Analysis and modelling tools for ocean energy – Flap Type Arrays

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QUEEN'S UNIVERSITY BELFAST

Funded by the European Union

ONDEP

- 14 project partners
- AW Energy's Wave Roller technology
- 4 device array to be deployed in Peniche, Portugal
- www.ondep-wave.eu

Array Optimisation

- Operational limits, cables, bathymetry, EI

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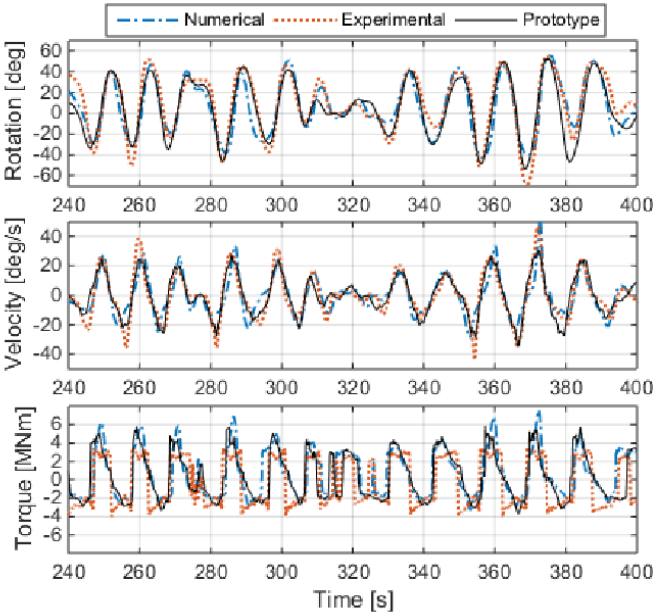
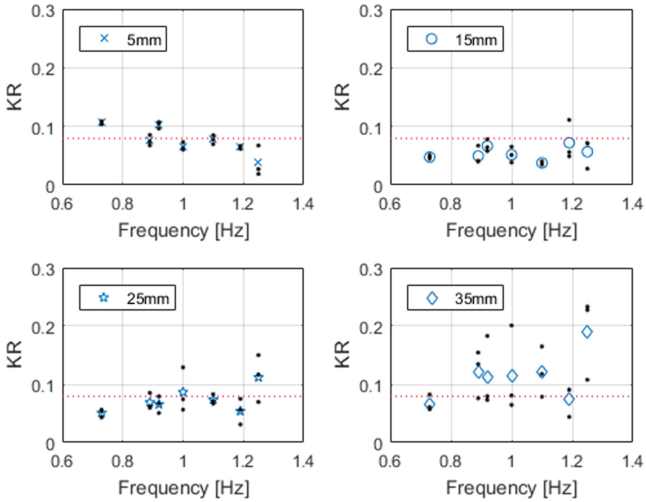
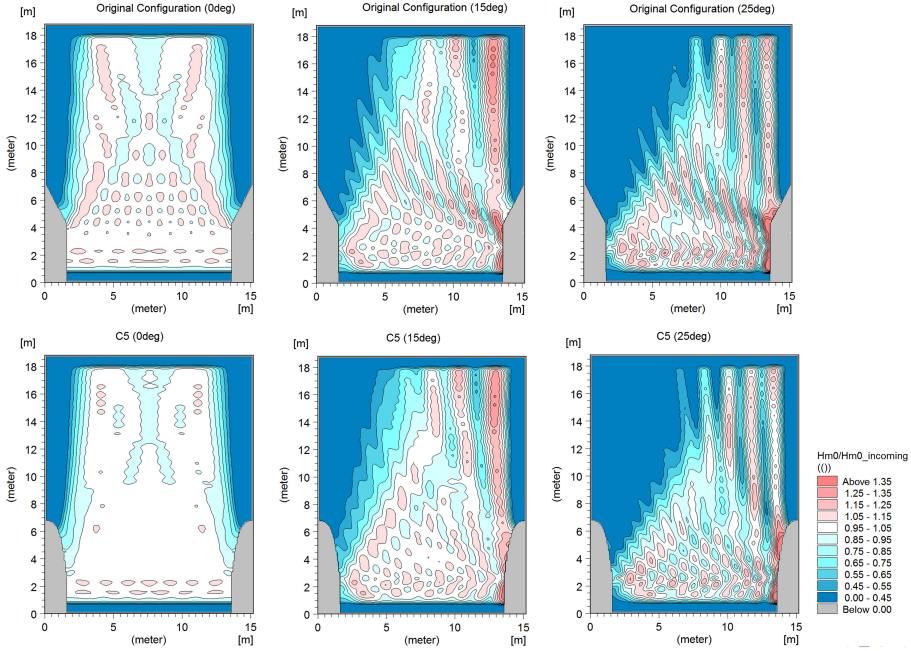
  - linearisation?



