

ABSTRACT

A non-coherent synchronous all-optical code-division multiple-access (CDMA) network is proposed. In this network, symmetric codes derived from prime sequence codes are used. We present the construction of symmetric codes and show that the pseudo-orthogonality of the new codes is the same as that of the original prime-sequence codes while the number of code sequences of the new codes is larger than that of the prime sequence codes and the modified prime codes in the same field $GF(p)$. Therefore, an optical CDMA LAN using symmetric codes can have a larger number of potential subscribers. The new codes allow designing fully programmable serial all-optical transmitter and receiver suitable for low-loss, high-capacity, optical CDMA LANs. It also shows that compared to systems using modified prime codes the proposed system can achieve better BER performance for low received chip optical power.

