IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Environmental Effects and Spacecraft Protection (6)

Author: Mr. Ali Alzaabi
Mohammed Bin Rashid Space Centre (MBRSC), United Arab Emirates, ali.alzaabi@mbrsc.ae

HEATING OF TELESCOPE STRUCTURE DUE TO REFLECTED SUNLIGHT FROM TELESCOPE OPTICS

Abstract

During Remote Sensing Satellite (RSS) mission, there are several abnormal cases where the satellite attitude control is non-operational. The exposure of a space telescope to the sun may result in certain structures or components within the system to be exposed to focused sunlight from the telescope optics. The effect of focused sunlight on the telescope structure or electronics is studied in order to determine the telescope survivability in orbit where the attitude is not controlled as usual. By utilizing radiometry, it is possible to calculate the total solar flux that the telescope is exposed to from the sun radiance. The total solar flux is calculated on different critical components by considering the magnification factor of each optics. The telescope parameter such as EFL, mission orbit altitude and satellite minimum spin speed as well as the duration the telescope is exposed to the sun is considered as critical parameters in order to calculate the solar flux. Based on the analysis, it can be concluded that a telescope in space when exposed to sunlight for a prolonged period of times could result in a mission failure.