

Bouns and Constructions for Optimal $(v, \{3, 4, 5\}, \Lambda_a, 1)$ -OOCs

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In 1996, Yang introduced variable-weight optical orthogonal code for multimedia optical CDMA systems with multiple quality of service (QoS) requirements. Let $W = \{w_1, \dots, w_r\}$ be an ordering of a set of r integers greater than 1, $\Lambda_a = (\lambda_a^{(1)}, \dots, \lambda_a^{(r)})$ be an r -tuple of positive integers (*auto-correlation parameter*), λ_c be a positive integer (*cross-correlation parameter*), and $Q = (q_1, \dots, q_r)$ be an r -tuple (*weight distribution sequence*) of positive rational numbers whose sum is 1. A $(v, W, \Lambda_a, \lambda_c, Q)$ variable-weight optical orthogonal code ($(v, W, \Lambda_a, \lambda_c, Q)$ -OOC) is a collection of $(0, 1)$ sequences with weights in W and other special properties. Some works had been done on the construction of optimal $(v, W, \Lambda_a, \lambda_c, Q)$ -OOCs with $\lambda_a^{(1)} = \dots = \lambda_a^{(r)} = \lambda_c = 1$, while not so much is known on variable-weight OOCs with unequal correlation constraints. In this talk, bouns and constructions for optimal $(v, \{3, 4, 5\}, \Lambda_a, 1)$ -OOCs will be presented.

Keywords: Cyclic packing, optical orthogonal code, unequal, variable-weight OOC.