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Author: Mr. Abdul Lawal
University of Glasgow, Space Advanced Research Team, United Kingdom

Ms. BLESSING ZINOM
National Space Research and Development Agency (NASRDA), Abuja Nigeria, Nigeria

PERFORMANCE ANALYSIS OF SMALL SATELLITES COMMUNICATION LINK FOR
NEAR-EARTH AND SPACE EXPLORATION**Abstract**

The basic and future benefits for venturing into Space Exploration is enormous and a life time achievement. Generally designing high performance Space Systems for Deep Space/Interplanetary missions and Space Exploration is of a great task, as it counters most possible challenges foreseen in the near future space technology. When designing a Communication system for terrestrial and Satellite Communications it is less challenging than that of deep space missions etc, especially in Space-to-Earth (Downlink) Data Communication. A standard Communication Link Design for Deep Space missions encounters limitations such as long range of transmission, high signal propagation delays, very low signal to noise ratio, high Data corruption rates etc. When Designing a Communication Subsystem for Small Satellites (Micro, Nano, Pico etc), it is always a huge task because required design specification and mission requirements needs to be achieved especially when it comes to power and Data Rate. These paper analysis technologies for designing a Communication Channel System that suits Interplanetary Missions and also for Space Exploration in other to counter the possible challenges expected in Space Technology for the near future. Correction Techniques for the Design of a standard Communication Channel Structure will be discussed in this paper. The Technology and Design evaluates the Communication Channel Structure with concentrations on the Communication Channel Structure Mechanisms like Coding/De-Coding, Modulation/De-modulation, Satellite Channel, Noise etc. The analysis will be carried out on distances between the Earth and other planet i.e. Moon, Mars etc. Furthermore, a Performance analysis will be carried out to justify the Communication Channel Structure System as regards to Data Rate and Required Power. Also the work suggests various criteria such as power requirements, antenna size and frequency, to be considered when designing a Communication Subsystem for Small Satellites for deep space Missions and space Explorations in general