

## Controlled Shock Response Spectrum Test on Spacecraft Subsystem Using Electrodynamic Shaker

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**Abstract :** Shock Response spectrum (SRS) tests are one of the tests that are conducted on some critical systems of spacecraft as part of environmental testing. The SRS tests are conducted to simulate the pyro shocks that occur during launch phases as well as during deployment of spacecraft appendages. Some of the methods to carryout SRS tests are pyro technique method, impact hammer method, drop shock method and using electro dynamic shakers. The pyro technique, impact hammer and drop shock methods are open loop tests, whereas SRS testing using electrodynamic shaker is a controlled closed loop test. SRS testing using electrodynamic shaker offers various advantages such as simple test set up, better controllability and repeatability. However, it is important to devise a a proper test methodology so that safety of the electro dynamic shaker and that of test specimen are not compromised. This paper discusses the challenges that are involved in conducting SRS tests, shaker validation and the necessary precautions to be considered. Approach involved in choosing various test parameters like synthesis waveform, spectrum convergence level, etc., are discussed. A case study of SRS test conducted on an optical payload of Indian Geo stationary spacecraft is presented.

**Keywords :** maxi-max spectrum, SRS (shock response spectrum), SDOF (single degree of freedom), wavelet synthesis

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