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Poster n°25

Inter-Mer Project - Behavior of steel-polymer and concrete-polymer interfaces exposed to seawater

Winner of the 2023 call for projects “Research” WEAMEC

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Emmanuel Rozière[a], Amandine Célino[b], Sylvain Chataigner[c], Arij Fawaz[c], Marion Girard[b], Dania Kabalan[a], Emilie Leprêtre[c]

[a] Ecole Centrale de Nantes, [b] Nantes Université, [c] Université Gustave Eiffel

Summary

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Context: Physico-chemical action of seawater on port structures and installed and floating wind turbine supports in reinforced concrete and steel

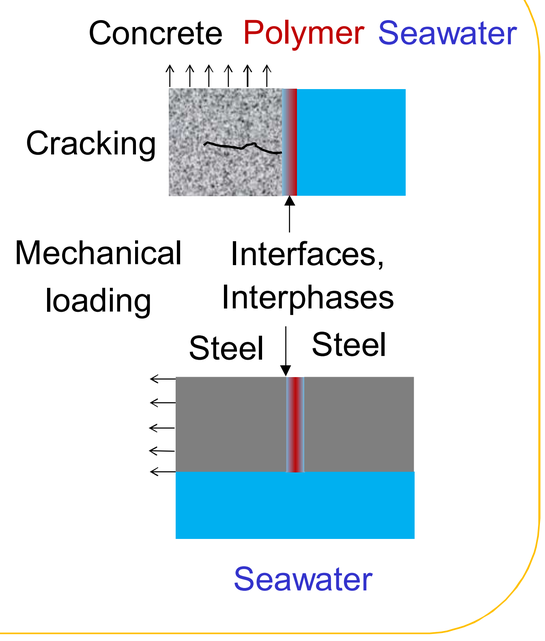
Objective: Use of organic polymer and composite materials to optimize structural design

- Coating of reinforced concrete structures
- Bonding on metal structures

Expected results:

✓ Better understanding of the behavior and durability of steel/polymer and concrete/polymer interfaces exposed to seawater and mechanical loading

✓ Recommendations for industrial design and implementation

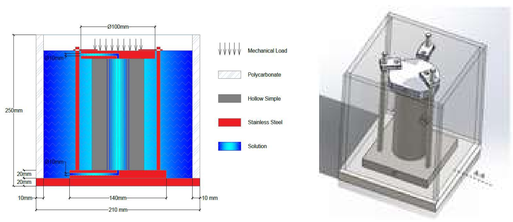


PhD Thesis of Dania Kabalan

Physical-chemical and mechanical performances of cement-based materials and fiber-reinforced polymers in composite structures exposed to environmental actions

Lab. : GeM – Civil engineering and Mechanics Research Institute

Chloride migration cells (concrete)



New procedure to characterize materials exposed to seawater under mechanical loading (El-Khoury, 2022)

PhD Thesis of Arij Fawaz

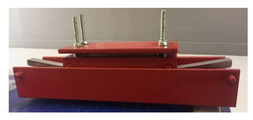
Study the evolution of interface cohesive laws in mode II for an adhesively bonded assembly in a marine environment under load

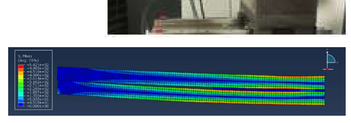
Lab. : SMC – Metallic and cable structures, Univ. Gustave Eiffel

Study the durability of bonded assemblies under different aging conditions:

- Creep (mechanical aging)
- Immersion in water (diffusion phenomenon)
- Hydromechanical aging (creep and water diffusion)

Experimental and modeling approaches





Expected outcomes

Composites and polymers: Bonding, sealing, coating, repair

➢ Contribution of polymers for more resource-efficient design of reinforced concrete and steel structures

➢ Reducing the cost and increasing the reliability of marine renewable energies

➢ Structuring the research and development ecosystem, towards new national and international projects

Contact and information

Coordinator Prof. Emmanuel Roziere

Emmanuel.Roziere@ec-nantes.fr

GeM https://gem.ec-nantes.fr/

SMC https://smc.univ-gustave-eiffel.fr/

INTER MER