

Improvements in the wave flume of the UPV-EHU.



Dimensions: 25 m x 0.6 m x 0.7 m (length x width x height)

XI. Marine Energy Conference

Improvements in the wave flume of the UPV-EHU.



Drilling of the ground for the placement of water pumps



Improvements in the wave flume of the UPV-EHU.



Moving the old flume



Wave generator

Improvements in the wave flume of the UPV-EHU.



Wave generator alignment



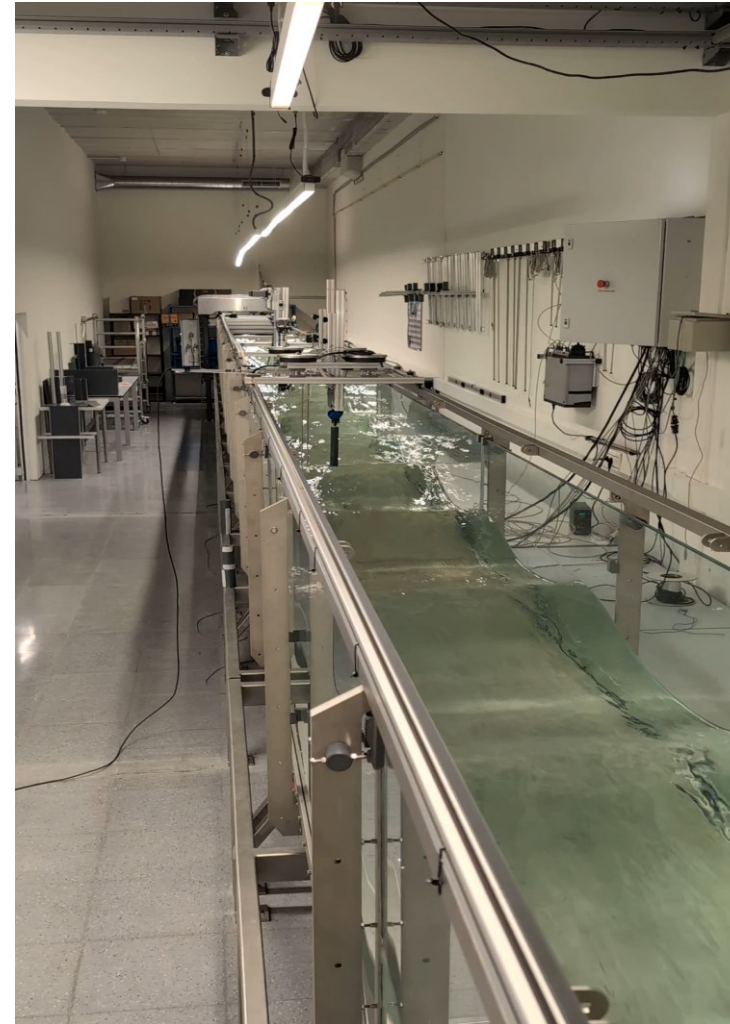
Reinforcing the structure



Filling tests

Wave generator.

