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NUMERICAL AND EXPERIMENTAL EVALUATION OF MECHANICAL MOBILITY IN MULTI-POINT-CONNECTED STRUCTURES FOR POWER TRANSMISSION PREDICTION

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Estimating the vibro-acoustic behavior of complex mechanical structures can be very difficult, since several sub-structures and different types of vibration and noise sources may be involved. In particular, determination of the force transmitted through sub-structures for structure-born sound prediction requires the knowledge of mechanical mobility at the connecting points. The main aim of this paper is to investigate a simplified technique for coupling, in a suitable manner, individual mobilities of different sub-structures in order to evaluate the mechanical impedance of the whole structure at the connecting points. Based on the estimation of the combined mechanical mobility, the power transmitted from a sub-structure component to the others may then be evaluated, which in turn provides the input data needed for the estimation of the structure-born sound. Examples concerned with this type of analysis include large complex structures in which the power is transmitted from a vibrating machine (source) to a receiving structure (receiver) must be evaluated. The method is described and the experimental procedure illustrated in the case of mono-dimensional (beam) and two-dimensional (plate) substructures connected to vibrating masses.