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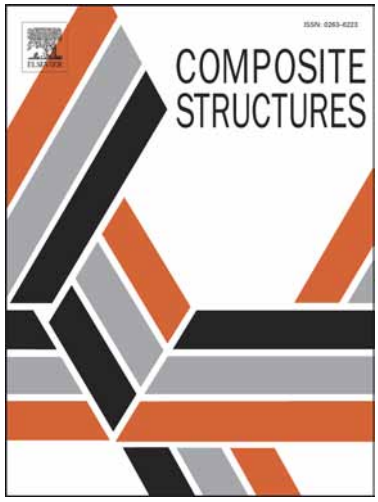

Dynamic and aeroelastic behavior of composite plates with multimode resonant shunted piezoceramics in series

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DYNAMIC AND AEROELASTIC BEHAVIOR OF COMPOSITE PLATES WITH MULTIMODE RESONANT SHUNTED PIEZOCERAMICS IN SERIES

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A better understanding and improvements on the dynamic and aeroelastic behaviors of composite structures by using active and passive control strategies are nowadays key issues in designing advanced lightweight aerospace structures with smaller levels of vibrations in order to perform their tasks with success, reliability and safety. However, since light structures tend to be more flexible, it is necessary that the structure itself shows the ability of dissipating energy and stabilizing itself when subjected to external dynamic loadings imposed by the airflow. In this sense, smart materials can be used as an excellent alternative, being able to stabilize these structures. The interest here is to investigate the possibility of increasing the supersonic flutter boundary of a composite flat panel by applying a multimode shunted piezoceramic in series topology, in which active control strategies cannot be easily performed. Despite the fact that much research on passive aeroelastic control strategies have been conducted in the open literature, few works have been suggested the use of multimode shunt circuits to deal with the flutter problem of aeroelectromechanical systems, which motivate the study reported herein.

Keywords: passive control, multimode shunt circuits, aeroelasticity, composite structures.

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