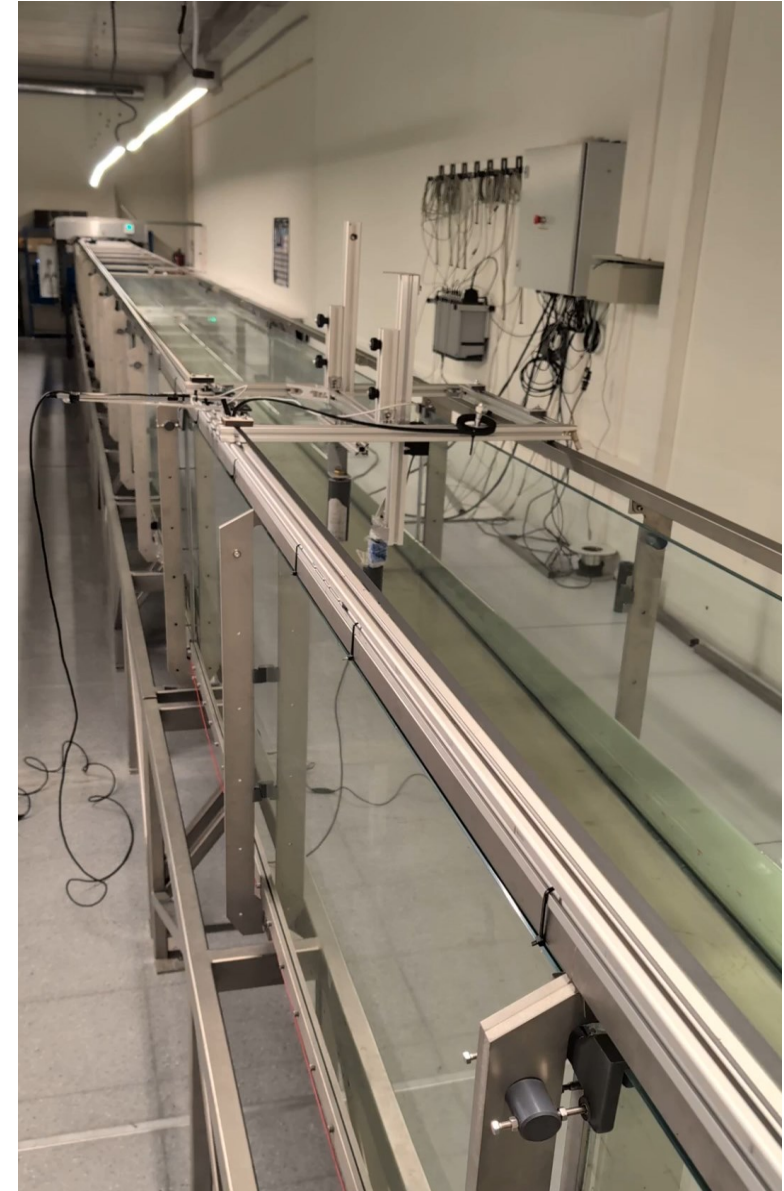
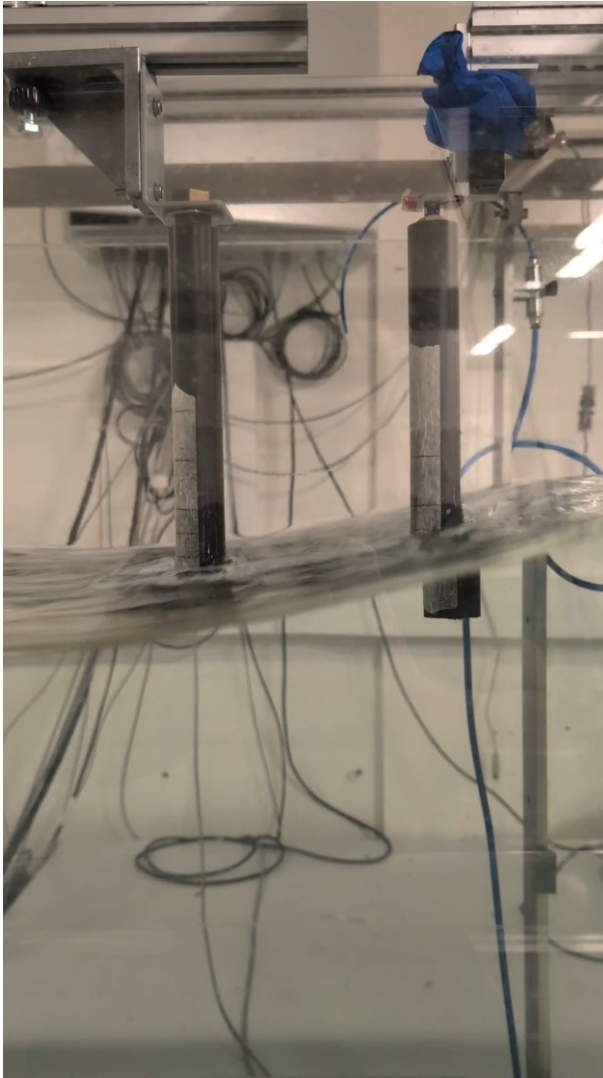
- Type: Piston
- Stroke = 0.8 m
- Power = 1 kW
- HMAX = 0.25 m (for 0.5 m water depth)
- Tmin = 0.4 s
- Awasys
- Wave absorption system
- Types of waves:
 - ✓ Regular
 - ✓ Irregular: Jonswap, Pierson-Moskowitz...
 - ✓ Solitary waves.
 - ✓ Combined sea states



Extinction system (beach).



