

The uncertainty budget of Mixed-Numerical-Experimental-Techniques for the identification of elastic material properties from resonant frequencies.

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Abstract

The elastic properties of homogeneous, linear-elastic materials can be identified using resonant vibration analysis. Several sources of uncertainty contribute to the combined uncertainty of the measured values. This paper presents a method to handle uncertainty budgets in vibration based mixed numerical-experimental identification techniques. The presented method is evaluated with two numerical test cases. The first example considers an isotropic material, and allows to compare the presented method with the method proposed in the UNCERT Code of Practice 13 [1]. The second example considers the uncertainty budget of the identification of a coated steel plate.