SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Fixed and Broadcast Communications (1)

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REDUNDANT OPTICAL LINK FOR TELEMETRY SYSTEMS TO SATELLITES IN GEOSTATIONARY ORBIT

Abstract

The purpose of any communication system to is maximize the speed of data transfer and minimize hardware limitations, price and power consumption. In the satellite systems geostationary orbit, the need for systems redundant communications arises due to the large number of other satellites that are in this orbit and are also constantly exposed to extreme conditions such as the huge temperature changes, exposure to solar explosions, modification or disruption of its orbit, among others, all of this sometimes causing failures in communication or some information loss. Such communication systems require frequency bands of the radio spectrum for contact with the ground control centers to obtain telemetry information and make decisions about possible bug fixes. Currently, the way to obtain these data is based on the use of wireless communications in the S band (2120 - 2025 MHz and 2200 - 2300 MHz for telemetry). This type of communication must be reliable and always be available. Optical Communications represent an alternative to achieve a communication link between satellite and control center for telemetry aspects, taking into account advantages in using these links as a higher transmission speed, unidirectional links (direct satellite footprint to earth stations control), high immunity to interference, low bit error rates, plus they do not pose a health risk. This article shows a proposed satellite system in geostationary orbit with optical links and their evaluation through the simulation of it to achieve having a transmission with reliability in excess of 99%, besides proposing some uses for the bandwidth that would be released considering implementing the system.