Performance of random diagonal code for OCDMA systems using new spectral direct detection technique

Abstract

This paper studies the performance of random diagonal (RD) code for spectral-amplitude coding OCDMA (SAC-OCDMA) system using a newly proposed spectral direct detection technique. RD code is constructed using code segment and data segment. One of the important properties of this code is that the cross correlation at data segment is always zero, which means that phase intensity induced noise (PIIN) is reduced. The weight for the RD code can be any number greater than three. By comparing the theoretical and simulation results taken from the commercial optical systems simulator "$OptSim^{TM}$," we show that the proposed new spectral direct detection technique utilizing RD code considerably improves the performance compared with the conventional SAC complementary subtraction technique.