MODEL BASIN RESEARCH GROUP
(CEHINAV-UPM)
http://canal.etsin.upm.es

ACTIVITIES PORTFOLIO
(updated 2020/06)
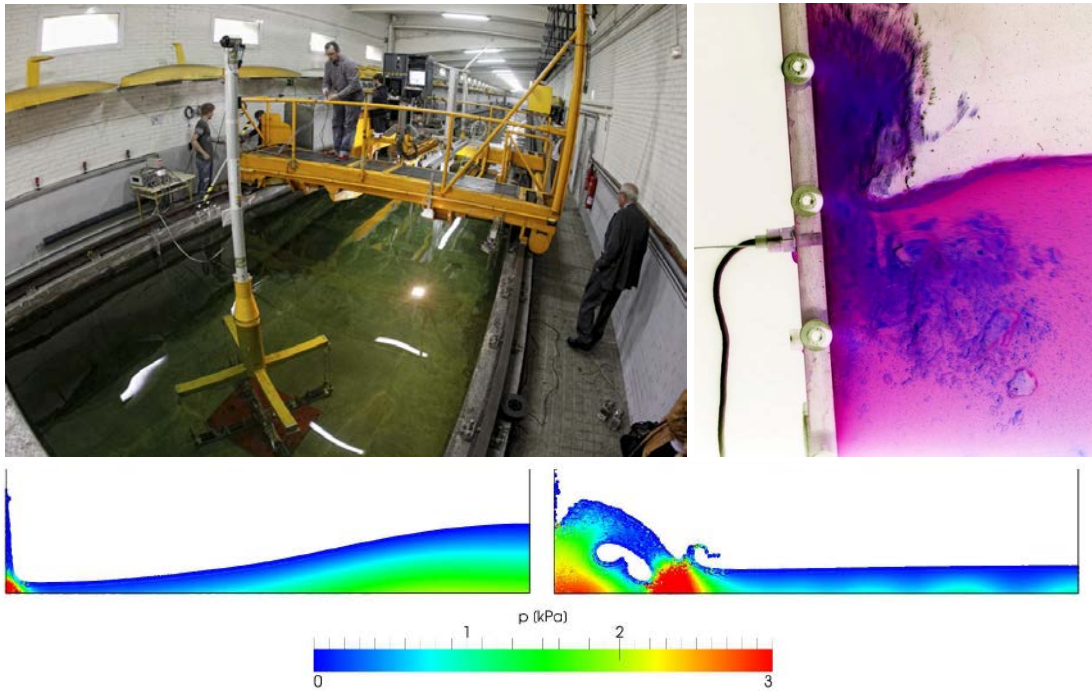
UPM & CEHINAV DESCRIPTION

Universidad Politécnica de Madrid (UPM) is the oldest and largest Spanish technical university, with more than 4.000 faculty members, around 38.000 undergraduate students and 6.000 postgraduates in 21 faculties. UPM researchers have large expertise in research projects participation both at national and international level. The presence of UPM in the international R&D area is ensured by its consistent participation in various EU programmes. UPM has been recognized as the Spanish University with the largest number of projects approved in EU-FP7.

CEHINAV Research Group operates the model basin facilities of Naval Architecture Department of Universidad Politécnica de Madrid (UPM). Its activities include both experimental and numerical campaigns to measure, calculate and investigate the hydrodynamics of ships and offshore platforms.

CONTACT

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RESEARCH GROUP PERSONNEL

Coordinator: Antonio Souto Iglesias (Naval Architect, PhD, professor)
+ 8 full time academics (1 full professor, 6 professors, 2 associate professor)
+ 1 full time PhD researcher
+ 2 full time PhD students
+ 4 full time researchers
+ 1 technician
+ 1 R&D manager.

FACILITIES

1. Model basin; Length: 100m; Width: 3.8m; Depth: 2.2 m.
2. Towing carriage: Max. Speed: 4 m/s.
3. Wave Generator (deep water conditions, T<=1.7s, H<=0.35m, λ<=4.5m).
4. Linear actuator for damping and added masses measurement.
5. Optical tracking tools for motion recording - OptiTrack.
6. Milling facilities, 5 axis.
7. Models up to 500kg (L x 2.03 x 1.40m)
8. Fully equiped single degree of freedom angular motion sloshing rig (up to 150 kg models).
9. PIV System (Particle Image Velocimetry)
10. Dambreak Lab.

SIMULATION

1. Seakeeping Codes: ANSYS-Aqwa
2. CFD: Star-CCM+ & Open-FOAM
3. In-house codes: GPU SPH 3D for sloshing type simulations, panel method for bulbous bow optimization: http://canal.etsin.upm.es/aquagpusph/

SCIENTIFIC SKILLS

1. Towing tests: Ship resistance.
2. Wave (seakeeping) tests for renewable energy devices, including wind turbine platforms.
3. Model construction and instrumentation.

4. Antiroll tank design, test and modeling / Sloshing tests.
5. Particle methods SPH codes development.
6. CFD codes use and development, including Open-FOAM.
7. Seakeeping and mooring modelling.
8. Ship hull CFD optimization expertise.
9. Ship techno-economic model life time assessment tool development expertise.
10. Ship hull experimental optimization expertise.
11. Propeller performance experimental assessment expertise.
12. Software on demand regarding previous items.
13. Efficiency improvements (quality and economic) in model scale tests.
14. Optimization & exploitation of maritime and port infrastructures.
15. Non-intrusive instrumentation for monitoring port infrastructures development.
16. Advanced management of risk in ports.

