin à la fréquence théorique Tthéo.

Il renvoie un tableau contenant :

1ere colonne : vecteur fréquences

2e colonne : vecteur module des coef de Four

3e colonne : vecteur phase des coef de Four

**SIGTransFour**

Calcule la transformée de Fourier du signal s

Syntax

val = SIGTransFour(s,offset,tdeb,tfin)

val = SIGTransFour(s,offset,tdeb,tfin,Theo)

Description

Il renvoie un tableau contenant :

- le vecteur colonne frequences

- le vecteur colonne module de la trans de Fourier

- le vecteur colonne phase de la trans de Fourier

- le vecteur colonne DSP