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## Numerical estimation of Pre-Swirl Stator efficiency

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This paper presents the investigation of a Pre-Swirl Stator (PSS) possible benefits on the ship powering system. Analysis of the PSS thrust augmentation is performed using the CFD simulations since the effects of turbulence and viscosity are important in the vicinity of the propeller. Direct propeller modelling is employed with the rotative region and propeller geometry present in the fluid domain. Two separate self-propulsion simulations are run, with and without the PSS, giving a clear correlation between the propulsive parameters and operability of the energy saving device. Results are also partially compared to the relevant experimental data. Hydrodynamic simulations are performed by means of open-source software OpenFOAM. The results show the PSS design to achieve a 4.7% decrease in the delivered power to the shaft which proves the design to be beneficial.

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