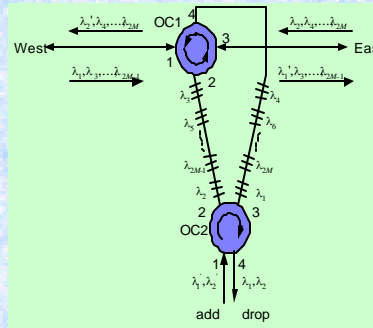




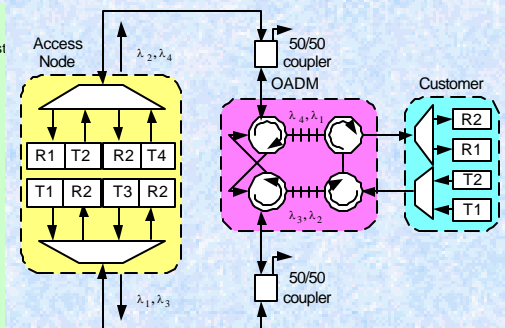
**Fibre Bragg Grating Based WDM Bidirectional Optical Add/Drop Multiplexer (OADM)**

**Introduction**

The most important component in a WDM distribution network is the passive bidirectional OADM. Results presented so far cannot provide protection function passively and therefore not suitable to distribution network. The use of tunable FBGs for the WDM bidirectional OADM has been proposed and successfully demonstrated.



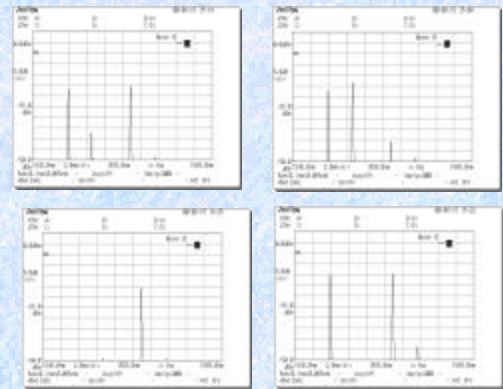
FBG-based bidirectional OADM.



Experimental setup.

**Studies**

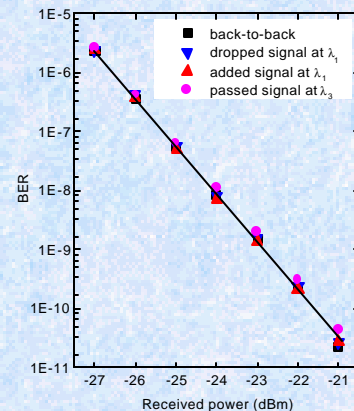
We proposed a novel bidirectional OADM, which is passive and offers low cost, loss insertion loss and protection function in a distribution network with only one fibre.



Optical spectra obtained at different locations.

**Results and Discussion**

A reciprocal four-port circulator (OC1) is used to transform wavelength  $\lambda_1, \lambda_3, \dots, \lambda_{2N-1}$  from West to East and to transform  $\lambda_2, \lambda_4, \dots, \lambda_{2N}$  in the opposite direction. Another nonreciprocal four-port circulator (OC2) is used to add/drop wavelengths to/from both directions. The optical spectra are obtained at different locations: (a) input to the OADM from the lower port; (b) output of the drop port; (c) output of the OADM from the upper port when no signal is added and (d) when local generated  $\lambda_1$  and  $\lambda_2$  are added. From the tested BER performance almost no sensitivity penalty is observed. When the signals, that transform in the opposite direction, are turn off. No changes in the BER is observed.



BER performance at 2.5Gb/s.

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