

## SECOND POST!

✓ Airy and Stokes 5Th: Equivalent wave to Jonswap.

✓  $H = 1.86 \times H_s$



Line 02

Wave



AAJL Engenharia

## THE INFLUENCE OF THE MAIN WAVE TYPES IN OFFSHORE STRUCTURES RESPONSES - EQUIVALENT REGULAR WAVE

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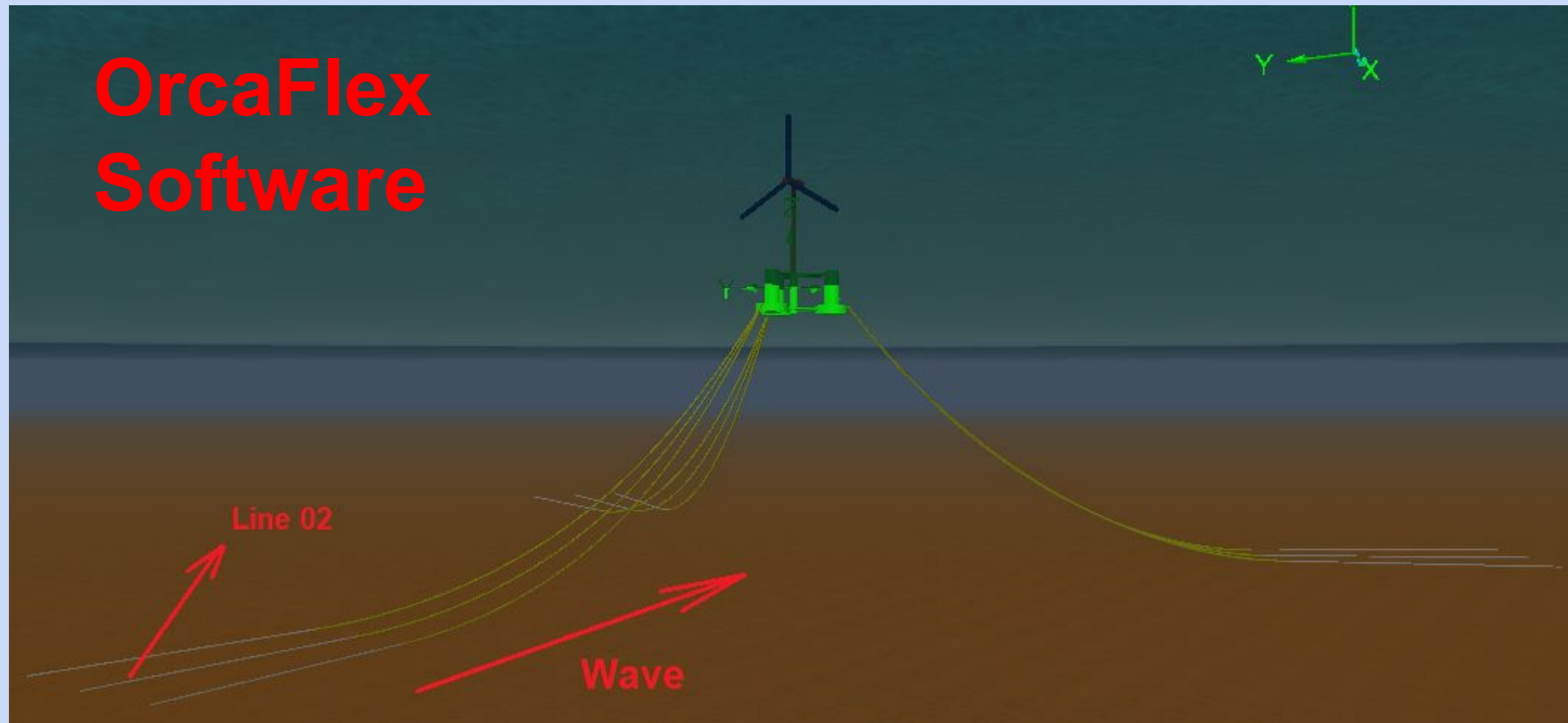
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**Airy - Stokes 5Th - Jonswap**



## Offshore Wind Turbine



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## Main Data:

- ✓ Airy and Stokes 5Th: Equivalent wave to Jonswap.
- ✓  $H = 1.86 \times H_s$  [1].

