

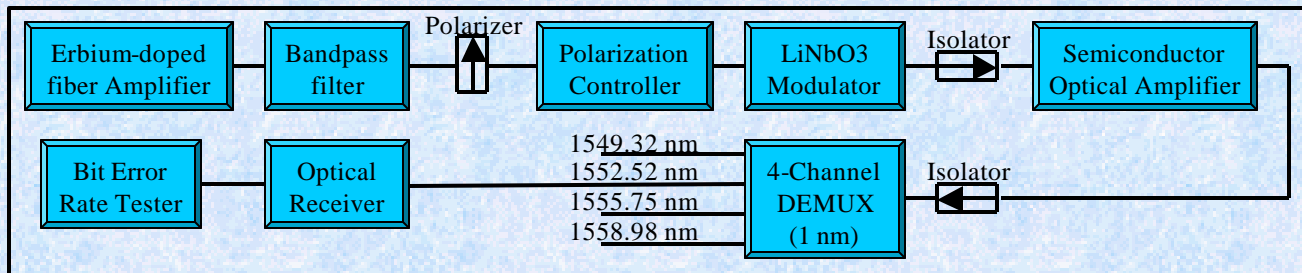


### Wavelength Conversion Technique Using the Spectrum-Sliced ASE of a Gain-Saturated SOA

Wavelength conversion is a desirable feature in WDM networks as it can be used to reduce the blocking probability in wavelength routed networks. Most current wavelength conversion techniques include Cross Gain Modulation and Cross Phase Modulation in Semiconductor Optical Amplifier (SOA) have a limitation that a laser is required to provide the probe beam and the pump signal can only be converted into the wavelength of the probe beam.

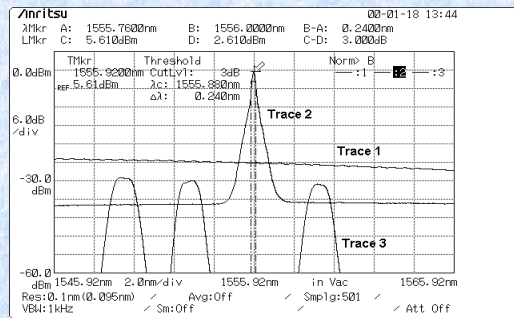


In this project, we demonstrate for the first time, a wavelength conversion technique using spectrum-sliced amplified-spontaneous-emission (ASE) of a SOA. When a modulated pump signal is fed into the SOA, the ASE spectrum of the SOA is being modulated. A demultiplexer (DEMUX) or a tunable filter can be used to slice the desired wavelength of the ASE spectrum. Hence, this technique allows pump wavelength to be converted into any other wavelength without using any probe wavelength.

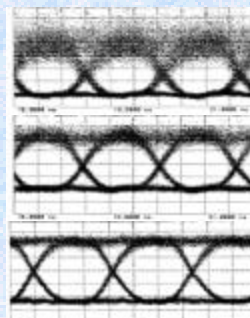


Schematic of the proposed wavelength conversion technique

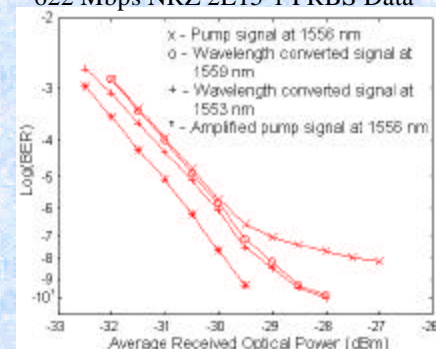
Measured Bit Error Rate curves at 622 Mbps NRZ 2E15-1 PRBS Data



Trace 1: ASE spectrum of SOA without input light  
Trace 2: Spectrum of SOA with input signal  
Trace 3: Spectrum-sliced of ASE at different output channel of AWG



Measured eye diagrams  
Top: Pump signal before the SOA at 1556 nm  
Middle: Wavelength converted signal at 1553 and 1559 nm  
Bottom: Amplified pump signal at 1556 nm



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