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VISIBLE LIGHT COMMUNICATIONS ON SPACECRAFT

Abstract

The promising visible light communication (VLC) based on white light emitting diode (LED) technology has gained great attention due to its unique advantages. Its high frequency response of LED enables the capacity to fulfill the functions of illumination and communication at the same time. Because of the absence of the air, communication in the space between astronauts outside spacecraft cannot be directly supported. Here we demonstrate a portable VLC system for real-time long distance audio communication (over 50m) and video communication(over 5m), which is of great interest for use for space communication. VLC explores the unregulated visible light spectrum, and doesn't create electromagnetic interference (EMI) and also be free of EMI, which enables data communication in environments where radio frequency communication isn't allowed. Thus, radio wave signal transmitted from headquarters on ground can be superimposed on ceiling light of cabin,affording a kind of stable and high speed environmentally communication pattern. In this paper, emerging research spots of VLC application on spacecraft are identified and discussed. The experimental results and the relationship between system transmission eye diagram and bit rate are also be shown.