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# Comparisons of SHM Sensor Models with Empirical Test Data for Sandwich Composite Structures

This paper reports on analytical work, as well as experimental testing, that were accomplished at the Ames Research Center and at the Marshall Space Flight Center to examine acoustic wave propagating and the ability to detect intrinsic faults in sandwich type composite structures. Sandwich type composites are being studied for use in NASAs new heavy lift launch vehicle and flaw detection is crucial for safety and for failure prognostics. The work reported on in this paper involved both the theoretical modeling as well as comparison with empirical testing needed to answer the question of feasibility for reliable, and accurate, structural health monitoring (SHM) in the composite structure of interest. The analytical model of the transient wave propagation and scattering based on the Mindlin plate theory was developed. A scattered transient field properties are calculated theoretically using this model and numerically using the finite element model for acoustic waves generated by an acoustic-patch actuator. It is shown that theoretical results are in agreement with the results of numerical simulations and with experimental results.

**Ключевые слова:**

**Содержание.**
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