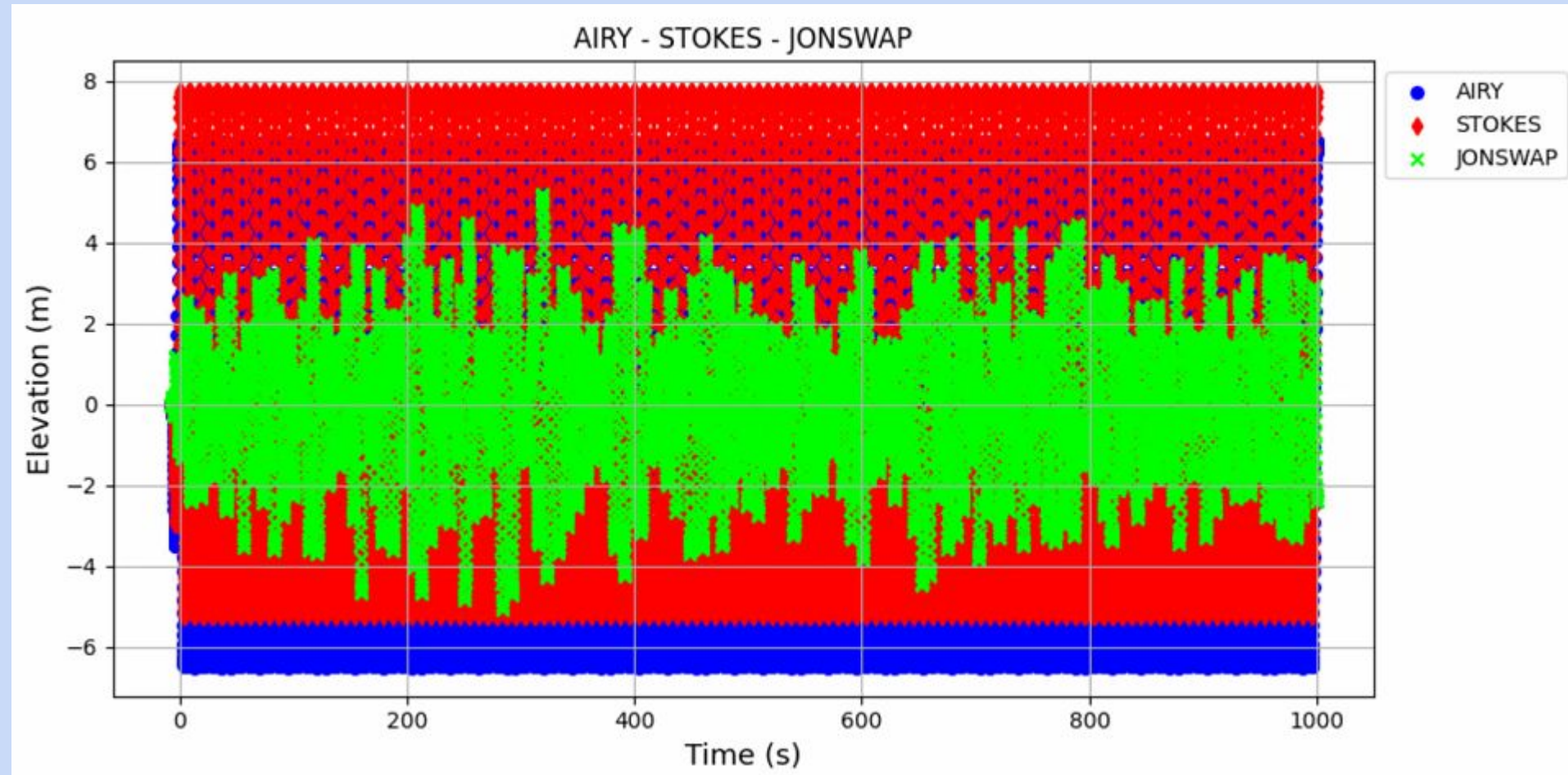
### Campos Basin: Brazil.