Towing tank



Currents (real scale): 0.5 m/s, 1 m/s, 1.5 m/s and 2 m/s

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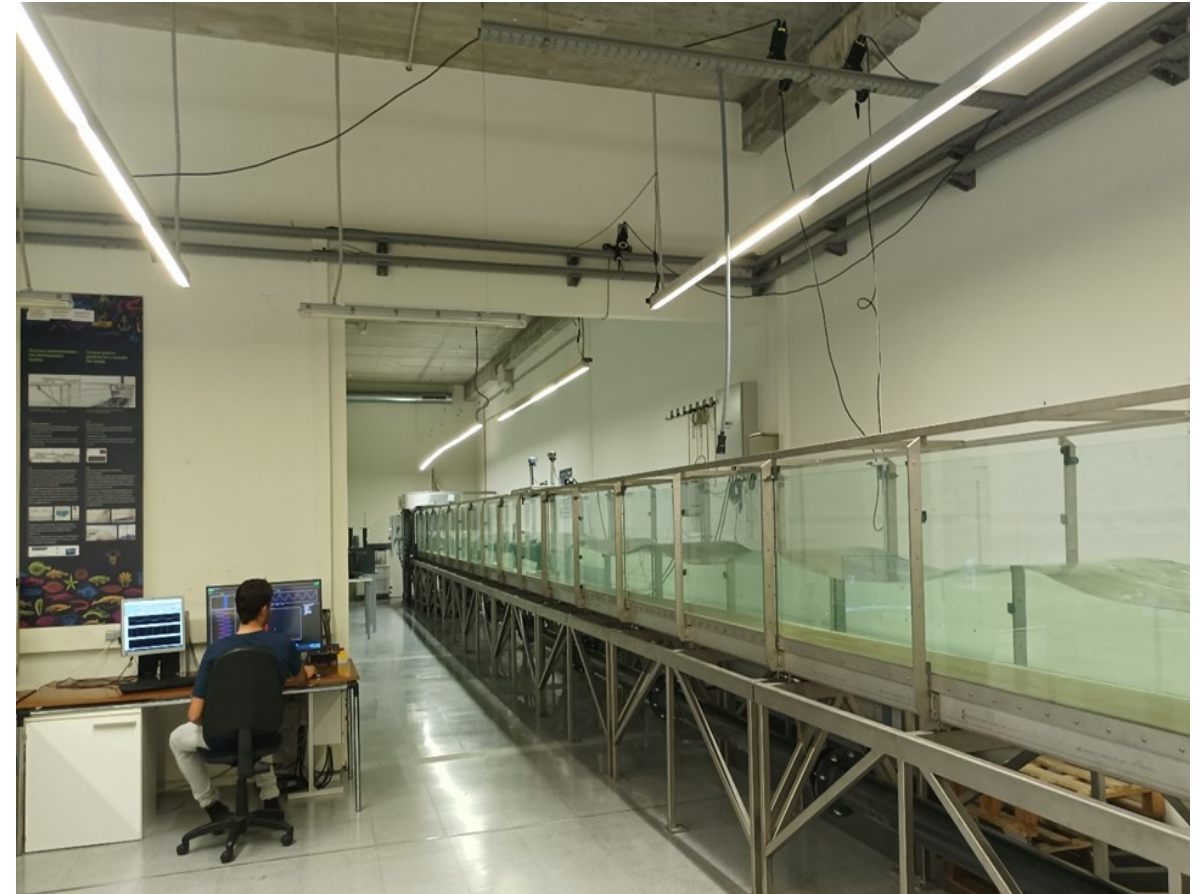


Experimental resources

- Free Surface measuring gauges (x 14)
- Calibration device
- Free Surface ultrasonic measuring
- Force measuring (1 axis)
- Force measuring (6 axis)
- Pressure transducer
