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THE DESIGN AND CALIBRATION OF A LOW-COST INTEGRATED ATTITUDE SENSOR UNIT

Abstract

This paper describes the principle, design, characterization and calibration of an integrated attitude sensor unit, which is used for the attitude measurement of CubeSats. Instead of normally one, this unit integrate an analog sun sensor, a three-axis gyro, a three-axis magnetometer, a three-axis accelerator and a low power processor into a whole system. The attitude information computed out by the processor is read from the external IIC bus. This unit has the advantages of small size ($30 \times 12 \times 7mm^3$), low weight (8gr.), large field of view (greater than $\pm 60°$), low power consumption (lower than 8mW), low cost, high efficiency, stable and reliable, and its signal is not susceptible to interference from other components. In order to measure the actual performance of the unit, the relevant experiments are executed. The test shows that the sensor unit is efficient and promising for CubeSats.