VPIphotonics
DESIGN AUTOMATION

Booth 245

40th ecoc
Cannes 2014

Attend live demonstrations, investigate new features and discuss your applications with us!

New Product!
VPImodeDesigner™

Analysis and optimization of straight anisotropic and bent isotropic optical waveguides and related devices; fully integrated with VPIcomponentMaker™ Photonic Circuits

New Product!
VPIlabExpert™

Advanced signal processing and performance analysis for the lab; sign up for live lab interfacing demos at our partners' exhibits

New Version!
DSP Library

Extensive library of lab-ready algorithms for coherent optical systems developed by Fraunhofer HHI; fully integrated as pluggable toolkit

HAPPY HOUR
23 September at 4 p.m.

Daily Feature Presentations

- ✓ Photonic and Hybrid Integrated Circuits
- ✓ Fiber Devices: Sources, Amplifiers, OSP
- ✓ 400Gb and 1Tb: 4D mod, SDM and more
- ✓ Digital Pre-distortion and Equalization
- ✓ Signal Processing and Analysis for Labs
- ✓ Aggregation, Optical Access and RoF
- ✓ Transients and Dynamic Networks
- ✓ Cost-optimized Equipment Configuration

Contributions to the Conference Program

Sun, 21 Sep. 2014, 14:00 - 17:30, WS3

The benefits of integrating numerical simulations and experiments

André Richter

Wed, 24 Sep. 2014, 15:45 - 18:00, P.3.12

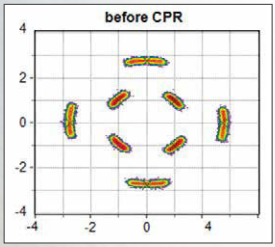
33% Capacity Improvement of a Direct Modulation Direct Detection OFDM Link using Adaptive Volterra Equalization

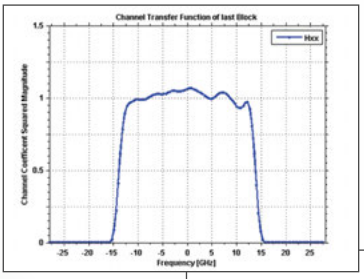
Nuno André, Hadrien Louchet, André Richter, Kai Habel (Fraunhofer HHI)

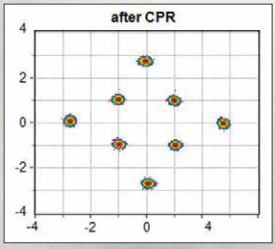
DSP Library

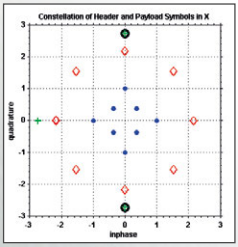
The new version of this pluggable toolkit provides lab-ready algorithms developed by Fraunhofer HHI to perform a diversity of DSP functions for coherent optical systems and a wide range of modulation formats. Among them I/Q imbalance correction, blind CD estimation and compensation, data-aided channel equalization, clock recovery and deskew, carrier frequency and phase recovery, polarization demultiplexing, and PMD compensation.

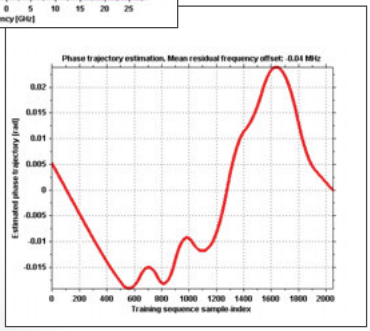
- ✓ Evaluate and benchmark DSP algorithms
- ✓ Ready-to-use for offline signal processing in lab experiments
- ✓ Address trade-off between DSP complexity and its performance
- ✓ Define component requirements and evaluate technology alternatives











VPIlabExpert™

This new product makes VPIphotonics' advanced signal processing and analysis functions available for the lab environment. This includes the generation, detection and performance analysis of DP-mQAM, 4D, OFDM, radio and other signal formats, application of sophisticated digital pre-distortion and equalization techniques, encoding and decoding with forward-error correction codes, emulation of component limitations and transmission impairments.

- ✓ Reduce efforts in the lab by applying ready-to-use advanced functionalities
- ✓ Virtualize lab equipment by emulating optical and electrical components
- ✓ Develop lab-ready signal processing solutions using simulations
- ✓ Unify methodologies and tools for simulation and lab environments

Live Demos with our Partners

Emulation of Optical Transmission Impairments

Simulation-enhanced lab experiments by emulating polarization scrambling, noise loading, CD and PMD accumulation; perform DSP stress tests and define component specifications via controlled repetition of test scenarios

at Keysight Technologies
Booth 368

PAM Transmission for 100Gb/400Gb Ethernet

Control a chain of bit-pattern generators and drive a digital-analog converter to perform electrical arbitrary waveform generator functions; perform signal equalization and analysis after sampling scope detection

at SHF Communication Technologies
Booth 248

OFDM for Optical Fiber Transmission

Generation, decoding and performance analysis of coherent 200Gb/s OFDM system; perform iterative adaption to transmission channel characteristics using bit and power loading equalization algorithm

