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IMPLEMENTATION OF MR SENSORS FOR ATTITUDE CONTROL ON UCLSAT FOR THE QB50 MISSION

Abstract

The paper is intended to design and carry out hands-on testing of the MR sensors for ADCS of UCLSat. UCLSat is one of the 50 CubeSats that will be launched as part of the QB50 constellation project. The aim of the project is to study in situ the temporal and spatial variation of a number of key constituents and parameters in the lower thermosphere (90-320 km).

The attitude, Determination, and Control Subsystem (ADCS) of UCLSat has three main parts : sensors which consist of magnetometer, MEMS rate sensor, CSS, sun sensor, and nadir sensor; ACP (Attitude Control Processor); and actuators which consist of magnetorquer, and momentum wheel. The scenario of the simulation is to obtain the output data of MR sensors for input data of ACP. Following this process, the simulation will be run to validate the control laws.

Therefore, the MR sensors output data will be utilized for ADCS requirements. For the future development, the simulation and testing of magnetic disturbance from ADCS components will also be conducted.