Characterisation of a dissipative assembly using structural intensity measurements and energy conservation equation

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Available online 19 January 2006

Abstract

It is possible to get from complex velocity maps obtained by optical measurements (holographic interferometry, laser doppler vibrometry, etc.) and wavenumber processing, useful quantities to study energy flows in structures such as intensity, power flow, forces, localisation of sources and sinks of energy. In this paper, scanning laser vibrometer measurements on two-plate assembly are used to determine the dissipating power by the joints from the above-mentioned energetic quantities. The average power flow over lines parallel to the junction is computed using the proposed method in order to check a one-dimensional model of power flow distribution along the other dimension. An approximate energy conservation law of flexural vibration which gives good results on beam structures and measurement data are used to determine the dissipation characteristic of joints.

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Keywords: Dissipative assembly; Scanning laser doppler vibrometry; Joints characterization; Structural intensity; Flexural power flow; Vibration energy conservation law; Diffusion equation