

Abstract

The Role of Composite Anisotropy in Aircraft-System Wing Movement Produced by Actuators [†]

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Aircraft-system wings are made from composite materials (polymers with pre-impregnated fibers), where their movement can be explained by the presence of shape memory alloy (SMA) actuators, contributing to their excellent performance (Figure 1). The present study aimed to highlight the effect of composite anisotropy on the efficiency of the actuators.

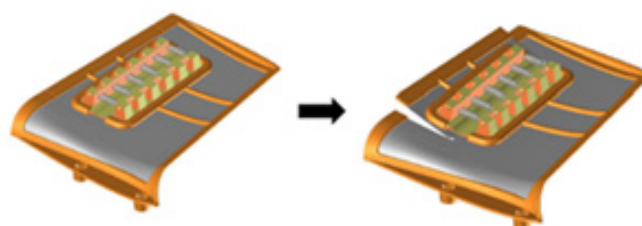


Figure 1. Aircraft system before and after SMA actuator effect [1].

To guarantee the best success of the actuator in the movement of aircraft wings, the mechanical properties of the selected composite were evaluated, keeping in mind the best orientation of the moving part. Then, the mechanical behavior of the composite material was evaluated by three-point bending, defining the forces necessary to move the composite matrix function of the orientation of the impregnated fibers.

A prototype was designed and developed to carry out the tests that established the relationship between the elastic deformation of the composite suitable for the application.

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