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KEY TECHNOLOGIES ANALYSIS AND SYSTEM SCHEME DESIGN FOR LUNAR-EARTH LASER COMMUNICATION

Abstract

Laser communication offers a significant advantage over radio frequency communication due to the higher frequency of optical wave. It has the potential to enable higher data rate with reduced size, weight and power (SWaP) burden on a spacecraft for deep space missions. This paper analyzes the characteristic of lunar-earth laser link and discusses the main factors and key technologies which restrict the performance of the link. Then, a system scheme design for lunar-earth laser communication has been presented and the performance of the system has been simulated. As the result, the data rate of downlink is up to 100Mbit/s at Bit Error Rate (BER) of 10-6.