

Reduction of Multiple User Interference for Optical CDMA Systems Using Successive Interference Cancellation Scheme

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Abstract : In Commonly, it is primary problem that there is multiple user interference (MUI) noise resulting from the overlapping among the users in optical code-division multiple access (OCDMA) system. In this article, we aim to mitigate this problem by studying an interference cancellation scheme called successive interference cancellation (SIC) scheme. This scheme will be tested on two different detection schemes, spectral amplitude coding (SAC) and direct detection systems (DS), using partial modified prime (PMP) as the signature codes. It was found that SIC scheme based on both SAC and DS methods had a potential to suppress the intensity noise, that is to say, it can mitigate MUI noise. Furthermore, SIC/DS scheme showed much lower bit error rate (BER) performance relative to SIC/SAC scheme for different magnitude of effective power. Hence, many more users can be supported by SIC/DS receiver system.

Keywords : optical code-division multiple access (OCDMA), successive interference cancellation (SIC), multiple user interference (MUI), spectral amplitude coding (SAC), partial modified prime code (PMP)

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