

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Structures I - Development and Verification (Space Vehicles and Components) (1)

Author: Dr. Yuanjie Zou
China Academy of Space Technology (CAST), China, zyuanjie@yahoo.com.cn

Dr. zengyao han
China Academy of Space Technology (CAST), China, hanzengyao@hotmail.com

RESEARCH ON THE RANDOM VIBRATION SPECIFICATION BASED ON THE HYBRID FE-SEA
METHOD

Abstract

It is tremendously hard for engineers to specify an appropriate random vibration test input for assemblies and subsystems, because of the complex analysis of broadband loads and the uncertain requirement of workmanship screen. In this paper, a new technique based on the hybrid FE-SEA method is applied in the prediction of random vibration environment, and the process of determining the random vibration specification is described with examples. First, the formulation of the hybrid FE-SEA method is introduced briefly. Then, the power spectral densities of random vibration for assemblies are computed by FE-SEA method under the combined loads of direct mechanical vibration input and the acoustic loads. Finally, the process of specifying random vibration test input for assemblies with the consideration of the prediction results and the workmanship screen requirement is elaborated on. It is concluded that FE-SEA is a more efficient and accurate method than FEA and SEA in the prediction of assembly responses under complex loads, and it is conveniently applied in the process of specifying the random vibration input.