Water Depth (m)	200
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Wave Types					
Airy		Stokes 5Th		Jonswap Spectrum	
H (m)	13.02	H (m)	13.02	H <sub>s</sub> (m)	7.00
T (s)	8.33	T (s)	8.33	T <sub>p</sub> (s)	8.33

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## Wave Elevation:

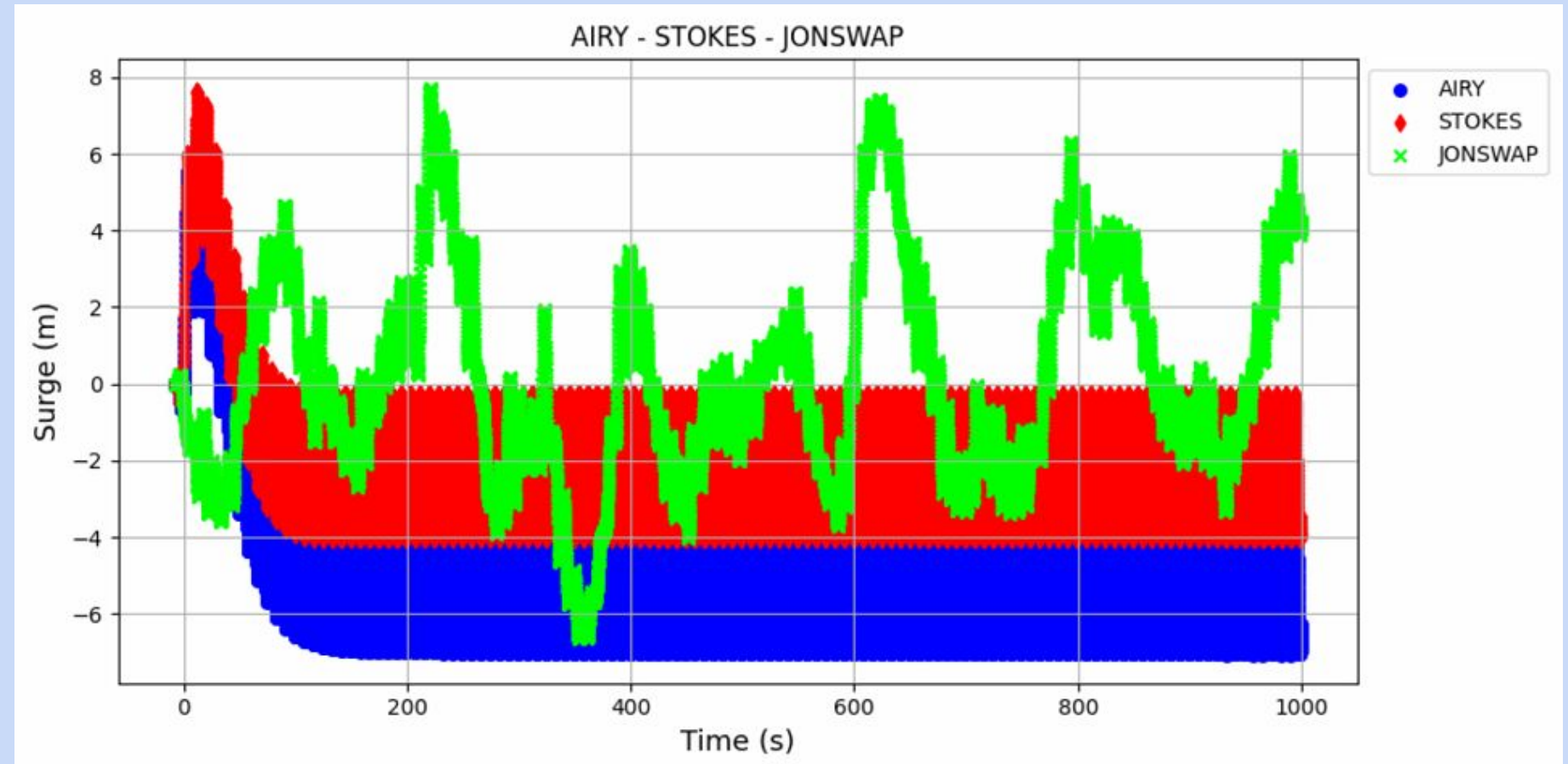


- ✓ Values of elevation for Airy (Blue) and Stokes 5Th (Red) were very close.



