

## A Review Of Blended Wing Body And Slender Delta Wing Performance Utilizing Experimental Techniques And Computational Fluid Dynamics

**Authors :** Abhiyan Paudel, Maheshwaran M Pillai

**Abstract :** This paper deals with the optimization and comparison of slender delta wing and blended wing body. The objective is to study the difference between the two wing types and analyze the various aerodynamic characteristics of both of these types. The blended-wing body is an aircraft configuration that has the potential to be more efficient than conventional large transport aircraft configurations with the same capability. The purported advantages of the BWB approach are efficient high-lift wings and a wide airfoil-shaped body. Similarly, symmetric separation vortices over slender delta wing may become asymmetric as the angle of attack is increased beyond a certain value, causing asymmetric forces even at symmetric flight conditions. The transition of the vortex pattern from being symmetric to asymmetric over symmetric bodies under symmetric flow conditions is a fascinating fluid dynamics problem and of major importance for the performance and control of high-maneuverability flight vehicles that favor the use of slender bodies. With the use of Star CCM, we analyze both the fluid properties. The CL, CD and CM were investigated in steady state CFD of BWB at Mach 0.3 and through wind tunnel experiments on 1/6th model of BWB at Mach 0.1. From CFD analysis pressure variation, Mach number contours and turbulence area was observed.

**Keywords :** Coefficient of Lift, Coefficient of Drag, CFD=Computational Fluid Dynamics, BWB=Blended Wing Body, slender delta wing

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020