

光通信

基于相干光正交频分复用的WDM传输系统及其性能分析

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摘要: 相干光正交频分复用由于其良好的传输性能成为近年来光传输领域的研究热点, 波分复用技术可以在光纤中通过增加并行波长的数量来提高系统的容量, 将CO-OFDM和WDM技术结合, 可以构造出高速率、大容量、低成本的光传输网络。文章首先对基于CO-OFDM的WDM传输系统的理论模型和基本原理进行了研究, 然后对基于CO-OFDM的100Gb/s×32-信道WDM传输系统进行了仿真分析。并研究了该系统的传输性能。结果表明: 在没有任何光纤的色散及非线性补偿的情况下, 当信号速率为3.2 Tb/s时, 系统的Q因子高于16.0 dB, 在标准单模光纤中的传输距离可达1500km。

关键词: 光通信 相干光正交频分复用 波分复用 长距离传输

WDM transmission system derived from coherent optical OFDM and its performance analysis

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Abstract: Coherent optical orthogonal frequency division multiplexing transmission has got special attention in numerous studies due to its interesting and efficient transmission performance, wavelength-division multiplexing technology improves system capacity by increasing the number of parallel transmission wavelength in optical fiber, The combination of coherent optical orthogonal frequency division multiplexing and WDM technology in optical fiber communication has been able to build high speed rate, large capacity and low cost for optical transmission networks. In this paper applications of theoretical model and the basic principles of WDM system using coherent optical OFDM are studied. A simulation experiment of 100Gb/s×32-channel WDM transmission system has been derived from the coherent optical OFDM and the transmission performance of the system were studied. The simulation shows that the system Q of the WDM channels at 3.2Tb/s is potentially over 16.0 dB for a transmission up to 1500 km-long standard single mode fiber without any optical dispersion and nonlinear compensation.

Keywords: optical communication coherent optical OFDM WDM long-haul transmission

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