

ABSTRACT

This study investigates the effect of leading edge tubercles on the aerodynamic performance of a NACA0012 aerofoil by using the FUSION 360 for CAD designing and simscale for CFD analysis and also investigates how the change in amplitude of the tubercles affects its performance. The tubercle model results are compared with those of the straight leading edge. The analysis was also carried out on three different amplitudes of aerofoil by keeping the wavelength same and their results were compared. The analysis of the propeller was carried out at speed of 3000 rpm corresponding to a angle of attacks of 10deg.

The results obtained showed that the tubercle aerofoil gave better lift co-efficient in the post-stall region and also delayed the stall phenomenon. It was found that the lift co-efficient of straight leading edge (base) aerofoil was better than those of tubercle in pre-stall region. Further, on comparison of the tubercles with different amplitudes, it was observed that varying the amplitude and wavelength results in change in thrust and torque, changing the amplitude and wavelength may provide better performance in both the pre-stall and post-stall region.

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