

Master thesis project:

Investigation on a harvesting propeller for wind propelled vessels

Background

Wind powered ships could be a feasible way to reduce the fossil fuel emission from shipping. Currently, much research is focused on the possibility to use wind propulsion to reduce the green-house gas emissions from shipping. In an ongoing research project, Wallenius Marine in cooperation with SSPA, KTH and Chalmers, a wind powered car carrier concept is being developed with this ambition.

This thesis project will complement this project by studying the propeller of wind driven ships and the possibility to use the propeller to generate energy when the wind conditions are favourable. That means when the wind drives the ship at such a large speed that the water rotates the propeller and energy can be generated at the shaft. This energy can be stored onboard and used for propulsion when the wind is less favourable.

Objective and method

There exist a few installations of this kind for small vessels. However, there is a lack of knowledge on the potential of such system for large cargo ships. This project will look into energy harvesting at large wind powered cargo vessels using CFD and other computational tools. The target is to estimate the hydrodynamic efficiency that can be expected, requirements on the propeller design, and the amount of energy that can be harvested on a route. This requires extensive use of CFD as well as propeller design principles and basic naval architecture. A starting point design will be provided by SSPA.

Miscellaneous

The master thesis project is 30 credits and suitable for one or two students. The project is jointly supervised by both Chalmers M2 Division of Marine Technology and SSPA. Preferably, the project would start mid-January 2020 and run to June, but this can be adjusted if needed.

Prerequisites

- Background in Mechanical Engineering, Naval Architecture, Fluid dynamics, or similar
- Knowledge and interest in computational fluid dynamics

Contact

Rickard Bensow, email: rickard.bensow@chalmers.se (Supervisor and examiner)
Sofia Werner, email: sofia.werner@sspa.se

Application deadline for this thesis project is November 20, 2020.