The Value of Full Scale Prototype Data – Testing Oyster 800 at EMEC, Orkney, September 2015, Conference: 11th European Wave and Tidal Energy ConferenceAt: Nantes, France



Methods to enhance the performance of a 3D coastal wave basin Louise O'Boyle , Björn Elsäßer , Trevor Whittaker Ocean Engineering, 2017



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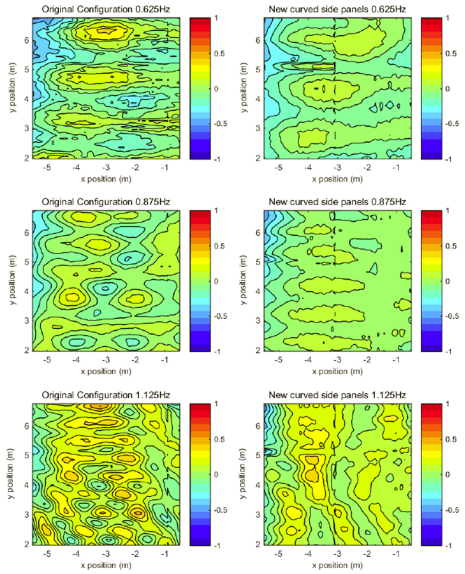

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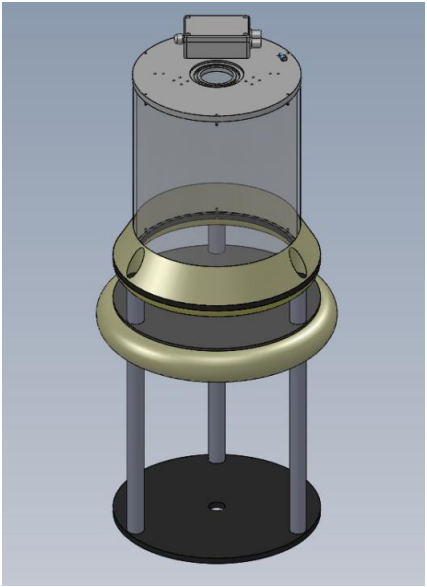
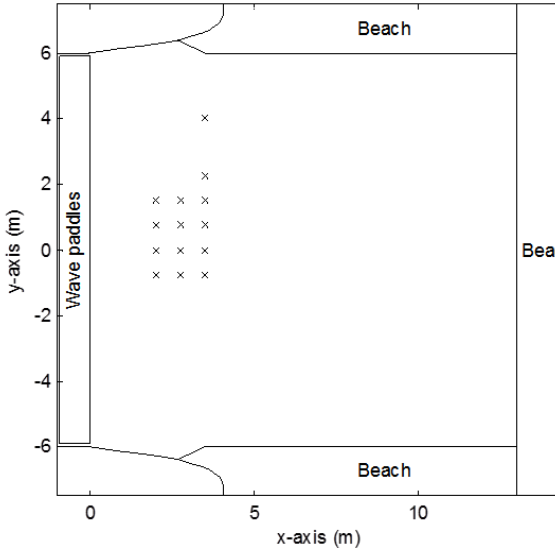
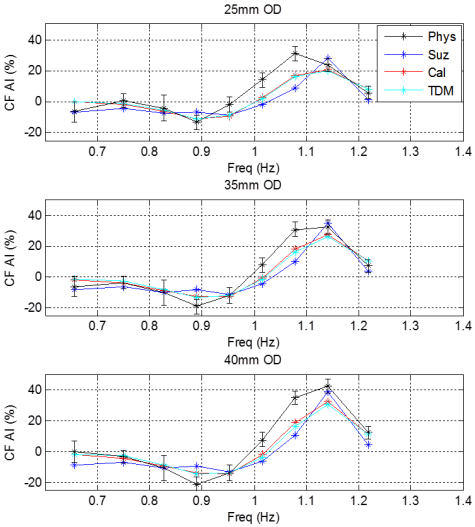




