

Generalized Mutually Orthogonal ZCZ Sequence Sets Based on Perfect Sequences and Orthogonal Codes

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Abstract—The present paper proposes a new method for constructing mutually orthogonal zero-correlation zone (MO-ZCZ) sequence sets using perfect sequences, orthogonal codes, and an interleaving technique. Generally, an MO-ZCZ sequence set is composed of several ZCZ sequence sets, and two arbitrary sequences that belong to different ZCZ sequence sets have orthogonality. Each ZCZ sequence set included in the proposed MO-ZCZ sequence set is a quasi-optimal ZCZ sequence set. In addition, two arbitrary sequences that belong to different ZCZ sequence sets have not only orthogonality but also a zero-correlation zone of which the ZCZ length satisfies quasi-optimality. Consequently, the proposed MO-ZCZ sequence set can be regarded as a single quasi-optimal ZCZ sequence set. In this sense, the proposed MO-ZCZ sequence set can be regarded as a generalized version of conventional MO-ZCZ sequence sets.

Keyword— MO-ZCZ sequence sets, Quasi-optimal ZCZ sequence sets, Spreading sequences, AS-CDMA systems, Spread spectrum communication



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