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## **CFD** Analysis of Double Wedge Airfoil

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Abstract: This study presents a Computational Fluid Dynamics (CFD) analysis of a double wedge airfoil to evaluate its aerodynamic performance across various flight conditions. Using the Navier-Stokes equations and turbulence models like k- $\varepsilon$ , simulations were performed for both incompressible and compressible flows. Results indicate that at low angles of attack, the airfoil achieves moderate lift and low drag, while higher angles lead to flow separation, increasing drag and reducing lift. In supersonic regimes, the airfoil exhibits efficient lift with minimal shock wave effects. The study underscores the influence of angle of attack, Mach number, and Reynolds number on lift and drag, offering insights for optimizing airfoil design in high-speed aerospace applications

Keywords: Double wedge aerofoil, CFD simulation, coefficient of drag(Cd), Coefficient of lift (Cl), supersonic flow

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