ISNVH

June, 2020

Place:

Graz, Österreich

Title:

A bridging technology to combine test and simulation with *in-situ* TPA

Author:

Matthias Wegerhoff, Roland Sottek, Haiko Brücher

Abstract:

To shorten development processes and to secure decisive product properties as early as possible, new methods are required for product development. These must be able to generate the maximum information about the future product out of the data available at the respective development step. Computer-aided engineering (CAE) is therefore becoming increasingly important. CAE makes it possible to predict product properties at an early development stage and to partly replace physical prototypes with numerical models (virtual prototypes). However, the transition from experiment-based methods to numerical approaches is a big step. Often, purely-numerical examinations are only possible to a limited extent because of the following reasons: complex modeling, missing data or input data with major uncertainties, lack of expertise, or development processes not suitable for numerical methods. Therefore, this paper addresses a "bridging technology" that combines the advantages of experiment-based and numerical methods and allows optimal evaluation of the properties of the product to be developed. For this purpose, an exciting subsystem with its structural dynamics is represented by Equivalent Forces (EF) determined based on measured accelerations and by exploiting the *in-situ* TPA method. In general, the EF are independent of the support structure (e.g., test bench, application environment) of the subsystem. By coupling the EF into a structural dynamic simulation model, the radiation of the receiver structure is predicted and auralized.

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