- Qualisys cameras
- Chains, springs and anchoring systems
- Towing tank

Simulation resources

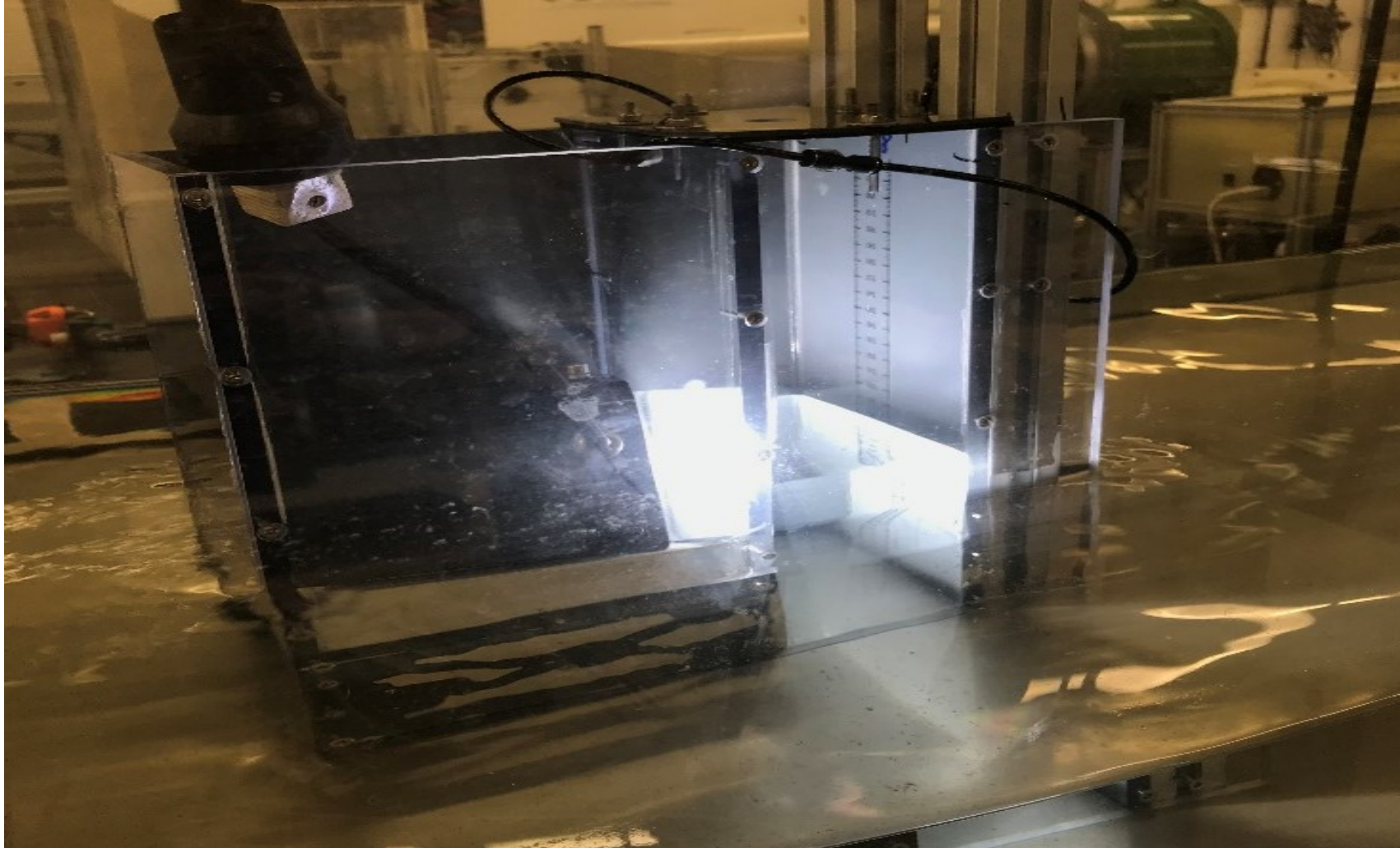
- 3 Workstation: 2 DELL Precision 7920, 24 y 28 Xeon cores + GPU NVIDIA RTX A6000 48 GB, RAM 32 GB y 64 GB y 1 DELL Precision T7810, 16 Xeon cores.
- Server Arina (UPV/EHU): 3.664 Xeon cores - 64 Itanium2 cores - RAM memory 16 to 512 GB/node



