

A 3 axis satellite attitude control using CATCS.

Abstract

A 3-axis attitude control for a small satellite using combined attitude and thermal control system (CATCS) is presented in this paper. The CATCS system is designed to couple the attitude and the thermal control systems in one system. The CATCS principle is based on the use of the onboard excess heat to circulate a fluid inside a closed duct under the influence of generated current and magnetic flux fields. Till to date, the use of CATCS has been demonstrated for a single axis attitude control of a small satellite. The complete onboard 3-axis attitude control architecture based on the PI-controllers is implemented and numerically tested to enhance the closed-loop attitude control response of a satellite. The simulated attitude performances show that the CATCS system is able to perform the 3-axis attitude control of a satellite.

Keyword: CATCS; Satellite Attitude Control; Spacecraft; Attitude control; thermal control.