

## Effects of Incident Angle and Distance on Visible Light Communication

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**Abstract :** Visible Light Communication (VLC) provides wireless communication features in illumination systems. One of the key applications is to recognize the user location by indoor illuminators such as light emitting diodes. For localization of individual receivers in these systems, we usually assume that receivers and transmitters are placed in parallel. However, it is difficult to satisfy this assumption because the receivers move randomly in real case. It is necessary to analyze the case when transmitter is not placed perfectly parallel to receiver. It is also important to identify changes on optical gain by the tilted angles and distances of them against the illuminators. In this paper, we simulate optical gain for various cases where the tilt of the receiver and the distance change. Then, we identified changing patterns of optical gains according to tilted angles of a receiver and distance. These results can help many VLC applications understand the extent of the location errors with regard to optical gains of the receivers and identify the root cause.

**Keywords :** visible light communication, incident angle, optical gain, light emitting diode

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