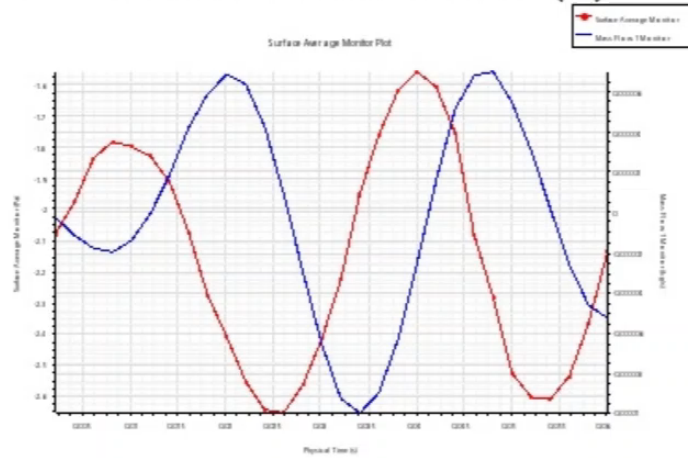
PROJECTS:
Rolling-WEC



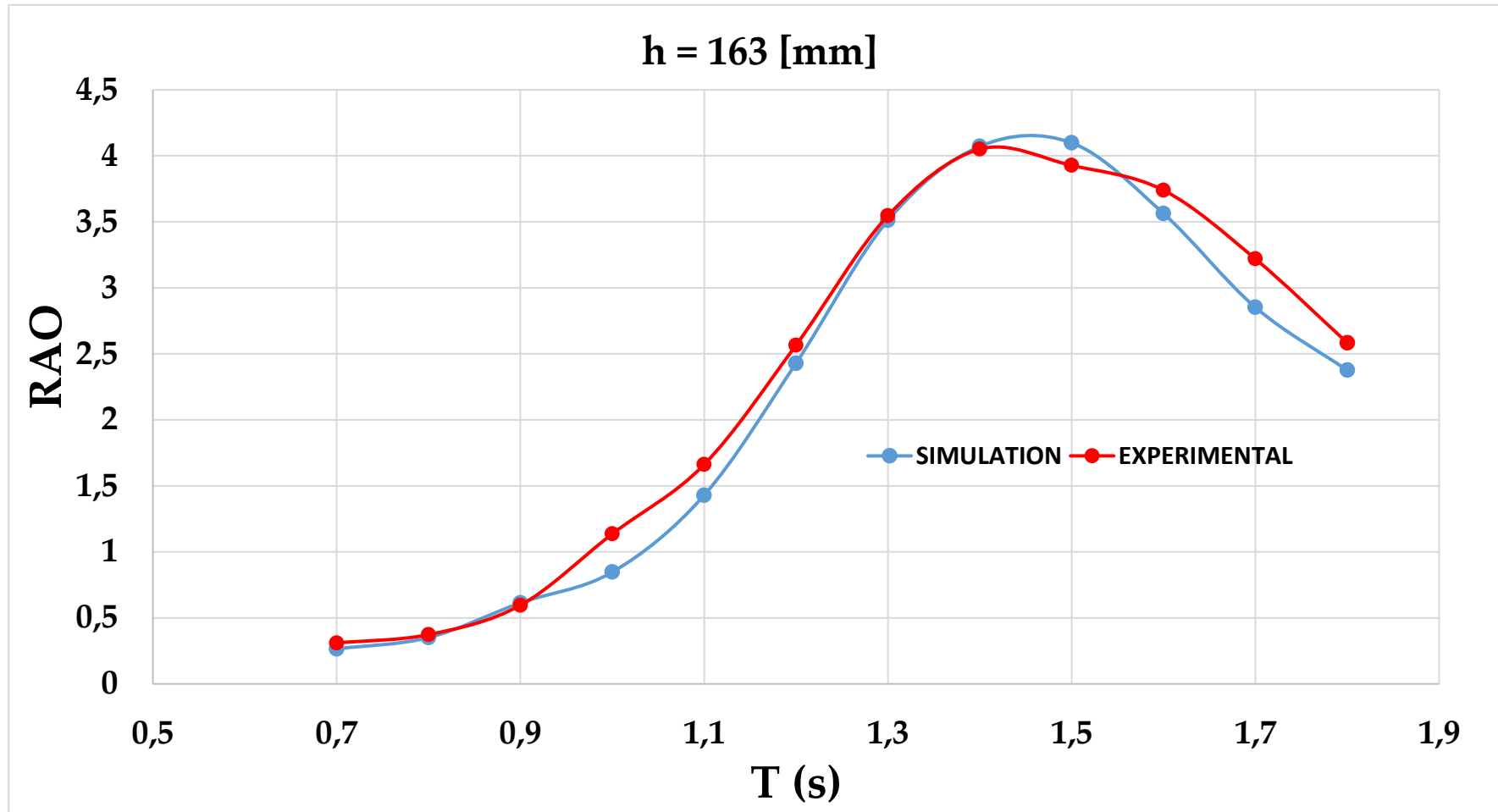
PROJECTS: *GENERA-OWC – (plate hole)*



Solution Time 0.06 (s)

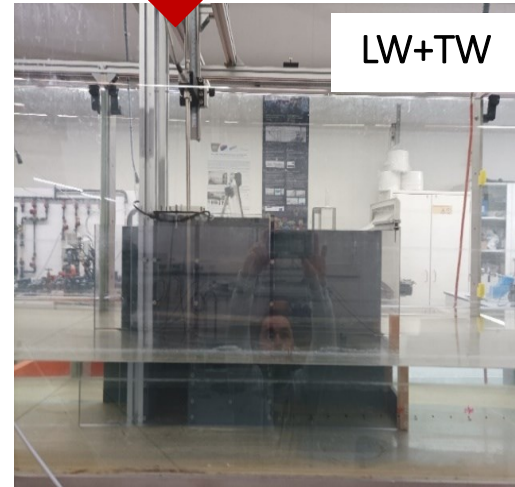
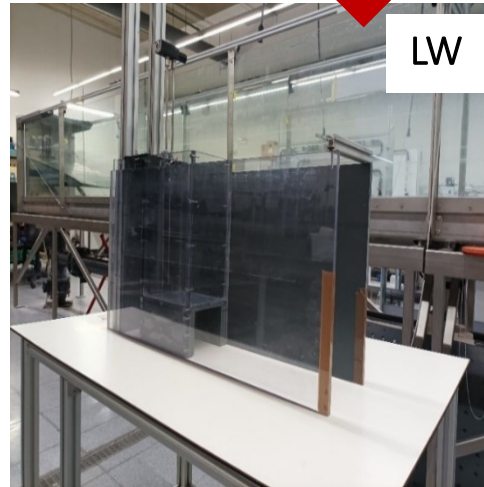
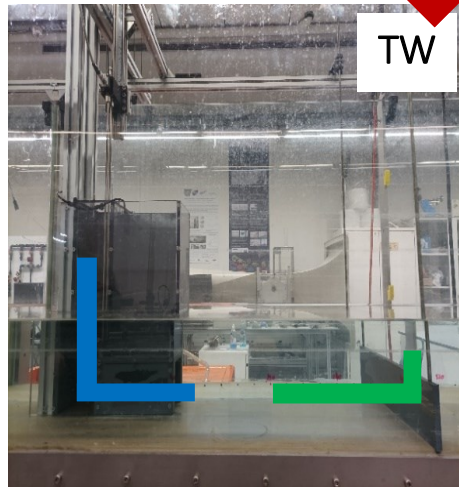


Response Amplitude Operator (RAO).

