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# Vibration Propagation in Structures Through Structural Intensity Analysis

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**Abstract :** Structural intensity is a technique that can be used to indicate both the magnitude and direction of power flow through a structure from the excitation source to the dissipation sink. However, current analysis is limited to the low frequency range. At medium and high frequencies, a rotational component appear in the field, masking the energy flow and make its understanding difficult or impossible. The objective of this work is to implement a methodology to filter out the rotational components of the structural intensity field in order to fully understand the energy flow in complex structures. The approach is based on the Helmholtz decomposition. It allows to decompose the structural intensity field into rotational, irrotational, and harmonic components. Only the irrotational component is needed to describe the net power flow from a source to a dissipative zone in the structure. The methodology has been applied on academic structures, and it allows a good analysis of the energy transfer paths.

**Keywords :** structural intensity, power flow, helmholt decomposition, irrotational intensity
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