Maritime DTU
Center for Maritime Activities

Re-Thinking Sailing Ocean Liners

Type of project: MSc

Project description:

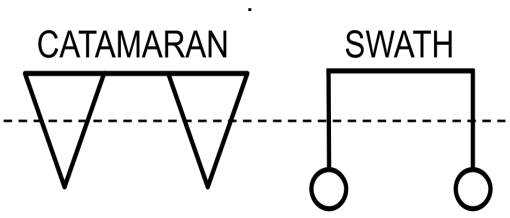
Triggered by climate change and sea pollution the Open Hardware And Design Alliance (OHANDA) is running the multi-disciplinary speculative design project OHANDA ONE – re-thinking the design, building and operation of a new modern zero-emission large sailing ocean liner for frequent passenger transport.

What difference could it make to design a large modern sailing vessel considering state-of-the-art hull design, wind propulsion, control systems and solar powered electric drive?

From an engineering perspective the core challenge towards a promising solution is about combining a relatively stable platform - e.g. catamaran / SWATH design - with an efficient wind propulsion and active stabilising system. While a semi-submerged hull (SWATH) could improve the platform's stability in rough seas, it comes with enhanced active control and balance requirements and more resistance due to a larger wetted surface area. On the other hand, it might significantly reduce the hull's wave resistance and motion at the water surface and consequently increase the efficiency of the wind propulsion system. Since stronger winds induce higher waves, the challenge lies in optimising the vessel's speed and stability at higher wind speeds, both in terms of passenger comfort and the wind propulsion system.

Depending on the background and interests of the student, possible projects could include one or more of the following topics:

- Numerical analysis and comparison of the increased resistance of a semi-submerged hull related to the reduced surface-effects of a traditional design in rough seas.
- Design of a catamaran/SWATH hull with active stabilisation optimised for speed, passenger comfort and wind propulsion systems.
- Advanced optimisation of the hull design including the potential of foiling for large



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