

# **Abstract**

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## **All Optical Broad-Band Multi-Raman Amplifier for Long-Haul UW-WDM Optical Communication Systems**

In the present paper, the problem of multi-pumping all Raman amplifier has been investigated to obtain a gain of maximum flatness over a wide range of optical signal wavelengths for long-haul ultra-wide wavelength division multiplexing (UW-WDM) transmission systems. Four cases are analyzed where, four, five, and seven Raman pumping of special pumping powers are launched in the forward direction. The model equations are numerically handled and processed. The gain is computed over the spectral optical wavelengths (1.45  $\mu\text{m}$  ? ?signal ? 1.65  $\mu\text{m}$ ).