

## Vibration Propagation in Body-in-White Structures Through Structural Intensity Analysis

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**Abstract :** The understanding of vibration propagation in complex structures such as automotive body in white remains a challenging issue in car design regarding NVH performances. The current analysis is limited to the low frequency range where modal concepts are dominant. Higher frequencies, between 200 and 1000 Hz, will become critical With the rise of electrification. EVs annoying sounds are mostly whines created by either Gears or e-motors between 300 Hz and 2 kHz. Structural intensity analysis was Experienced a few years ago on finite element models. The application was promising but limited by the fact that the propagating 3D intensity vector field is masked by a rotational Intensity field. This rotational field should be filtered using a differential operator. The expression of this operator in the framework of finite element modeling is not yet known. The aim of the proposed work is to implement this operator in the current dynamic solver (NASTRAN) of Stellantis and develop the Expected methodology for the mid-frequency structural analysis of electrified vehicles.

**Keywords :** structural intensity, NVH, body in white, irrotational intensity

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