

عنوان مقاله:

Force Generation Mechanisms by an Insect Wing in Hovering Motion with Different Flipping Schedules

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نویسندگان:

H. R. Hamdani - Aerospace Engineering Department, College of Aeronautical Engineering, National University of Sciences and Technology, Pakistan

A. Aizaz - Aerospace Engineering Department, College of Aeronautical Engineering, National University of Sciences and Technology, Pakistan

M. A. Naqvi - Aerospace Engineering Department, College of Aeronautical Engineering, National University of Sciences and Technology, Pakistan

خلاصه مقاله:

The aerodynamic force and the flow structure of a wing performing hovering motion at small Reynolds number ($Re=4000$) is calculated by computationally solving the 3D Navier-Stokes equations. The computations are performed for the hovering motion which consists of stroke 1, followed by the flipping motion for reversing the direction and then the stroke 2 (similar to stroke 1 but in the opposite direction). The intent of the study is to research the effects of different scheduling of the flip motion between the two strokes. At $Re=4000$, the delayed stall mechanism is noted during the azimuth rotation of a wing with a high value of CL due to stabilized Leading Edge Vortex. The lift contribution during the flip (pitch rotation for reversing the direction) for the complete stroke is not substantial. During a stroke, the wing encountered the wake from the previous stroke in which, the wake does not contribute positively

کلمات کلیدی:

Hovering, Delayed stall, Low Reynolds number, Wake capture, Flip scheduling, CFD

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