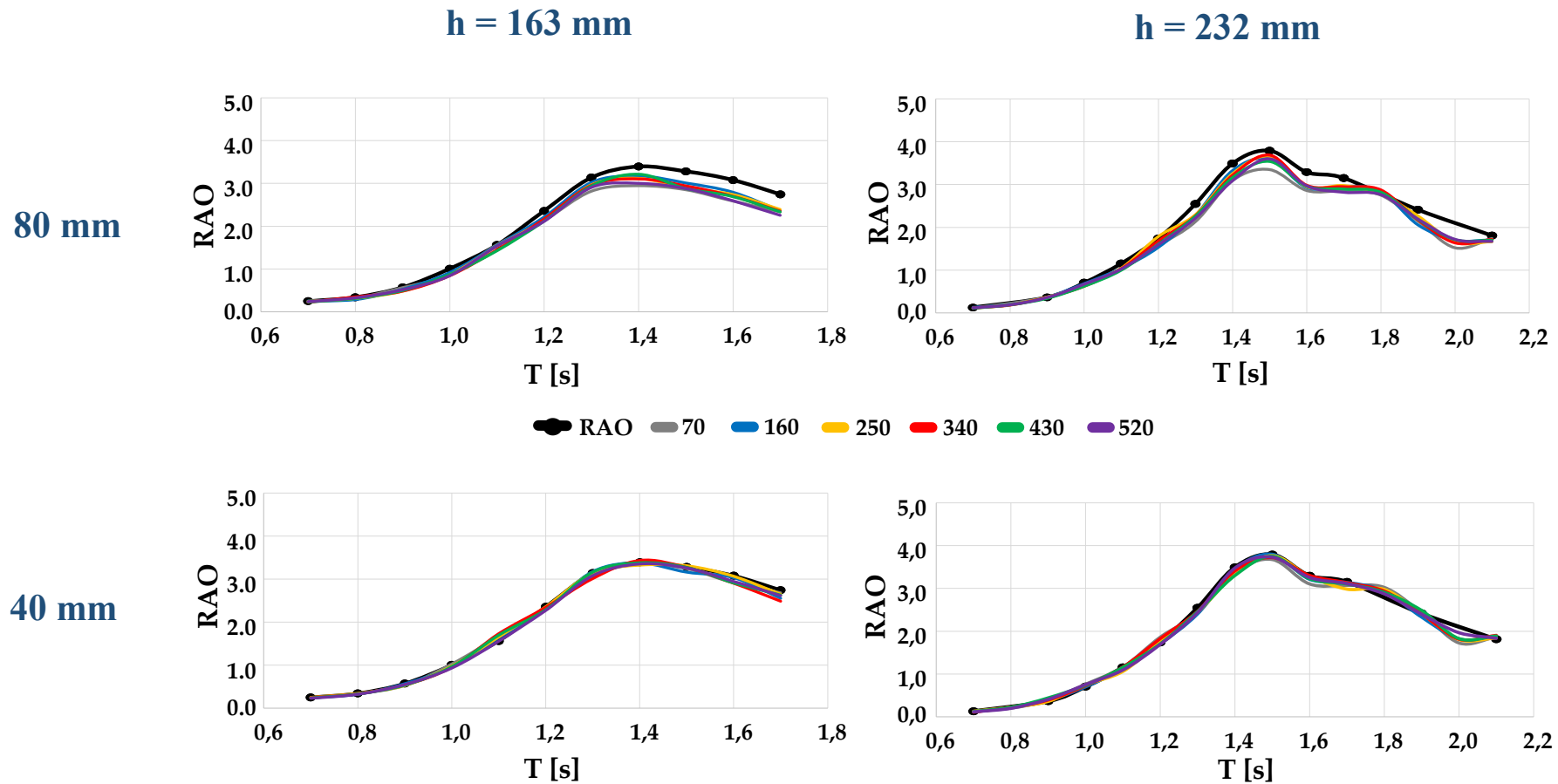


PROJECTS: GENERA-OWC – Alternatives for chambers

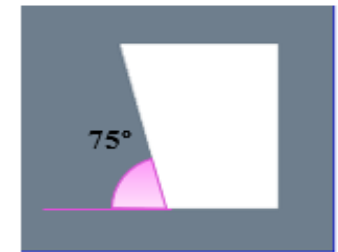
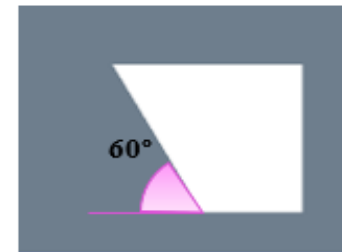
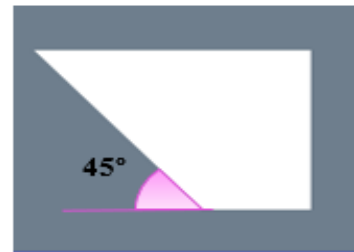
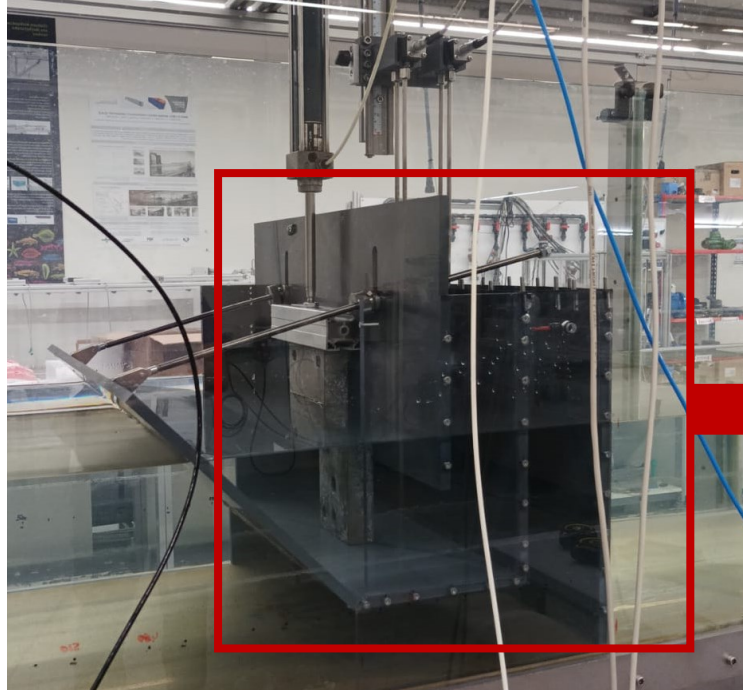
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Configuration	Trasversal Walls	Lateral Walls	Trasversal + Lateral Walls	Harbour Walls
Wall height	40 y 80 mm	-	40 y 80 mm	-