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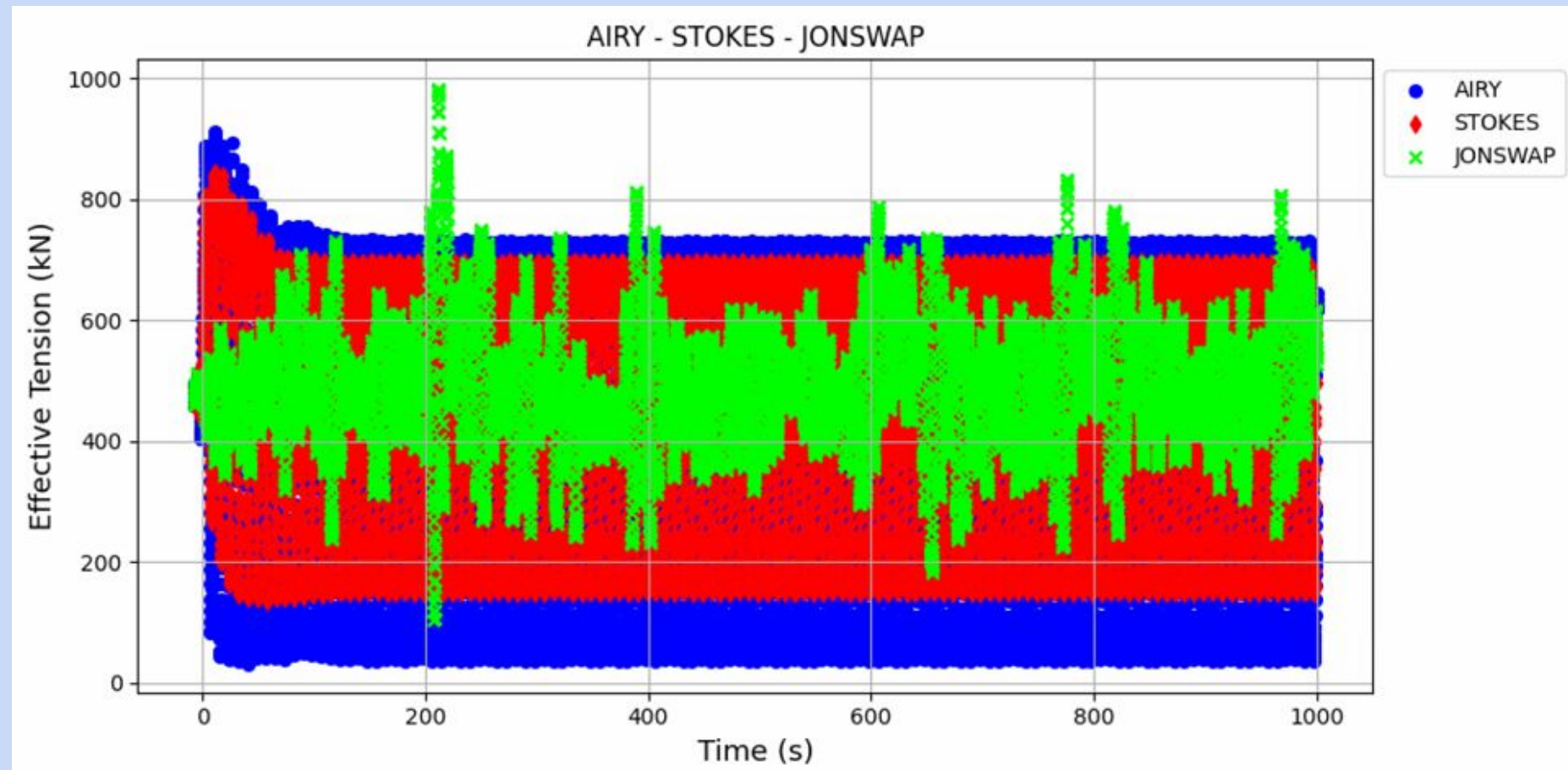
## Platform Surge:



- ✓ The surge response for Airy (Blue) and Stokes 5Th (Red) were very close, only with a dephased answer.
- ✓ For the Jonswap (Green), it can be seen that it presented greater values than Airy and Stokes.

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## Effective Tension at top of the Line 02 (Slide 02):



- ✓ With respect the effective tension, for Airy (Blue), it can be observed that the responses were greater than the Stokes 5Th (Red). However, the Jonswap spectrum (Green) presented peaks of responses in specific points of the time serie higher than Airy and Stokes.

## Conclusion:

- ✓ It is important to highlight that the present study is a simple work and valid only for the system regarded.
- ✓ The study showed that it is important to take care with the values of effective tension, for Jonswap spectrum, once peaks of values greater than Airy and Stokes were observed in specific points of the time series, even regarding the procedure of regular wave (Airy and Stokes) equivalent to irregular (Jonswap), equivalent wave energy.



## Reference:

**[1] Gudmestad O. T., Viddal S., Safe procedures for personnel-transfer from a vessel to an offshore floating wind turbine. Western Norway University of Applied Sciences, 2021.**