Contribution ID: **103** Type: **Oral Presentation**

Spectral Resource Management based on VCSEL Wavelength Switching and Allocation

Tuesday, 26 June 2018 10:00 (20 minutes)

Emerging high bandwidth demanding applications such as cloud computing, 5G wireless, wearable devices for health monitoring and high definition video streaming has brought about a rapid growth of Internet traffic. This calls for upgrade of the traditional fixed grid wavelength division multiplexing (WDM) system, to improve capacity, reliability, cost and simplicity in the network through spectrum flexibility and cost effective sharing of fibre links, transmitters and receivers. Spectrum slicing into fine granular sub carriers and assigning a number of frequency slots to accommodate diverse traffic demands is a viable approach. This work experimentally presents a technique for bandwidth variability and wavelength selective switches in the nodes of a network, capable of removing the fixed grid spacing. We present wavelength switching using a low cost, high bandwidth and power efficient vertical cavity surface emitting laser (VCSEL) wavelength tenability property. In this study, the driving current of a 1550 nm VCSEL is varied from (2 mA to 8 mA), therefore attaining different channel spacing 0.8 nm (100 GHz), 0.4 nm (50 GHz), 0.2 (25 GHz), 0.1 nm (12.5 GHz) and 0.05 nm (6.25 GHz) at over a constant wavelength range of 5 nm. The majority of the spectrum was utilized at finer channel spacing, wastage of the spectrum resource as caused by the wavelength continuity constraint was reduced and bandwidth utilization was improved.

Please confirm that you
have carefully read the
abstract submission instructions
under the menu item
”Call for Abstracts”
(Yes / No)

yes

Consideration for
student awards
Choose one option
from those below.
N/A
Hons
MSc
PhD

N/A

Supervisor details
If not a student, type N/A.
Student abstract submision
requires supervisor permission:
please give their name,
 institution and email address.

Timothy Gibbon
Nelson Mandela University
tim.gibbon@mandela.ac.za

Primary author: Ms DLAMINI, Phumla (optical fibre research unit (nelson mandela metropolitan university))

Co-authors: Mr ISOE, George (Centre for Broadband Communication,Nelson Mandela Metropolitan University); Dr GIBBON, Timothy (NMMU Physics Department)

Presenter: Ms DLAMINI, Phumla (optical fibre research unit (nelson mandela metropolitan university))

Session Classification: Applied Physics

Track Classification: Track F - Applied Physics