

## Zero Cross-Correlation Codes Based on Balanced Incomplete Block Design: Performance Analysis and Applications

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**Abstract :** The Zero Cross-Correlation (C, w) code is a family of binary sequences of length C and constant Hamming-weight, the cross correlation between any two sequences equal zero. In this paper, we evaluate the performance of ZCC code based on Balanced Incomplete Block Design (BIBD) for Spectral Amplitude Coding Optical Code Division Multiple Access (SAC-OCDMA) system using direct detection. The BER obtained is better than  $10^{-9}$  for five simultaneous users.

**Keywords :** spectral amplitude coding-optical code-division-multiple-access (SAC-OCDMA), phase induced intensity noise (PIIN), balanced incomplete block design (BIBD), zero cross-correlation (ZCC)

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