

## Structural Analysis of an Active Morphing Wing for Enhancing UAV Performance

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**Abstract :** A numerical study of a design concept for actively controlling wing twist is described in this paper. The concept consists of morphing elements which were designed to provide a rigid and seamless skin while maintaining structural rigidity. The wing structure is first modeled in CATIA V5 then imported into ANSYS for structural analysis. Athena Vortex Lattice method (AVL) is used to estimate aerodynamic response as well as aerodynamic loads of morphing wings, afterwards a structural optimization performed via ANSYS Static. Overall, the results presented in this paper show that the concept provides efficient wing twist while preserving an aerodynamically smooth and compliant surface. Sufficient structural rigidity in bending is also obtained. This concept is suggested as a possible alternative for morphing skin applications.&nbsp;

**Keywords :** aircraft, morphing, skin, twist

**Conference Title :** ICASMP 2018 : International Conference on Aerospace Structures and Materials Performance

**Conference Location :** Dublin, Ireland

**Conference Dates :** July 23-24, 2018