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quantification of structural damping of a multi-layered windshield at low and medium frequencies

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Structural damping is known as one of the most efficient design variable in order to reduce structure-borne noise. At low and medium frequencies (100-500 Hz), the vibro-acoustic behavior of the car is essentially governed by large panels as windshield, roof or front panel for example. In order to improve the car body design regarding cost, weight, performances and reliability, one must have a good understanding of the damping performances of these large panels submitted to various operating conditions. In a previous paper, the authors have proposed an improved method for structural damping numerical assessment of structural elements with non uniform damping using a stochastic distribution of input forces. In the present paper, this method is applied to quantify the structural damping of a multi-layered windshield at low and medium frequencies. Effects of the geometry, of the viscoelastic properties of the PVB layer and of the windshield glue bead on the total damping properties will be studied.