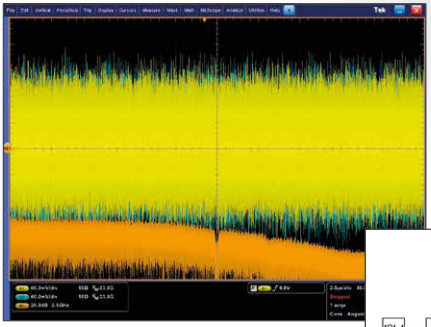
at Tektronix
Booth 495

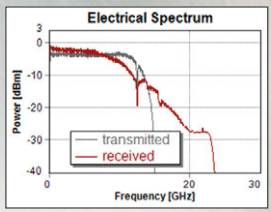
DSP Solutions for 400Gb and 1Tb Systems

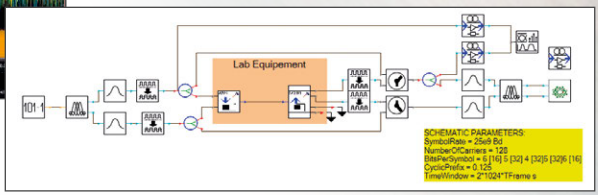
Demonstration of a flexible optical transceiver for single- and multi-carrier applications, consisting of an optical AWG and a 70GHz optical coherent frontend, with data-aided equalization performed using the DSP Library toolkit

at Fraunhofer Heinrich Hertz Institute
Booth 246

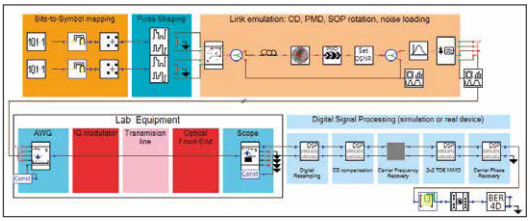
Optical OFDM

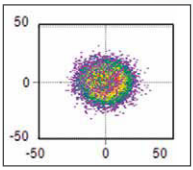


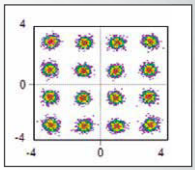


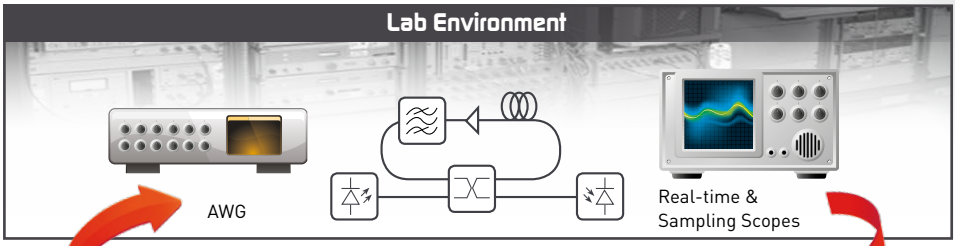


Emulation of Transmission Effects









VPIlabExpert™

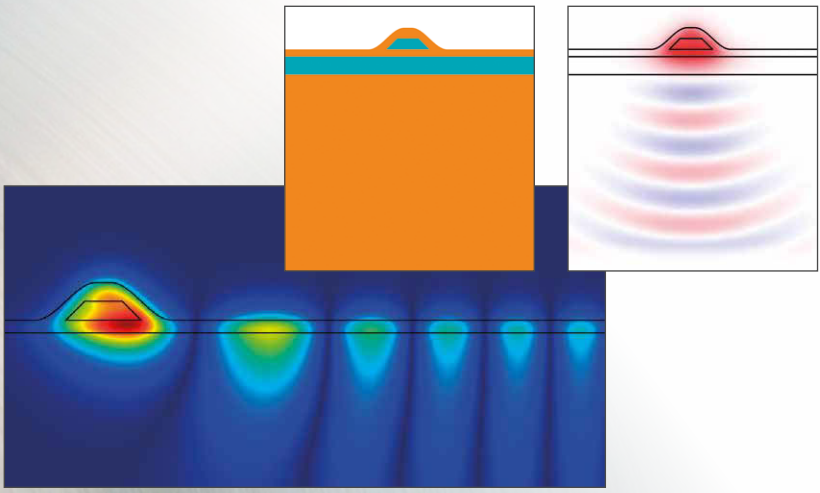
- ✓ Waveform generation (coding)
- ✓ Signal pre-distortion
- ✓ Emulation of component characteristics
- ✓ Emulation of transmission effects
- ✓ Automated signal synchronization
- ✓ Signal demodulation and DSP
- ✓ Performance analysis (BER, EVM,...)
- ✓ Iterative optimization

VPImodeDesigner™

This versatile simulation framework supports the analysis and optimization of integrated photonic waveguides and related devices. It implements full-vectorial and semi-vectorial finite-difference mode solvers with support of widely customizable non-uniform meshing and perfectly matched layer absorbing boundaries. Full integration with VPIcomponentMaker™ Photonic Circuits allows translating waveguide cross-section definitions into model parameters of passive and active devices.

- ✓ Facilitate advanced layout definitions and optimization tasks via powerful Python interface
- ✓ Model straight waveguides made of dispersive anisotropic materials
- ✓ Model bent waveguides made of dispersive isotropic/lossy materials
- ✓ Verify cross-sections and analyze results using advanced visualization capabilities

Leakage in Optical Waveguide



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