TRACK 4: ADVANCED ENGINEERING TOPICS

"APPLICATION OF UNSTEADY CFD SIMULATION FOR PRELIMINARY ASSESSMENT OF AIRCRAFT PERFORMANCE"

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ABSTRACT

Conventionally, aircraft performance simulation required large database to determine its aerodynamic characteristics. This translates into large number of CFD simulations that may take several days. In some instances, aerodynamic interferences could not be captured accurately. Unsteady CFD simulations tightly coupled with trajectory simulations can offer an alternative method to overcome these constraints.

This study serves as an example on the usage of such unsteady CFD simulations in the preliminary modelling of a small unpowered glider that is approximately 8 inch diameter in size. Based on several estimates on the material, weight distribution and moment of inertia of these gliders, unsteady state computational fluid dynamics (CFD) simulations of these gliders were made to estimate the flight trajectory under free fall conditions. Post-processing of these simulations allowed preliminary insights on how the CG location affected the glide ratio and flight behavior.

BIOGRAPHY OF SPEAKER

Mr Voo Keng Soon and his colleagues, Mr Pang Weng Wah Edward and Mr Lim Zhi Wei Jonathan have been practicing as aeronautical/mechanical engineers with DSO National Laboratories, Singapore. Their current role lies in the analysis of platform aerodynamics, propeller design, mechanical design and system integration.