

Workshop No. 1

Multi-tone transmission techniques for optical networks

**September 21st, 2008, 9:00 - 13:00
Brussels/Belgium**

Workshop Objectives

In recent years the growing capacity of electronic signal processing has enabled the use of electronically generated orthogonal frequency division multiplexing (OFDM) to be contemplated for use in optical networks. At the same time the increasing impact of fibre impairments and the required inventory have led to suggestions for all optical multiplexing of regularly spaced coherent carriers. All of these approaches enable improved transmission performance by spreading the information signal across a large number of correlated carrier signals, with the transmission performance is dictated by the modulation rate of each individual sub-carrier.

This workshop will discuss:

- The basic properties of multi-tone transmission through a series of presentations covering both analogue and digital implementations.
- Application areas for multi-tone transmission, which range from short haul systems using multi-mode fibre to ultra long haul transmission without dispersion compensation.
- The potential of multi-tone systems to address the growing need for flexible 100 GbE solutions and beyond.
- Fundamental limits of multi-tone transmission, including a consideration of the impact of dispersion, non-linearity, optical signal to noise ratio, and the prospects for mitigation of these impairments.
- Implementation issues.

The workshop will address these key issues through a series of keynote invited presentations, and the organisers would welcome additional presentations covering any of the above topics from the viewpoint of operators, system and subsystem integrators, component manufacturers and academic laboratories. Our intention is that the workshop will provide a forum to explore the compatibility of each form of multi-tone modulation to the individual applications.

Organizers

- Dr Andrew Ellis; Tyndall National Institute, Ireland
- Dr Itsuro Morita; KDDI R&D Laboratories, Japan

Registration

Registration for the workshop is free, but mandatory to get access to the session rooms. Registration can only be done through the ECOC2008 registration webpage

Contact:

Dr Andrew Ellis, andrew.ellis@tyndall.ie

Program

09h00 Introduction

Session "Requirements"

09h10 "The impact of high speed access on future core network transmission"
Andrew Lord, BT [andrew.lord@bt.com]

Session "Introduction to multi-tone technologies"

09h20 "High capacity transmission using a combination of analogue and digital multi-tone processing"
Sander Jansen, KDDI [s.l.jansen@ieee.org]

09h40 "All optical implementation of multi-tone techniques – Coherent WDM"
Fatima Gunning, UCC [fatima.gunning@tyndall.ie]

10h00 Discussion

10h15 *Break 1*

Session "Applications and performance limits"

10h30 "Multi-tone techniques for multi-mode fibre"
Speaker TBA, COBRA

10h40 "No-Guard-Interval 100-Gb/s-class Optical OFDM Transmission Technique"
Akihide Sano, NTT [sano.akihide@lab.ntt.co.jp]

10h50 "European research in OFDM for SSMF applications"
Buchali, Fred, Alcatel-Lucent [Fred.Buchali@alcatel-lucent.de]

11h00 "Electronic Compensation of Fiber Nonlinearity using Adjacent Channel Information"
Etsushi Yamazaki, NTT [yamazaki.etsushi@lab.ntt.co.jp]

11h10 "Fiber nonlinearity and its compensation in direct-detection optical OFDM systems"
Arthur Lowery, Monash [Arthur.Lowery@eng.monash.edu.au]

11h20 "Coherent detection of spectrally overlapping multi-tone signals"
Guifang Li, CREOL [li@creol.ucf.edu]

11h30 Discussion

11.40 *Break 2*

12h00 Contributed presentations (if any)

Session "Implementation"

12.10 "Integrated All-Optical OFDM Modulator using a hybrid assembly technique with silica-based PLCs and LiNbO₃ phase modulators"
Akimasa Kaneko, NTT Photonics Labs [akaneko@aecl.ntt.co.jp]

12h20 "Channel capacity enhancement using multi-tone transmission and high speed electronic signal processing"
Maurice O'Sullivan, Nortel [osullms@nortel.com]

12h30 "AD and DA converters for multi-tone transmission systems"
Tobias Ellermeyer, Micram [tobias.ellermeyer@micram.com]

12h40 Discussion

12h50 *Concluding Remarks*