

## ABSTRACT

As well as lighting purpose, an LED lamp can be utilized for communication. A communication system that uses electromagnetic wave with frequencies within the visible light spectrum is called Visible Light Communication (VLC).

Fiber to the Home is an access network with optical fiber as medium of transmission. It terminates at optical network terminal (ONT) that resides at subscriber's home. Receiver devices are connected to the Internet through Wi-Fi signal transmitted from access point antenna. The antenna function could be substituted with a VLC system deployed at home.

Adoption of wavelength division multiplexing (WDM) concept to VLC may result in communication system capacity increase. This research attempts to analyze a scheme to transmit FTTH downlink signal of 1550 nm wavelength through three visible light channels of red, green, and blue from RGB LED, respectively 630 nm, 525 nm, and 460 nm. At FTTH receiving end, the *bit error rate* (BER) is  $1.37e-010$ . BER performance scores of WDM VLC channels comprising color red, green, and blue are respectively  $3.8534e-005$ ,  $5.5153e-005$ , and  $9.4600e-005$ . The designed communication system reported in this work scored lower than  $3.8e-003$  BER, i.e.  $1.88287e-004$ .

**Key Words :** *Visible Light Communication, WDM VLC, Fiber to the Home, access network, optical wireless communication.*