CFD STUDY OF LIFT AND DRAG BEHAVIOR OF STRETCHED HEMISPHERE IN A FULLY IMMERSED FLOW USING STAR-CD

ANAZ NAZREN ZAINUDIN
(2006689332)

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Faculty of Mechanical Engineering,
University Technology MARA (UiTM),

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"I declared that this thesis is result of my own work except the ideas and summaries which I have clarified their sources. This thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree"

Signature: ....

Date: 14 / 05 / 2010

Anaz Nazren B. Zainudin
UiTM No: 2006689332

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ABSTRACT

Lift and Drag Coefficient are one of important parameters in modifying geometrical shapes or in this case hemisphere shape will be used. In progress, this hemispheric shape will be modified throughout this whole project where it will be stretched into different length-to-diameter ratios which in this case will 2:1, 2.5:1, 3:1, 3.5:1, 4:1 and 4.5:1. This shape will be simulated in a way to obtain the highest net drag coefficient and at what angle that the net drag coefficient is best. Identifying the sustainability of this stretched hemispheric shape to retain its drag value under rotational mode before the lift coefficient exceeds the drag coefficient value is one of the main objectives in this project. CATIA is used to design this hemispheric and its stretched shape. Then, the final shapes are simulated by using STAR CCM+ to obtain its drag and lift coefficient. Every shape is simulated in various angles of attack in order to achieve what is the best drag and lift coefficient and at what angle that they intersect with each other. Results obtain from this simulation process will be exposed out at the end of this project and will be observed and discussed thoroughly.

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