Performance analysis of hybrid SAC-OCDMA/WDMA system using Random Diagonal code

ABSTRACT

A hybrid Spectral-Amplitude-Coding (SAC) - Optical Code Division Multiple Access (OCDMA) /Wavelength - Division-Multiple-Access (WDMA) using Random Diagonal (RD) code is proposed in this paper. The RD code is used in the proposed system due to its receiver's flexibility. The system is simulated using OptiSystem software. In our proposed system, four users of WDMA system with bit rate of 10Gbps is coupled with users of OCDMA system performing on bit rate of 1.25Gbps. Comparing to hybrid SAC-OCDMA /WDMA using KS code, the proposed system offers better performance in term of lower code length and lower bit error rate (BER) at the expense of higher number of filters. The result also shows that the BER of nine RD users are maintained at not more than 10-9 up to 75 km.

Keyword: Optical Code Division Multiple Access (OCDMA); Random diagonal (RD); Spectral Amplitude Coding (SAC); Wavelength Division Multiple Access (WDMA)