

**ACOUSTICS2008/3474**  
**Acoustic characterization and noise reduction strategies for a  
general aviation aircraft**

Nicola Rusciano and Massimo Viscardi  
Dept. of Aerospace Engineering - University of Naples, Via Claudio, 21, 80125 Naples, Italy

This work concerns with the vibro - acoustic characterization of a general aviation aircraft with the objective of designing solutions to reduce the inside noise level during the flight; first of all a new passive insulation, and then verifying the possibility of an active noise control approach. The acoustic characterization was performed into two different step; in- flight acoustic and vibration measurements during a typical mission of the vehicle were initially measured, to characterize the acoustic levels and spectra elated to the different flight operations . Ground measurement were also performed to characterize the sound insulation properties of the aircraft structure . The next item was the partial re-design of the sound insulation pack for the vehicle by the use of innovative material; the choice of the best technical solution has been performed by the use of numerical prediction models and through experimental tests on modified samples of the aircraft structure. The in-flight acoustic and vibration measurement showed also the presence of dominant low frequencies tonal components related to the BPF's and upper harmonics. This situation suggested the possibility to implement an active noise control approach. All these activities will be herein presented and discussion of the main results will be performed within the paper.