Verification of Boeing 737-800 Aircraft Model with Varied Components Using MATLAB-AID

Abstract

Aircraft design requires aerodynamic modeling to estimate the stability of modifications to established designs. In response to the need to reduce carbon emissions of commercial aircraft, modifications to the engine and body are needed to accommodate different space and weight requirements associated with cleaner fuel types. The objective of this project aims to establish a baseline stability model for the Boeing 737-800 using MATLAB-Aircraft Intuitive Design (AID), a stability modeling software and validate the accuracy of the model by comparing the results with published and experimental data. The benefits of MATLAB-AID include the ease of use and the relatively quick outputs that can provide an initial view of aircraft stability. The model parameters, lift coefficient and drag coefficient were compared to published data and experimental data of a similar model. Geometry modifications to the baseline 737-800 were analyzed for comparison. The expected outputs of lift and drag coefficients at varied aerodynamic parameters will be compared to acquired data. The verified model can be used to estimate stability for carbonless fuel type design modifications that are anticipated to alter engine type of current commercial aircraft.