

# Study on efficiency effect and water noise reduction by energy saving devices

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## ABSTRACT

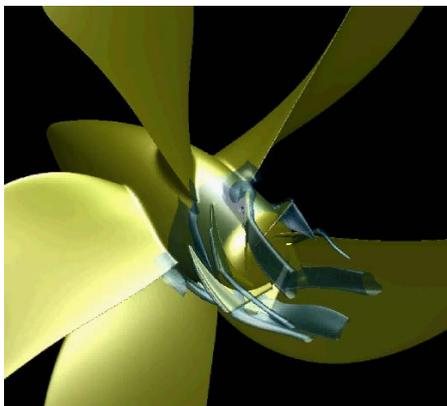
In recent years, the EEDI regulations for global GHG reduction has been strictly updated. From these back ground, environmentally friendly operation and propulsion systems are expected.

In view of propulsion system design, GHG redction by improving propulsion efficiency, and comfortable habitability by noise reduction are focused. Many ship designers and manufactures developed a variety of energy saving devices such as the propeller cap with fin, rudder bulb and duct to improve propulsion efficiency.

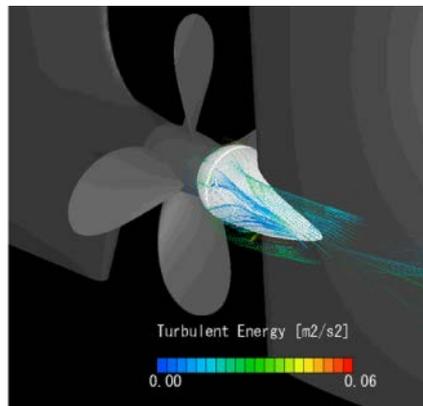
In general, the efficiency improvement effect of each energy saving devices are predicted by ship desiners and manufactures. Therefore, when the ship is installed with several energy saving devices, the gain of propusion efficiency from synergistic effects are sometimes unclear at the design stage.

In this paper, in order to evaluate synergistic effects of energy saving devices, the authors designed ECO-Cap<sup>1)</sup>, Ultimate Rudder<sup>2)</sup> and Neighbor Duct<sup>3)</sup> for 82kBC by using CFD and conducted the model tests of each devices. Furthermore, the combinations tests of different devices were carried out in model tests.

This paper summarizes the synergistic effect of energy saving devices on the basis of the model test. In addition, noise reduction effects by energy saving devices are also described for informative reference.



ECO-Cap



Ultimate Rudder



Neighbor Duct

## REFERENCES

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