RÉPUBLIQUE FRANÇAISE

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Ifremer

VERTI-LAB — HydroQuest — Ifremer

# A common laboratory to develop vertical axis tidal turbine

## 2024- 2028

## Objectives

- Accelerate the development of innovative vertical axis tidal turbines for industrial farm projects.
- Development of dedicated design tools through a series of test campaigns conducted both in a wave and current flume tank and at in-situ testing station.
- Facilitate the industrial development by a joint approach combining small to larger scale testing and modeling.
- Reinforcement of the design efficiency by complementary skills of the partners in fluid mechanics, knowledge of the behavior of structures in a marine environment and feedback from in-situ deployments of tidal turbines.
- Validation of industrial development tools based on comparisons of experimental, numerical and in-situ data at both small and large scales.

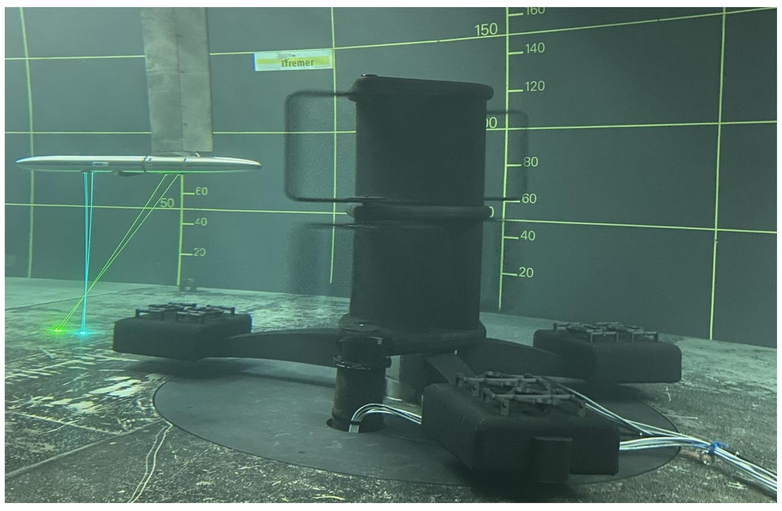
## Key Activities

- Scale model development.
- Experimental campaigns.
- Numerical simulations.
- Experimental and numerical results comparisons.
- Turbine optimization process.
- Resource assessment study.
- Extremes characterization.
- Sensors integration and compatibility.
- PhD works and associated scientific valorization.

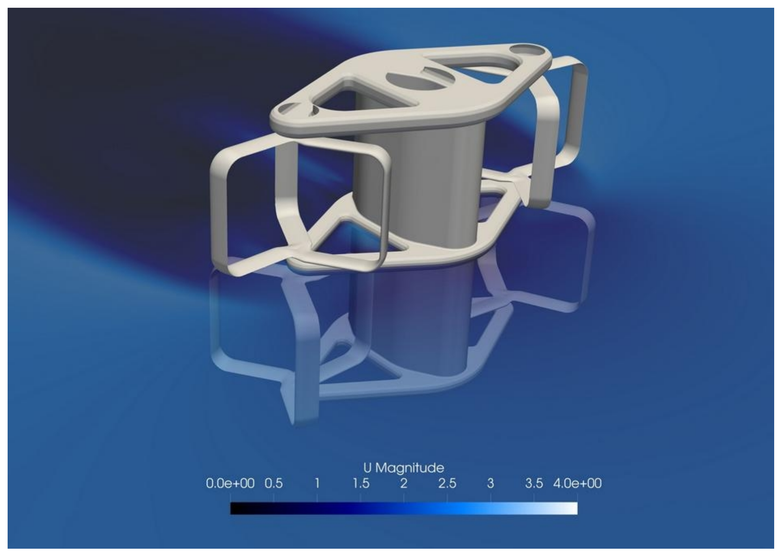
## Expected Results

- Next generation turbine validation and farm projects scenario.
- Dedicated bottom monitoring station.

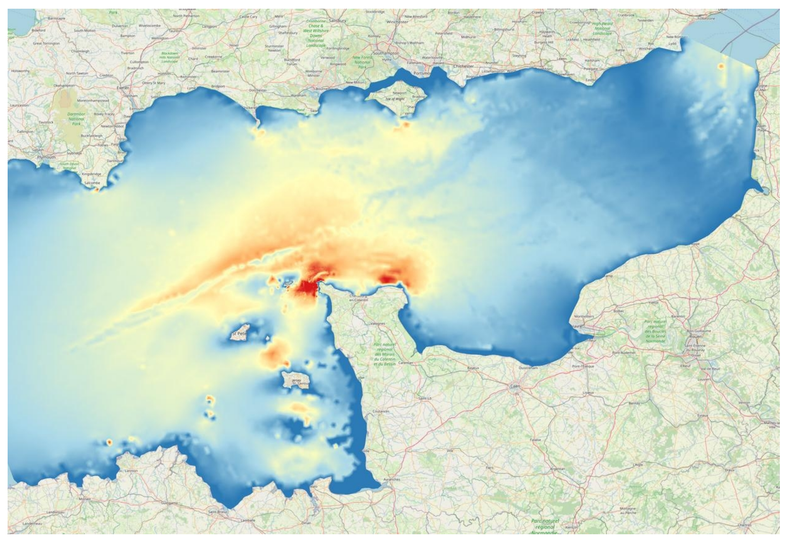
## Make the FloWatt tidal farm project in the Raz Blanchard a success




**1/20 scale model of the HQ 2.5 in the wave and current flume tank for performance and flow characterization**




**RANS 3D flow simulation around the HQ 2.5 turbine for performance and wake characterization**



**TELEMAC 2D simulation of the flow variation in the English Channel with a focus in the Raz Blanchard**


**Deployment in September 2024 for a double ADCP measurement off the coast of Paimpol-Bréhat**

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