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DESIGN AND DEVELOPMENT OF STRUCTURAL SUB-SYSTEM FOR TWIN NANO-SATELLITE  
"STUDSAT-2"**Abstract**

This paper describes the design and development of mechanical structure for a Twin Nano satellite named as "STUDSAT- 2". Two "STUDSAT-2" Nanosatellites are designed and developed, each having dimensions of(300\*300\*200) mm. The mechanical structure of the STUDSAT-2 should be able to withstand all the launch loads exerted on it during the launch phase and separation of the twin satellites. The structure has to accommodate the payloads like camera, battery unit, printed circuit boards, gyroscope, magnetometer, magnetic torque coils, reaction wheel and GPS module. It has to support two deployable solar panels and the separation system. The material used for the primary structure of the satellite is Aluminium 6061-T6. The weight of each individual structure should be maintained within 2 kgs and should have an overall weight of 10kgs including all the payloads and the insulating panels. Different alternatives for the mechanical structure have been considered and analysed for the Nano satellite "STUDSAT-2". A structure that satisfies the above mentioned constraints have been considered for the Nano satellite. Solar panels form the most important part of the satellite. The major design challenge in STUDSAT-2 is to design a mechanism that is stable and withstand the vibrational effect and operate in space after the launch. Different alternatives for solar panel deployment mechanism were designed and analysed and a solar panel deployment system is selected which satisfies its functional requirement in the Nano satellite "STUDSAT-2". Antenna deployment mechanism is another crucial system in the Nano satellite since it establishes communication with the ground station. The various factors considered in the design are the forces experienced by the antenna, the elastic limit of the material, its electrical conductivity, the mounting requirement, fabrication, mass of the mechanism and availability of material. The design and

analysis of antenna deployment mechanisms which satisfy the above constraints are in progress.