شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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HANAA ALY

RIM DRIVEN THRUSTER OPTIMIZATION USING NUMERICAL SIMULATION

By

Yara Omar Hassan Hassan Omar

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Aerospace Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis: **Rim Driven Thruster Optimization Using Numerical Simulation**

Key Words: Rim Driven Thruster, Computational Fluid Dynamics, Overset Grid, Cavitation, Swirl Recovery Vanes

Summary:

CFD is used to calculate the performance of rim driven thruster. The choice of mesh strategy, turbulence model and cavitation model is validated and verified using ITTC benchmark propeller and SeaThrust TM T160 RDT experimental data. Different blade parameters are manipulated to test the effect on thruster performance. Combined cases are applied by adding the vanes with 5-blades rotor and changing pitch angle using 5-blades to enhance efficiency. The later case resulted in the best performance increasing the efficiency by 6:4% and widening the operation range as cavitation is delayed.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.
I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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