

**COMPUTATIONAL STUDIES ON AILERON MORPHING IN UAV
(COMPUTATIONAL STUDIES ON VARIABLE TRAILING EDGE IN UAV)**

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ABSTRACT

Research on aircraft morphing has exploded in recent years. Morphing aircraft have the ability to actively adapt and change their shape to achieve different missions efficiently. Materials advancements have helped to increase possibilities with respect to actuation and, hence, a diversity of concepts and unimagined capabilities. In general, a conventional aileron on an UAV wing can reduce the aerodynamic efficiency due to geometric discontinuity. On the other hand, the aerodynamic performance can be improved by using a shape-morphing aileron wing instead of a separated aileron. Two dimensional computational studies were carried out for various angles of attack with different aileron deflection angles at constant Mach number 0.1 for both morphed wing and un-morphed wing and got 1.49 as maximum average increment in C_l/C_d using morphed aileron wing. Increment in C_l/C_d results increase in range of UAV flight and reduction in fuel consumption. And also discussed a few aspects related to the physical aileron morphing mechanism.

KEYWORDS: Aileron Morphing, Aileron Morphing Mechanism, Aerodynamic Characteristics