

Abstract

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Gain and Noise Figure of EDFA and Hybrid EDFA/FRA in WDM Systems: A Comparative Study

Multimedia optical networks are the demands of today to carry out large information. Presently, wavelength division multiplexing (WDM) technology transmission of multiple channels over the same fiber is adopted to achieve this demand. While light pulses propagate along the optical fiber, their energy dissipates. Beyond a certain distance, the number of photons in pulses becomes too small to be detected. Optical amplifiers like erbium doped fiber amplifier (EDFA) and fiber Raman amplifier (FRA) are considered as one of the most important elements in technology for optical communication networks. The present study investigates the importance of the use of an EDFA and a hybrid EDFA/FRA in the WDM transmission systems. A comparative study is carried out showing that the hybrid EDFA/FRA is one of the promising technologies to provide a widened and flattened gain-bandwidth over the C-band (1530-1565 nm) with high gain and low noise figure (NF).