Lamont-Kane, PhD Thesis, 2015


25mm OD
CF AI (%)
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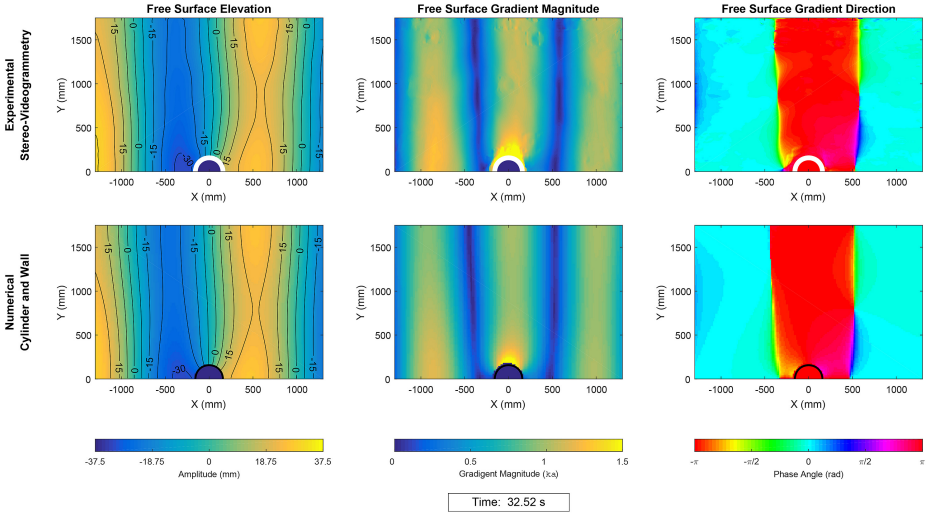
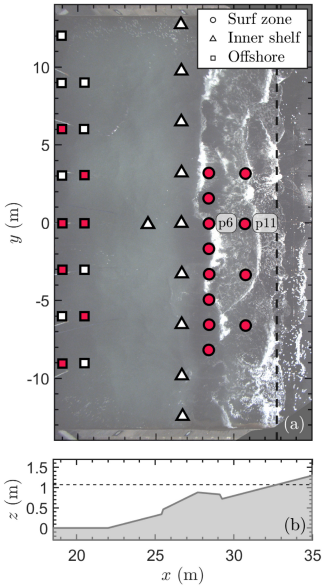
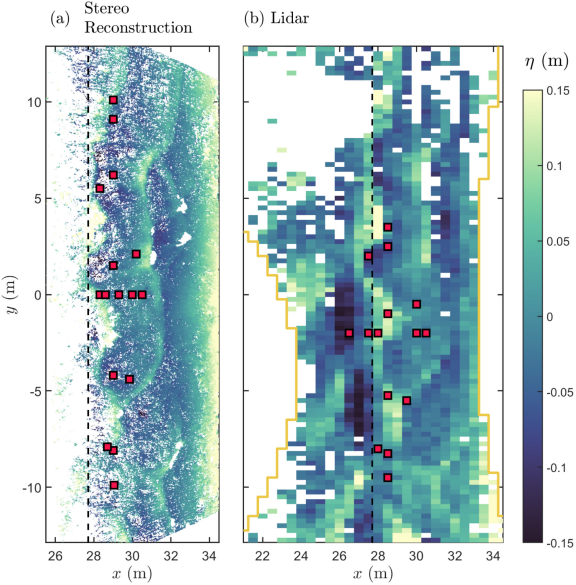
35mm OD
CF AI (%)
Freq (Hz)
40mm OD
CF AI (%)
Freq (Hz)



