World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:13, No:03, 2019

Computational Fluid Dynamics Analysis of an RC Airplane Wing Using a NACA 2412 Profile at Different Angle of Attacks

Authors : Huseyin Gokberk, Shian Gao

Abstract : CFD analysis of the relationship between the coefficients of lift and drag with respect to the angle of attack on a NACA 2412 wing section of an RC plane is conducted. Both the 2D and 3D models are investigated with the turbulence model. The 2D analysis has a free stream velocity of 10m/s at different AoA of 0°, 2°, 5°, 10°, 12°, and 15°. The induced drag and drag coefficient increased throughout the changes in angles even after the critical angle had been exceeded, whereas the lift force and coefficient of lift increased but had a limit at the critical stall angle, which results in values to reduce sharply. Turbulence flow characteristics are analysed around the aerofoil with the additions caused due to a finite 3D model. 3D results highlight how wing tip vortexes develop and alter the flow around the wing with the effects of the tapered configuration.

Keywords : CFD, turbulence modelling, aerofoil, angle of attack
Conference Title : ICAAE 2019 : International Conference on Aerospace and Aviation Engineering
Conference Location : Madrid, Spain
Conference Dates : March 26-27, 2019