

LiFi: The Solution to Radio Frequency Saturation

LED-based lighting is rapidly replacing conventional incandescent and fluorescent lighting due to its high energy efficiency and long usage cycle. Visible Light Communication (VLC) and Light Fidelity (LiFi) have extended this usefulness to the transmission of data, due to LEDs' capability for high rates of intensity modulation. In this paper, we give an overview of the frontend elements and propagation channel of a LiFi Attocell (LAC) Network, and discuss LiFi as an indoor complement to RF communications. MATLAB simulation results are presented to depict the distribution of illuminance and received power in the line-of-sight (LOS) and non-line-of-sight (NLOS) channels. The deterministic channel impulse response (CIR) calculation method is used to obtain our power values. The results show that average received power values of -3.87dBm and 2.28dBm in the downlink channel are possible at standard indoor illumination levels. Based on comparisons with the -83.3dBm received power of user equipment (UEs) at 100m in a 5G system and the properties of radio waves, we show that LiFi can serve as a complementary technology to RF communications and surpass some of its limitations.

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