Response Amplitude Operators (RAO).



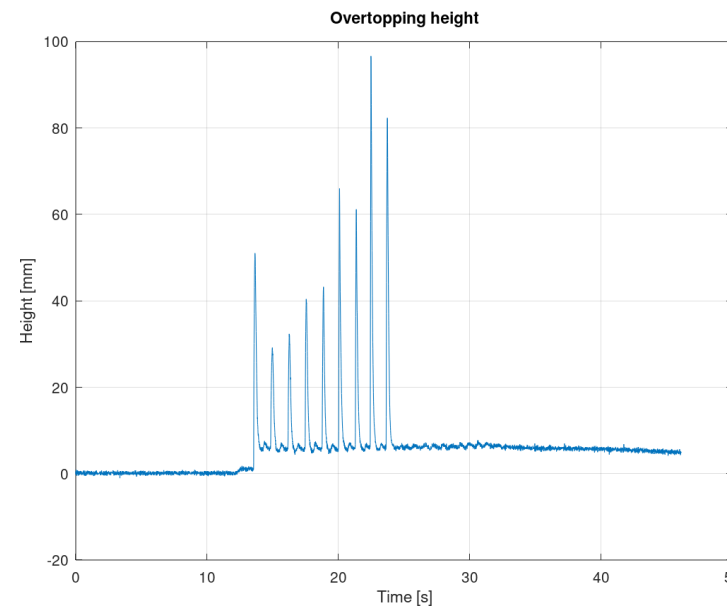
PROJECTS: GENERA-OWC – Water inlet ramps (2D DAMPING).



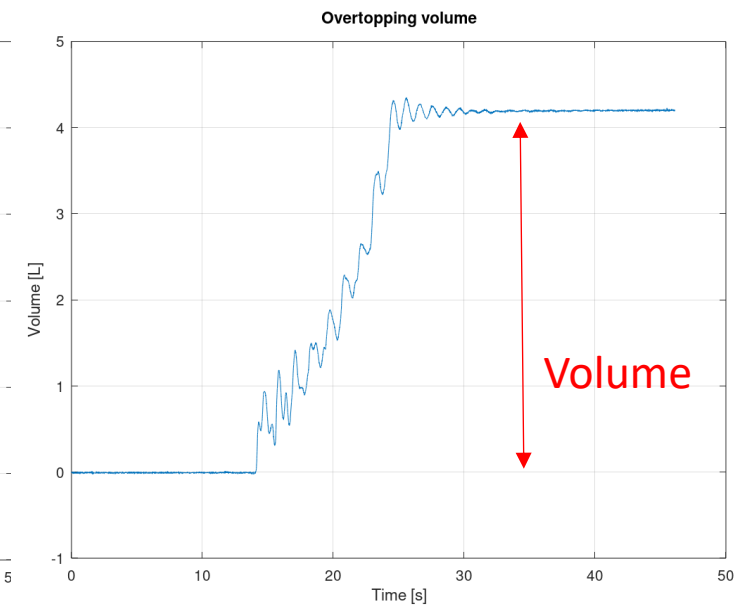
PROJECTS: MATHEO – Overtopping over cylinders.



Individual overtopping events



Accumulated overtopping volume



PROJECTS:

EKIOCEAN - New sustainable concepts of floating photovoltaic plants for the marine environment (2024-25)



Name	H (m)	T (s)
H1T4	1.0	4.0
H1T6	1.0	6.0
H2T5	2.0	5.0
H2T9	2.0	9.0
H4T6.5	4.0	6.5
H4T10	4.0	10.0

PROJECTS: RUL-ET (2025-26)

RUL-ET

Vida útil remanente de fondeos y umbilicales para renovables offshore

RUL-ET PROJECT

El proyecto busca generar nuevos enfoques basados en inteligencia artificial y construcción de datasets para la estimación de la vida útil (RUL) de fondeos y umbilicales para tecnologías renovables offshore.

