

THERMAL ANALYSIS OF A MICRO-SATELLITE IN A LOW EARTH ORBIT

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Abstract

The thermal design of a micro-satellite is presented in the paper. The theoretical studies are carried out to describe briefly the relationship among various design orbital parameters and are depicted graphically. Solar heating on a micro-satellite is considered as a thin walled circular cylinder rotating with uniform speed about its geometric axis is analyzed for a situation in which heat transfer by convection and heat exchange within the cylinder is negligible. The nonlinear ordinary differential equations for the thin walled cylinder are solved using fourth order Runge-Kutta method to compute temperature distribution. The results of the analysis are presented at various revolution per minute RPM of the micro-satellite. Radiation heat transfer inside the package is analyzed with networking method.