

The study of gravity gradient effect on attitude of low earth orbit satellite

Abstract

Simulations and mathematical models are increasingly used to assist the process of decision making in engineering design. The objective of this paper is to simulate the linear attitude dynamics of small satellites under gravity gradient torque which is inherent in low earth orbit. The equations were first derived in their nonlinear form, and then manipulated and simulated in their linear form. Simulation results demonstrate the importance of choosing the appropriate values of satellite's moment of inertia in designing phase of a satellite.

Keywords

Gravity gradient torque; Linear model; Low earth orbit; Satellite's attitude; Small satellite