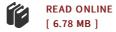# Simulation and Analysis of Wing Rock Physics for a Generic Fighter Model with Three Degrees-Of-Freedom

By Ahmed A Saad

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.Modern fighter designs have been associated with lateral self-excited oscillations known as Wing Rock. Simulations of wing rock by flow visualization utilities have been encouraged to develop a complete understanding of the fluid mechanism that drives the motion as well as for prediction purposes. Previous wind/water tunnel simulations have been limited to a single degreeof- freedom (DoF) in roll. Numerical simulations utilizing computational fluid dynamics (CFD) have also been limited to a single DoF in roll and applied to simple flying delta-wing configurations. The loss of simulation accuracy due to reducing the actual wing rock six DoF to a single roll-only DoF has not as yet been fully investigated. In this study, for the first time, wing rock is computationally simulated in three DoF: roll, sideslip, and vertical motion to study the effect of adding the sideslip and vertical motion. The results are for a generic fighter model consisting of a fore-body, a cropped delta wing, and a vertical fin. The effect of including the vertical fin is also studied.Computational simulation of wing rock in three DoF for...

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