

Performance enhancement of OCDMA system using NANDdetection with modified double weight (MDW) code for optical access network

Abstract

In this paper, we have extensively analyzed the OCDMA system performance using modified double weight (MDW) code with NAND detection technique as newly developed by the authors. In theoretical analysis, various noises and multiple-access interference (MAI) effect were taken into account. The system performance was characterized by the signal-to-noise ratio (SNR) and the bit-error-rate (BER). The analysis results obtained with NAND detection technique were compared with those as obtained with complementary and AND subtraction techniques. The comparison results revealed that the NAND detection technique with MDW code can support more number of active users and improve the system performance compared to complimentary and AND subtraction techniques. We also ascertained by simulation experiment that the BER performance of the system with NAND detection technique is greatly improved as compared to the complementary and AND subtraction technique.

Keywords

Modified double weight (MDW) code; Multiple-access interference (MAI); NAND/AND/complementary detection; Optical-code-division-multiple access (OCDMA)