Preliminary investigation on the use of tank wall reflections to model WEC array effects, Ocean Engineering, 2018, Brian Winship et al



Remotely sensed short-crested breaking waves in a laboratory directional wave basin, Christine M. Baker, Melissa Moulton, Margaret L. Palmsten, Katherine Brodie, Emma Nuss, C. Chris Chickadel, Coastal Engineering, Volume 183, 2023, https://doi.org/10.1016/j.coastaleng.2023.104327.



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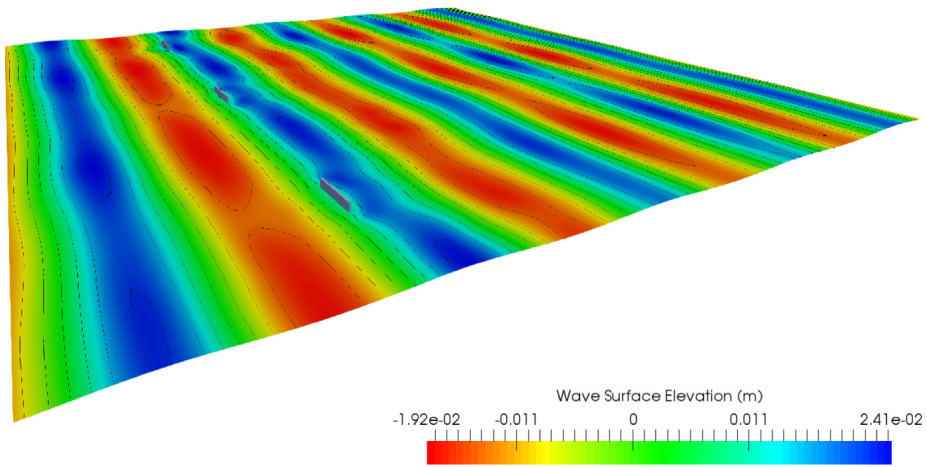
Nonlinear Simulations of Flap Arrays



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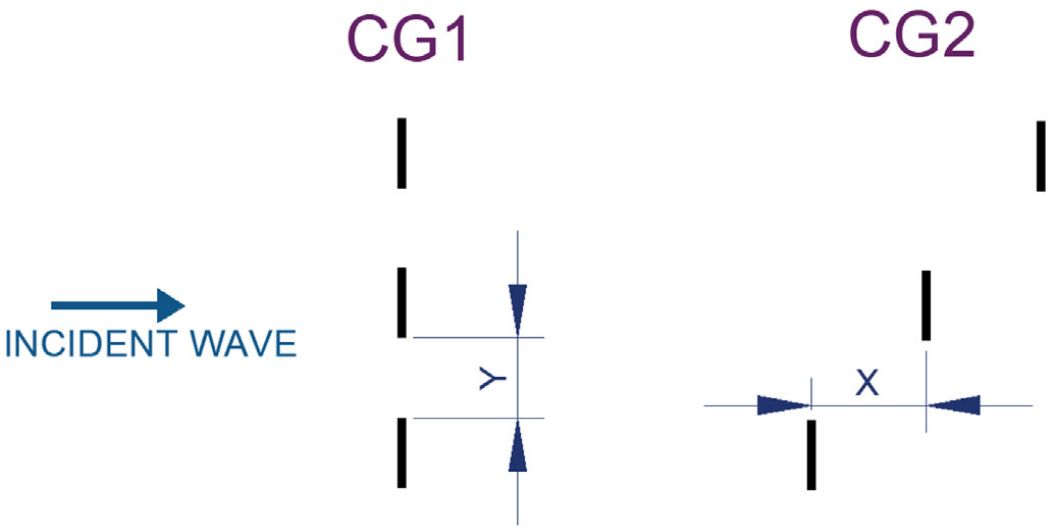

