Mech Aero-2013

OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Exhibition on
Mechanical & Aerospace Engineering

September 30- October 2, 2013 San Antonio, Texas, USA

Numerical and experimental study on low reynolds number flows over NACA245 aerofoil

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Abstract

Laminar separation bubble over NACA2415 aerofoil at low Reynolds numbers and different angles of attack was numerical and experimental investigated in detail. From the experiments, the flow separation, the reattachment and forming the laminar separation bubble were clearly seen, and it was indicated that the point of separation moved towards the leading edge as the angle of attack increased. Moreover, the flow visualization results showed that as the angle of attack increased further, at the angle of attack of 13º the bubble burst and the separated flow was not able to reattach to the aerofoil surface, which indicated the stall. In the numerical results, the transition models are shown to accurately predict the location of the experimentally determined separation bubble. Conversely, the numerical prediction using the transition models are more successful than the turbulence models.

Biography

Halil Hakan AÇIKEL is a mechanical engineer and research assistant in the Department of Energy Systems Engineering at Erciyes University. He has completed his M.Sc at Erciyes University. His research interests include experimental fluid mechanics, aerodynamics, low Reynolds number flows, active flow control, micro air vehicles and wind energy. He has published 6 publications such as book chapters and journal and conference papers