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Experimental investigation of vortex shedding around different low aspect ratio wings at low Reynolds number flows

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Abstract

Low Reynolds number flows and vortex shedding over a rigid flat-plate wing, NACA0012, NACA2412, NACA4412 aerofoils at different angles of attack was experimental investigated. It was measured the vortex shedding frequency from the dominant frequency in the spectra of the velocity fluctuations in the wake of the rigid flat-plate wing, NACA0012, NACA2412, NACA4412 aerofoils for aspect ratio (AR) of 1, 2, 3, and 2-D wings. The location of the hot-wire probe was varied in different downstream stations (for example, one chord-length and two chord-lengths from the trailing-edge). In doing so the probe was kept in the quarter-span plane in the spanwise direction, rather than the mid-span plane (in order to avoid the proximity to the wing support). Consequently, the measured frequency of vortex shedding from different low aspect ratio wings show remarkably small effect of aspect ratio even when it is as low as unity results of this work will be widely useful to make more accurate modeling of high temperature fuel cells.

Biography

M. Serdar Genc is an Associate Professor in the Department of Energy Systems Engineering at Erciyes University. He has completed his Ph.D. from Erciyes University and postdoctoral studies from University Bath. He is Vice Chairman of the Department of Energy Systems Engineering. His research interests include experimental fluid mechanics, aerodynamics, computational fluid dynamics of low Reynolds number flows, transition and turbulence modeling, flow control, micro air vehicles, wind energy and meteorology. He has published more than 50 publications such as book, book chapters and journal and conference papers and serving as an editorial board.

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