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STRUCTURAL ANALYSIS OF A FINITE ELEMENT MODEL OF 3U CUBESAT FOR LOW EARTH ORBIT EXPLORATION

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The predicting of the structural responses of modern spacecraft subsystems with compact configuration is a complicated and interdisciplinary problem. So, the structural analysis of dynamic systems is of great interest to determine the natural frequencies, the stress induced, the deformation during the system operational life to at the corresponding mode of vibration, and to ensure that the overall coupling frequency is well out of the prohibited zone. This paper deals with the structural design of a modular 3U CubeSat for the Low Earth Orbit exploration. A unified finite element model was used in all associated structural analyses. All subsystems were modeled as remote masses at their center of gravity positions, considering their moments of inertia. The worst-case harmonic, buckling, shock and random vibration along with modal analyses have been performed on the CubeSat platform in order to ensure that the satellite could withstand the various loading conditions from the Iranian Space Research Institute experimental data during the launch.

BIOGRAPHY

Milad Azimi is currently a faculty member in the Aerospace Research Institute (Ministry of Science, Research and Technology) and part of the system architecture team for a CubeSat satellite program with more than 10 years' experience in mechanical and aerospace engineering. He has extensive experience in various aspects of spacecraft design and systems engineering. Successful contribution in quality management, project management, product-development life cycle methodologies. Dr. Azimi specializes in spacecraft and subsystem design, system analysis and modeling. His research interests are dynamics and control of space vehicles, robust control, nonlinear systems, smart structure and materials, vibration control, micro/nano satellite design and structural dynamics and experimental dynamics.

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