

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

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CUBESAT SYSTEM STRUCTURAL DESIGN

**Abstract**

This work presents a cubesat metallic structure design, which considered a vitrocereamics coatings. Nowadays, existing commercial options of cubesat are available, nevertheless they do not solve all the requirements for a specific mission. Therefore, it is proposed to follow a design protocol to satisfy the structural requirements. This protocol has four stages: 1) planning and clarification, 2) conceptual design, 3) preliminary design and 4) detail design. Thereby, it is described the structural dynamics as a consequence of the induced loads by the launch vehicle. Also, it includes a verification process that assess numerical simulations performed using ANSYS, such as convergence analysis. The results are presented in two parts: 1) the metallic structure geometry and 2) behavior evaluation on special-mechanics loads conditions, which must to bear. This evaluation is supported by statics, modal harmonic response, random vibration and response spectra analysis. Finally, according the proposed protocol, a metallic structure was obtained, which complies with the requirements and specifications defined by the first stage of the design protocol allowing the integration with other cubesat subsystems.