

# Single carrier optical FDM in visible light communication

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## Abstract

Light emitting diodes (LEDs) used in visible light communications (VLC) have a limited optical power-current linear range, which could be a problem in multi-level and multi-carrier frequency modulation schemes. Orthogonal frequency division multiplexing (OFDM) as a popular scheme in VLC suffers from nonlinear distortion due to the high peak to average power ratio (PAPR). In this paper, we present a novel single carrier optical frequency division multiplexing signaling scheme for VLC, where the symmetrical characteristics of single carrier frequency division multiple access is investigated in order to reduce PAPR. Simulation results show that PAPR reduced by 10 dB compared to the traditional asymmetrically clipped optical OFDM. We show that the bit-error-rate performance of the proposed scheme is enhanced compared to ACO-OFDM when the limited dynamic range of digital to analog converter and LED is considered.

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