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| **C:\Users\sjamet\Documents\Logo LHEEA-CNRS.png** |  |

**Wave Generation Report**

**Target waves and measured waves**

**LHEEA team**

May 2018

**SOMMAIRE**

Contenu

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# 1 Summary

This report gives all the details on wave generation for a specific campaign

# 1 Marinet2 OSCILLA campaign

# Test Plan

## Regular waves

Specifications for regular wave generation.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Scale Factor: | 10 |  |  |  |  |  |  |  |
| Waves | | | Full Scale | | | Model Scale | | |
| Case | Location | | H | T | Vw | H (mm) | T | Vw |
| WC-R1 | - | | 0.3 | 3 | - | 30 | 0.9 | - |
| WC-R2 | - | | 0.3 | 4 | - | 30 | 1.3 | - |
| WC-R3 | - | | 0.5 | 5 | - | 50 | 1.6 | - |
| WC-R4 | - | | 0.5 | 6 | - | 50 | 1.9 | - |
| WC-R5 | - | | 0.5 | 8 | - | 50 | 2.5 | - |
| WC-R6 | - | | 1 | 10 | - | 100 | 3.2 | - |
| WC-R7 | - | | 1 | 14 | - | 100 | 4.4 | - |
| WC-R8 | - | | 1 | 16 | - | 100 | 5.1 | - |

## Long-crested (uni-directional) irregular waves

Specifications for irregular waves: Bretschneider spectra

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Scale Factor: | 10 |  |  |  |  |  |  |  |
| Waves | | | Full Scale | | | Model Scale | | |
| Case | | Location | Hs | Tp | Vw | Hs (mm) | Tp | Phase sets |
| WC-LC1 | | - | 0.75 | 4.5 | - | 75 | 1.4 | 1 |
| WC-LC2 | | - | 0.75 | 10.5 | - | 75 | 3.3 | 1 |
| WC-LC3 | | - | 1.75 | 5.5 | - | 175 | 1.7 | 1 |
| WC-LC4 | | - | 1.75 | 9.5 | - | 175 | 3.0 | 1 |
| WC-LC5 | | - | 1.75 | 13.5 |  | 175 | 4.3 | 1 |
| WC-LC6 | | - | 3.75 | 8.5 | - | 375 | 2.7 | 1 |
| WC-LC7 | | - | 4.8 | 8 | - | 480 | 2.5 | 3 |

## Short-crested irregular waves

Specifications for irregular waves: Bretschneider spectra

Directional spreading in for with

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Scale Factor: | 10 |  |  |  |  |  |  |  |
| Waves | | | Full Scale | | | Model Scale | | |
| Case | | Location | Hs | Tp | Vw | Hs (mm) | Tp | Vw |
| WC-SC1 | | - | 0.75 | 4.5 | - | 75 | 1.4 | - |
| WC-SC2 | | - | 0.75 | 10.5 | - | 75 | 3.3 | - |

# Frequency wave spectra

From previous spectrum specifications, wave components are considered only when

* they fit into the wavemaker frequency range [0 ; 2] Hz
* they corresponds to energy above 1% of the energy at the peak of the spectrum

With these simple rules, energy is generated within 3% of the input spectrum. The target energy spectrum and amplitude distribution are given in



Figure Normalized energy spectrum (left) and amplitude distribution (right)

# Directional Wave spectra

## Available spreadings

The wavemaker at LHEEA has the following library of directional spreading

* for
* for

## spreading

The first one is plotted for a mean direction and for the following values of the n parameter: 5, 10 and 15.



Figure 2 Directional spreading for various values of the n parameter

## spreading

The second one is plotted for a mean direction and for the following values of the s parameter: 10, 20 to 50.



Figure 3 Directional spreading for various values of the s parameter

## Width of the directional distribution

The directional spreading may be estimated by the Half Width at Half Maximum. Most of the generated waves directions are contained within the range . The values are reported in the following table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| s coefficient | 10 | 20 | 30 | 40 | 50 |
| HWHM in degrees | 30 | 21 | 17 | 15 | 13 |
| n coefficient | 5 | 10 | 15 | 20 | 25 |

## Equivalence

The distribution is the same as the when we take , as long as is not too small.

# Calibration certificates

## Wave gauges