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Paper's title : Sound transmission characterization : application to a sandwich composite space structure.

Abstract :

Acoustic insulation represents a very important issue in many fields of acoustic engineering. This issue is generally assessed through one characteristic named sound insulation parameter or sound Transmission Loss (TL) factor.

Research for materials with high mechanical-resistance-to-weight ratio promotes sandwich composite structures, but these ones present lower acoustic insulation performances than metallic homogeneous structures. Thus, the correct identification and assessment of the main transmission loss factor drivers for sandwich composite structures are essential to improve their acoustic isolation efficiency.

In space industry, acoustic characterization of sandwich composite structures, such as launcher fairing, is a key point for payload and equipment acoustic comfort assessment, when facing severe broadband environment during lift-off phase.

In this paper, the acoustic characterization of a stiffened metallic panel is firstly discussed. Computations are performed with Airbus D&S homemade Statistical Energy Analysis software SEA_LASCAR. Next, sound transmission computations and measurements are compared for model validation and correction. Then, the modelling is extended to an industrial sandwich composite structure. Last, the limits of the method are described.