IAF SPACE POWER SYMPOSIUM (C3)
Advanced Space Power Technologies (3)

Author: Mr. Hasan Mayditia
Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia, hsn.mayditia@gmail.com

Mr. Poki Agung Budiantoro
Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia, pokiagung@gmail.com
Dr. Ery Fitrianingsih
Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia, ery_fitrianingsih@yahoo.com
Mrs. Desti Ika Suryanti
Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia, desti.ika@lapan.go.id

SOLAR PANEL DESIGN AND ANALYSIS OF EQUATORIAL LEO MICROSATELLITE

Abstract

The design of a satellite power system, specifically solar panel is highly determined by the orbit at which the satellite is operated. Due to the variation of the sun angle, equatorial orbit might require a bigger area of solar panel or an even more complicated sun-tracking solar wing. Moreover, the configuration of other subsystems compromises the optimum design of the solar panel. In the case study of LAPAN-A5, an equatorial LEO microsatellite, the specific challenge of the power system design came from the multiple communication frequencies used by the payload and TTC. At least 10 different antennas are required which significantly reduces the available area for the solar panel. This paper studies the possible configurations of the solar panel which could satisfy the design requirements of LAPAN-A5. Four different configurations of solar panel will be analysed in depth utilizing IDM-CIC, a simulation software developed by CNES. The configuration options are body-mounted solar panels, deployable solar panels, a combination of body-mounted and deployable solar panels, and sun-tracking solar panels. The result of the analysis provides a recommendation of the optimum solar panel configuration to be implemented on LAPAN-A5.