

Frequency response function (FRF) based updating of a laser spot welded structure

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ABSTRACT

The objective of this paper is to present frequency response function (FRF) based updating as a method for matching the finite element (FE) model of a laser spot welded structure with a physical test structure. The FE model of the welded structure was developed using CQUAD4 and CWELD element connectors, and NASTRAN was used to calculate the natural frequencies, mode shapes and FRF. Minimization of the discrepancies between the finite element and experimental FRFs was carried out using the exceptional numerical capability of NASTRAN Sol 200. The experimental work was performed under free-free boundary conditions using LMS SCADAS. A vast improvement in the finite element FRF was achieved using the frequency response function (FRF) based updating with two different objective functions proposed.

KEYWORDS:

Frequency response function (FRF); Laser spot; Finite element (FE)