IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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DESIGN STRUCTURE, DYNAMIC STRUCTURE SIMULATION AND THERMAL SIMULATION OF SURYA SATELLITE-1

Abstract

Many countries in the world that make nanosatellite experiments need certain requirements. Surya Satellite-1 (SS-1) is the first satellite made by student in Surya University, Indonesia. The development of nanosatellite costs cheaper and faster compared to the large satellites. Surya Satellite-1 team is offered by JAXA (Japan Aerospace Exploration Agency) and all the nanosatellite manufacture refer to ICD (Interface Control Document) obtained from JAXA. The establishment of Surya Satellite-1 is also built on the provision of JAXA. The range of specifications and requirements determined by the JAXA space agency is 1U (100mm x 100mm x 113.5mm) at least 0.13KG and a maximum of 1.33KG, with a center of gravity not exceeding 2 centimeter from the midpoint of nanosatellite geometry. In this case, these are the requirements of the main structure above less than 10 millimeter on the surface. This work presents a Surya Satellite-1 structure design, manufacture and will also discuss about the results of simulation. Therefore, the Surya Satellite-1 structure design stages includes: planning and conceptual design, engineering model design, and flight model design. Dynamic structure simulation which includes: static analysis, natural frequency, random vibration and quasi-static analysis. The thermal simulation discuss will be related to thermal environment, thermal equilibrium, and operating temperature limitation. Finally, this research will produce the design of Cube Satellite structure that meets the ICD requirements, JAXA.