

# Construction of Optical ZCZ Sequence Set with the Zero-Correlation Zone $2^Z$ Suitable for PPM-OCDMA System

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**Abstract**— In this paper, we propose a new generation method of optical zero-correlation zone (ZCZ) sequences suitable for the optical code division multiple access with pulse position modulation (PPM-OCDMA) system. The proposed optical ZCZ sequence set has multiple ZCZ in the side lobes, and the interval of those ZCZs is equal. In addition, this ZCZ size can be easily extended. Because of these properties, the proposed optical ZCZ sequence is suitable for the PPM-OCDMA system. The PPM-OCDMA system using the proposed optical ZCZ sequence is expected to realize visible light communication that prevents illumination degradation which is a weak point of the general PPM-OCDMA system and is resistant to interference caused by wall reflections.

**Keyword**— optical wireless communication, optical zero-correlation zone (ZCZ) sequence, pulse-position modulation (PPM), visible light communication (VLC)

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