CONTRIBUTION TO A POTENTIAL PROPOSAL

1. Regular partner and WP/task leader.
2. Tasks related to scientific skills
3. Contacts with third parties in industrial sector (fishing industry, maritime, renewables, etc..) /potential partners.
4. Capabilities to organize enjoyable kick-off and progress meetings.

PREVIOUS RELEVANT INDUSTRY AND RESEARCH PROJECTS

European Projects

1. SACOC: Aerodynamic upgrade of Surface Air Cooled Oil Cooler, European Commission. H2020 - Clean Sky. 2019- 2021 (Partner).
2. SLOWD: Sloshing Wing Dynamics. European Commission. H2020 Program. 2019 – 2021 (Partner).
3. LOOP-Ports: Circular Economy Network of Ports, European Commission. Climate-KIC Holding. EIT SGA 2018. 2018 - 2020. (Partner).
4. ARCWIND: Adaptation and implementation of floating wind energy conversion technology for the Atlantic region, European Commission, Interreg Atlantic Area. 2018-2020. (Partner).
5. DEMOGRAVI3: Demonstration of the GRAVI3 technology – innovative gravity foundation for offshore wind, European Commission, H2020, 2016-2019 (Partner).
6. IMAGE: Innovative Methodologies and technologies for reducing Aircraft noise Generation and Emission, European Commission, H2020, 2016-2018 (Partner).
7. AQUO: Achieve QUieter Oceans by shipping noise footprint reduction, European Commission, FP7, 2012-2014 (Subcontractor).
8. EU-CARGOXPRESS: Greening of surface transport through an innovative and competitive CARGO-VESSEL, European Commission, FP7, 2009-2012 (Partner).
9. SUPERPROP: Superior Life Operation of Ship Propellers, European Commission, FP6, 2005-2008 (Coordinator).

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POLITÉCNICA
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INTERNATIONAL
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National Public Projects

1. Hydrodynamics of Motion Damping Devices for Floating Offshore Wind Turbines (FOWT-DAMP), (ref. RTI2018-096791-B-C21). Funded in Spanish R+D National Plan 2018 call, 2019-2021.
2. Optimization of liquid gas transport for LNG vessels by fluid structure interaction studies (OPTITRANS), (ref. TRA2013-41096-P). Funded in Spanish R+D National Plan 2013 call, 2014-2016.
3. Numerical and experimental characterization of fluid-dynamic loads in LNG transport (LNG), (ref. TRA2010-16988). Funded in Spanish R+D National Plan 2010 call, 2011-2013.

PUBLICATIONS

Ocean Engineering, Journal of Ship Research, Journal of Marine Science and Technology, Journal of Fluid Mechanics, Computer Physics Communications, Experiments in Fluids, Physical Review E., AIAA journal, Physics of fluids, Journal of Fluids and Structures, etc...

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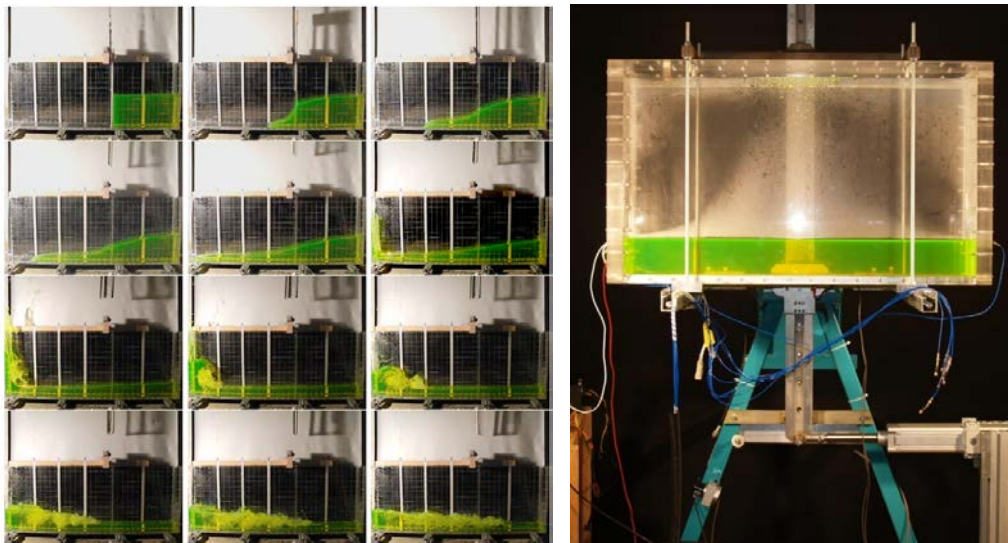
TRAINING

1. GIE: UPM Educational Innovation Group in CFDs
2. Simulation related Courses (Star-CCM+, GID, PYTHON, MATLAB, Open-FOAM)
3. Other courses (fluid mechanics, statistics, project management, water waves, numerical analysis, etc.)
4. Promotion of PhD during project development for Industry partners staff.