



Contribution ID: 251

Type: Oral Presentation

Novel Fibre Bragg Grating Based All Optical OADM for Flexible Spectrum Channel Reservation to Minimize Optical Cross Talk in WDM optical communication networks

Thursday, 11 July 2019 10:00 (20 minutes)

Flexible spectrum has been proposed as a spectrally efficient networking technology that effectively supports dynamically varying traffic demands. With the Wavelength division multiplexing (WDM) optical networks ability to provide increased capacity and efficient spectral resource utilization it can be used to reserve channels to improve the quality of service in big data transmission. Optical add-drop multiplexer (OADM) is key components for add or drop wavelengths in high bit rate optical networks providing channel reservation as a mechanism for minimizing optical cross talk. In this work, a Fibre Bragg Grating based OADM was developed and functionality was experimentally demonstrated for an OADM configured from an FBG fibre and two circulators. The vertical-cavity surface-emitting laser (VCSEL) was transmitted along the FBG engraved fibre as it can be tuned to lase at a wavelength satisfying the Bragg Conditions. as the FBG is mainly used in sensor application with less stringent requirements and in WDM systems the wavelength is specified. The OADM performance measurement in a 25 km single mode fibre transmission line, for 3×50 GHz channels wavelength division multiplexing (WDM) network are reported. Results show that quality of service measured as Bit Error Rate (BER) of the proposed OADM channel reservation are lower and provided better performance than the existing WDM optical networks. Furthermore, the OADM fulfils the full width at half maximum (FWHM) requirement for wavelength-division multiplexers (WDMs) according to the International Telecommunication Union (i.e., $\text{FWHM} < 0.4 \text{ nm}$).

Apply to be considered for a student award (Yes / No)?

no

Level for award (Hons, MSc, PhD, N/A)?

N/A

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Session Classification: Applied Physics

Track Classification: Track F - Applied Physics