A new family of optical code sequences for spectral-amplitude-coding optical CDMA systems

ABSTRACT

A new code structure for spectral-amplitude-coding optical code-division multiple-access system based on double-weight (DW) code families is proposed. The DW code has a fixed weight of two. By using a mapping technique, codes that have a larger number of weights can be developed. Modified double-weight (MDW) code is a DW code family variation that has variable weights of greater than two. The newly proposed code possesses ideal cross-correlation properties and exists for every natural number n. Based on theoretical analysis and simulation, MDW code is shown here to provide a much better performance compared to Hadamard and modified frequency-hopping codes.

Keyword: Cross correlation; Double-weight (DW) code; Modified double-weight (MDW) code; optical spectrum code-division multiple-access (OSCDMA)