RESULTADOS ESPERADOS

- 1 LIBRERÍA DE DATOS ÚTILES**
Estimación RUL de fondeos y cables umbilicales
- 1 LIBRERÍA DE SOFTWARE**
Diagnósticos de salud estructural
- 3 MODELOS DE SOFTWARE**
Precisión de vida, gestión de incertidumbre, toma de decisiones de mantenimiento
- 4 EJEMPLOS DE APLICACIÓN**
Definición de características de fondeos y umbilicales en sus contextos

ÁMBITOS DE INVESTIGACIÓN

MONITORIZACIÓN DE CONDICIÓN DE COMPONENTES MEDIANTE IA
Diagnóstico de la salud estructural
Evaluación de la degradación
Modelos de predicción flexibles y generalizables a otros contextos

ESTRATEGIAS DE GENERACIÓN EFICIENTE DE DATASETS
Aceleración de ensayos físicos en laboratorio
Simulación de datos de fallos

HERRAMIENTAS DE TOMA DE DECISIÓN PARA MANTENIMIENTO PREDICTIVO
Optimización multiobjetivo
Gestión de la incertidumbre

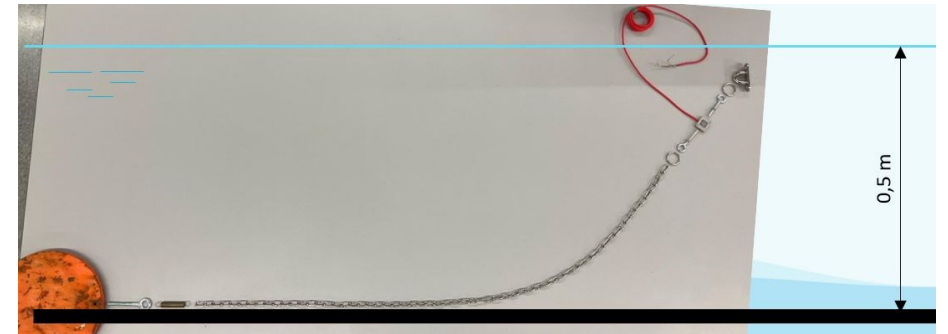
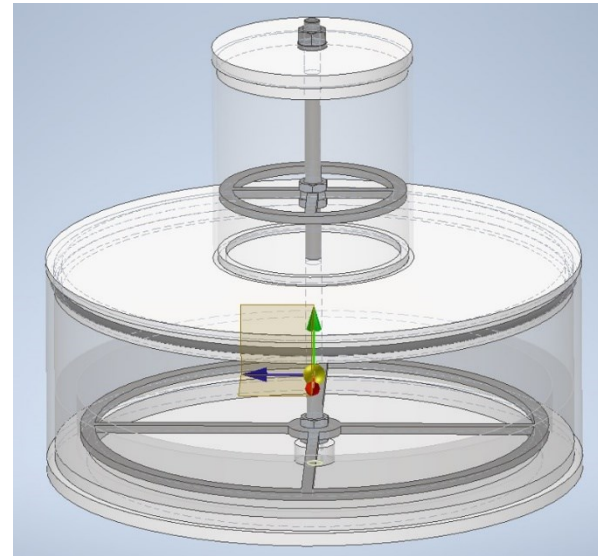
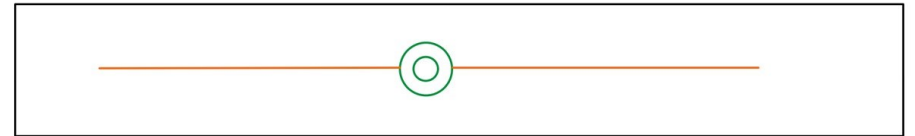
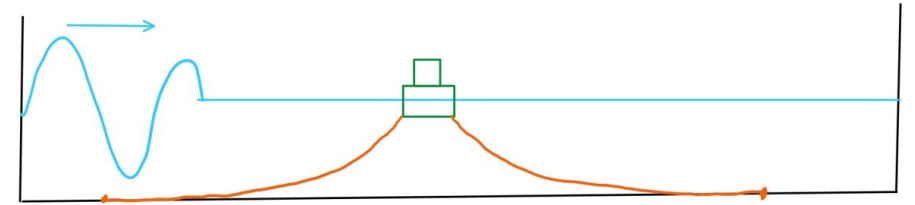
3 fuentes de datos

- Entorno real**
Laboratorio flotante HarrikLab
- Entorno controlado**
Wave Flume, Banco de fatiga
- Datos sintéticos**
Simulaciones numéricas

Consortio: tecnalia, bcam, etc.

Comité Asesor: idom, etc.

Financiación: etc.



Contact



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