

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

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SPACE ENVIRONMENTAL ISSUES IN DEVELOPING WIRELESS SMALLSAT DATA BUS

Abstract

As the demand for smaller and more economical, efficient and complex spacecraft increases the need for small and efficient spacecraft is also on the rise. The progress of the above mentioned standards in terms of speed and data load has been impeded by their physical and mechanical constraints. One effective solution recently proposed has been the use of a wireless bus, more specifically a Bluetooth communication bus, to reduce both the volume and complexity of design, while maintaining the integrity of the design and even improving upon current standards. Some of the implications of this would be reduction of at least 10

Some of the issues that need to be addressed include solar and cosmic radiation and their effects on the physical wireless equipment such as inter-spacecraft communication antennas, software and hardware based interference and jitter management and security implications posed by the space environment and intentional human interference. This discussion is enforced by the modeling of LEO radiation environment as pertained to a Bluetooth bus and will be followed by computational simulation to support future ground-based experimental testing. The development standard will include the environmental simulation and detailed descriptions of parts and components selection, interface design, environmental test and the engineering resolutions.