Research on improving the quality of WDM optical fiber communication lines using cascaded EDFAs

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Abstract: This topic focuses on researching and improving data transmission quality in Wavelength Division Multiplexing (WDM) optical transmission systems by applying cascaded Erbium-Doped Fiber Amplifiers (EDFAs). The context of the topic is set against the rapid growth in demand for high bandwidth on major communication routes, requiring performance improvements in existing optical transmission systems. The objective is to upgrade and optimize data transmission quality by integrating cascaded EDFAs into the WDM structure. The research methodology includes theoretical analysis of the operation of optical transmission devices, experimentation with the improved WDM system, and evaluation of the new performance. The expected results will provide application solutions for the information technology industry to enhance data processing capacity in modern optical transmission systems.

Keywords: Quality improvement, WDM, cascaded EDFA, optical transmission, optimization