# ON IMPROVING THE LOSS FACTORS OF AEROSPACE STRUCTURES HAVING CONSTRAINED LAYER DAMPING TREATMENT

**Thomas K. Joseph; K. Renji**
UR Rao Satellite Centre (URSC)
Department of Space, ISRO Vimanapura Post
Bangalore-560 017,India
Email : tkj@ursc.gov.in

**Kartik Venkatraman**
Department of Aerospace Engineering
Indian Institute of Science
Bangalore-560 012,India
Email : kartik@iisc.ac.in

## Abstract

The loss factor of a structure can be significantly improved through constrained damping treatment using viscoelastic layer. Even after introducing the constrained damping layer, the effective loss factor achieved is seen to be far less than the loss factor of the basic viscoelastic material. Methods to improve the loss factor of the aerospace structures further are of great practical importance. In this work, two methods are investigated, one is extending the damping treatment to the boundaries and the other is related to the use of stand-offs for the viscoelastic layers. It is shown through experiments and numerical simulation that significant increase in the loss factor can be achieved by extending the damping treatment into the interfaces, especially in the second bending mode of vibration. Stand-offs having good extensional modulus can improve the loss factor of the bending modes further, though its shear modulus does not play any significant role.

**Keywords:** Aerospace Structure, Constrained Damping, Loss Factor, Passive Control, Standoffs, Viscoelastic Material