

# **Abstract**

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## **Performance evaluation and enhancement of dense wavelength division multiplexing passive optical network DWDM-PON cross-seeding system with Rayleigh backscattering mitigation**

In this paper, a dense wavelength division multiplexing passive optical network (DWDM-PON) using cross seeding system is designed and evaluated. This system utilizes 16 channels with low channel spacing of 12.5 GHz. Upstream (US) capacity is enhanced to 2.5 Gb/s over 25 km single mode fiber (SMF) transmission. This optical network has a downstream (DS) capacity of 10 Gb/s. A noteworthy average bit error rate (BER) of  $10^{-13}$  is achieved during system evaluation process. A successful mitigation for Rayleigh backscattering (RB) is achieved comparing to conventional bidirectional wavelength division multiplexing passive optical network (WDM-PON).