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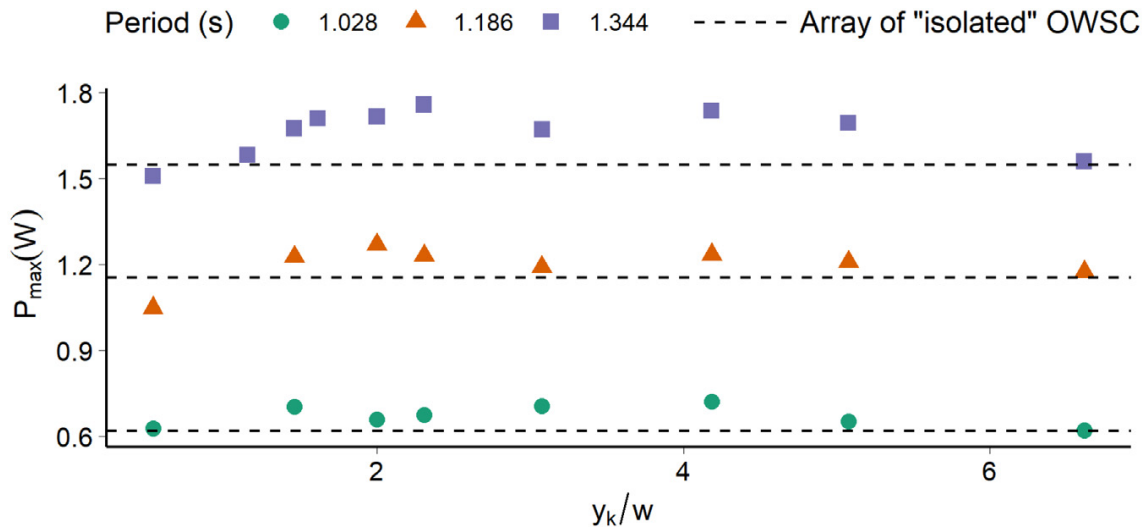

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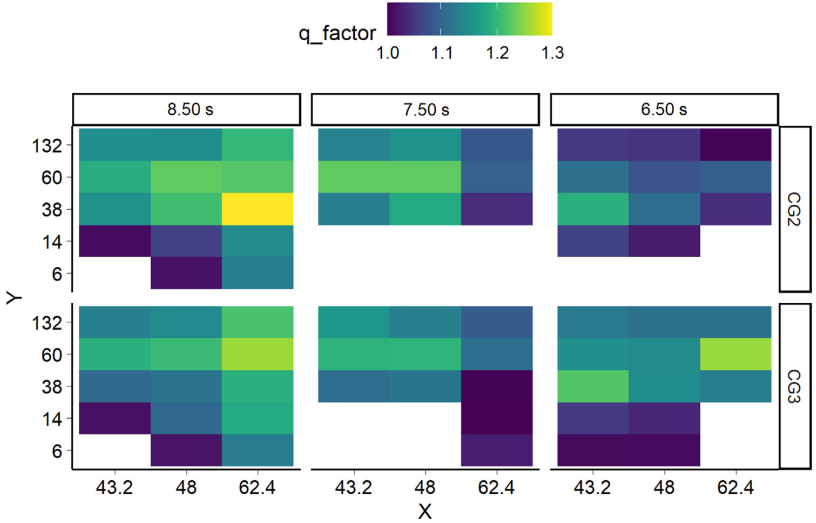

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Conclusions

- Array interaction for realistic applications (Bathymetry, Operational Constraints)
- Good Experiments extremely challenging, but becoming cheaper, more flexible and richer in data -> More efficient for this task
- Control system...

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