



**CFD ANALYSIS OF BWB AIRCRAFT MODEL WITH  
ELEVATOR DEFLECTION OF +5(DOWNWARD) AT  
SIMILAR REYNOLDS AND MACH NUMBER WITH  
WIND TUNNEL TEST**

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## **ABSTRACT**

Blended Wing Body or BWB is a hybrid shape that mainly resembles a flying wing, but also incorporates some features of a conventional airliner. This design also known as a new concept in aircraft design. The advantages occur in BWB is more related on aerodynamic design and this paper will discuss and determine the aerodynamic characteristic of elevator deflection of BWB at +5"downward. The main focus is on elevator because the elevator is one of the part to control blended wing body during flying or landfall. The model need to be builds and designing process were done using CATIA software. Then the model will be meshed and analyzed using STAR CCM (one of the software of computational fluid dynamic). Steady-state, three-dimensional CFD calculations were made for the BWB model using the standard one-equation turbulence model, Spalart-Allmaras model via STAR CCM software. The parameter setting in the software will be the same in wind tunnel. Then comparison of aerodynamic characteristic such as lift coefficient, drag, coefficient and moment coefficient were made between BWB models with the prototype of BWB which will be tested experimentally in wind tunnel. Both will use Reynolds number similarity in order to come out the aerodynamic analysis. The value of Reynolds number is  $RE=6.793 \times 10^6$ . This project will be useful to understanding the effect of aerodynamic of BWB model.

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