



28th Aerospace Testing Seminar Abstract Submittal Form

Abstracts due September 13, 2013

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I. ABSTRACT TITLE (PLEASE ENTER ABSTRACT TITLE)

Force Limiting Vibration Tests Evaluated from both Ground Acoustic Tests and FEM Simulations of a Flight Like Vehicle System Assembly

II. ABSTRACT (PLEASE ENTER ABSTRACT OF 200 WORDS OR LESS. ENCLOSE ATTACHMENTS AS NEEDED)

Marshall Space Flight Center has conducted a series of ground acoustic tests with the dual goals of informing analytical judgment, and validating analytical methods when estimating vibroacoustic responses of launch vehicle subsystems. The process of repeatedly correlating finite element-simulated responses with test-measured responses has assisted in the development of best practices for modeling and post-processing. In recent work, force transducers were integrated to measure interface forces at the base of avionics box equipment. Other force data was indirectly measured using strain gauges. The combination of these direct and indirect force measurements has been used to support and illustrate the advantages of implementing the Force Limiting approach for equipment qualification tests. The comparison of force response from integrated system level tests to measurements at the same locations during component level vibration tests provides an excellent illustration. A second comparison of the measured response cases from the system level acoustic tests to finite element simulations has also produced some principles for assessing the suitability of Finite Element Models (FEMs) for making vibroacoustics estimates. The results indicate that when FEM models are employed to guide force limiting choices, they should include sufficient detail to represent the apparent mass of the system in the frequency range of interest.

III. SESSION (S) (REFER TO THE CALL FOR PAPERS FOR SESSION DESCRIPTIONS & INDICATE THE PRIMARY SESSION THAT MOST IDENTIFIES WITH THE WORK. PRIORITIZE THE SESSIONS, UP TO 3 USING THE FOLLOWING SCALE:

PRIMARY SESSION = 1, SECONDARY SESSION = 2, ALTERNATE SESSION = 3)

<input type="checkbox"/> Testing Challenges for Human Space Exploration	<input type="checkbox"/> Strategies and Methodologies
<input type="checkbox"/> Test and People Management	<input type="checkbox"/> Innovations in Test Facilities and Equipment
<input type="checkbox"/> Test Effectiveness and Standards	<input type="checkbox"/> Instrumentation, Data Acquisition and Evaluation
<input type="checkbox"/> Ground Segment Test	<input checked="" type="checkbox"/> Modeling, Analysis, and Simulation

IV. COMMENTS (PLEASE ENTER ANY COMMENTS INCLUDING CO-AUTHORS)

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V. ADMIN ONLY-DO NOT COMPLETE THIS SECTION

Date Received:
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