A new code for optical code division multiple access systems

ABSTRACT

A new code structure based on Double-Weight (DW) code families is proposed for Spectral-Amplitude-Coding Optical Code Division Multiple Access (OCDMA) system. The constraint of a constant weight of 2 for the DW code can be relaxed using a mapping technique. By using this technique, codes that have a larger number of weight can be developed. Modified Double-Weight (MDW) Code is another variation of a DW code family that can has a variable weight greater than two. The MDW code possesses ideal cross-correlation properties and exists for every natural number n. A much better performance can be provided by using the MDW code compared to the existing codes such as Hadamard and Modified Frequency-Hopping (MFH) codes. This has been demonstrated from the theoretical analysis and simulation.

Keyword: Cross-correlation; Double weight (DW) code; Modified double weight (MDW) code; OSCDMA