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SPACE POWER SYMPOSIUM (C3)
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Siddaganga Institute of Technology, India, tcm_sit@yahoo.co.inPOWER SYSTEM FOR TWIN NANO-SATELLITE BASED ON ATTITUDE DETERMINATION AND
CONTROL SYSTEM**Abstract**

The STUDSAT 2A/2B is a twin nano-satellite, each weighing about 5.5 kg with solar panel deployment mechanism. The backbone for successful working of a satellite is the power system. The solar arrays are mounted on both the surface of the deployable panel which helps to generate power from direct sun rays and also from albedo rays of the earth thus reducing the eclipse period by 15%. For adequate generation of power, solar panels must be always oriented towards the sun in the orbit; if any change in the attitude occurs it affects the power generation and reduces the lifespan of the spacecraft. The designed attitude determination and control system consists of a 3-axis gyro sensor, magnetometer, and sun sensor for attitude determination and a set of reaction wheels and magnetic torquer coils for actuation. As the gyro sensors and magnetometers are MEMS based, they are prone to inconsistency due to varying temperatures, noise and integrating bias. This is compensated by using bias compensation algorithms, Kalman filters and B-dot control algorithm for accurate measurement and actuation control. The combination of three attitude sensors monitors the changes in attitude and actuators provide required pointing accuracy. The STUDSAT 2A/2B has power limitations and this power system is designed to overcome the above mentioned points within the constraints on size, cost and performance.