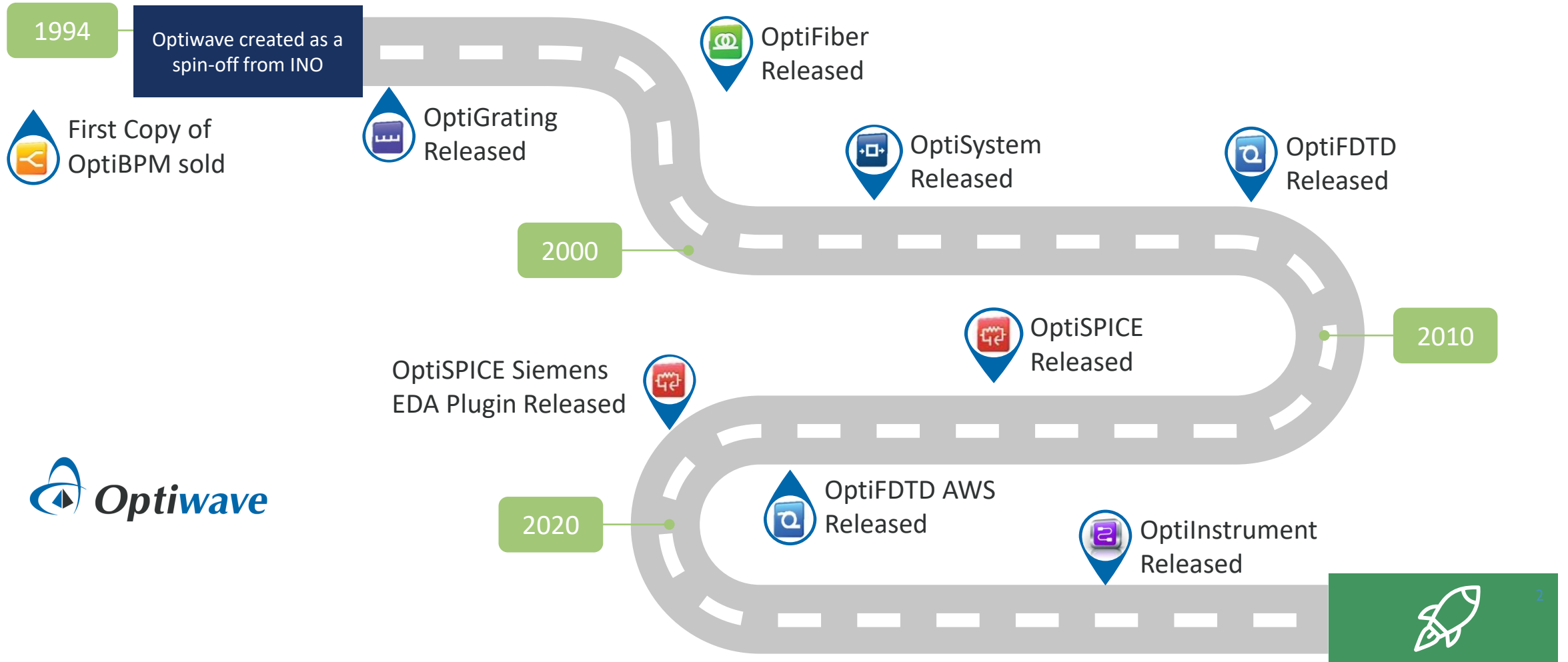




# Photonics Automation Design Tools

OPTIWAVE SYSTEMS INC.

# OPTIWAVE TIMELINE



# PHOTONICS AUTOMATION DESIGN TOOLS



OptiSystem – Optical Systems



OptiSPICE – Optoelectronic Circuits



OptiFDTD – Passive Component Design with FDTD Method



OptiBPM – Waveguide Design



OptiGrating – Waveguide and Fiber Gratings



OptiFiber – Fiber Mode Analysis



OptiMode – Waveguide Modal Analysis

**SYSTEM LEVEL**

**COMPONENT LEVEL**

# COMPANY OVERVIEW

29

Years in Business

7,000+

Paid Accounts

3,000,000+

Evaluation Downloads

80+

Countries

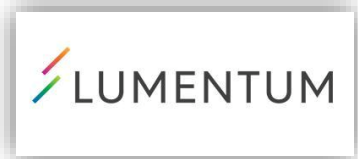
15,000+

Paid Users

12,000+

Citations

# OUR KEY CUSTOMERS





# OptiSystem & OptiInstrument Software

**Ahmad Atieh, Ph.D.**  
**VP – Optical Systems**

# GENERAL INFORMATION

- Optiwave develops innovative software tools for **designing**, simulating, and **optimizing** components, links, systems and networks
- Optiwave's software **offers** users a distinct competitive advantage through
  - shortening **product time introduction to the market**
  - improving **product quality**
  - enhancing **productivity and cost-effectiveness**



# PRODUCT LINE

Optiwave's software has been licensed to more than 1000 industry-leading corporations, universities, research and governmental institutions in over than 80 countries worldwide.

## System-Level



**OptiSystem**

Optical Communication System and Amplifier Design Suite



**OptiSPICE**

The First Opto-Electronic Circuit Design Software

## Component-Level



**OptiBPM**

Waveguide Optics Design Software



**OptiFDTD**

Finite-Difference Time-Domain Simulation Design



**OptiMode**

Waveguide Modal Analysis Software



**OptiFiber**

Optical Fiber Design Software



**OptiGrating**

Integrated and Fiber Optical Gratings Design Software

## Instrumentation-Level



**OptiInstrument**

Instruments Communication and Control Tool



# OPTIWAVE SOFTWARE DOWNLOAD



Registering for this site is easy. Just fill in the fields below, and we'll get a new account set up for you in no time.

Grants access to 30-day evaluation licenses and Optiwave's Community Forums.

**Users must create a new account using the form below to access 30-day evaluations.**

**IMPORTANT: You must register with a valid email to activate your account. Otherwise, you will not receive**



## Account Details

**Username (required)**

**Email Address (required)**

**Choose a Password (required)**

**Confirm Password (required)**

## Profile Details

**Full Name (required)**

**Organization (required)**

**Job Title (required)**

**Country (required)**

[30-Day Evaluations](#)

[OptiPerformer](#)

[OptiSystem Labs](#)

[OptiSystem Optical  
Communication Labs](#)

[Free OptiFDTD 32-bit](#)

[WDM Phasar Freeware](#)

[All Other Downloads](#)

# OptiSystem Components – I

**Light Sources** (CW, LED, VCSEL, DFB, FP, White Light Source, solar source)

**Optical Modulators** (MZM: Single/Dual Drive and Single/Dual Port  
MZM, EAM, PM, AM, FM)

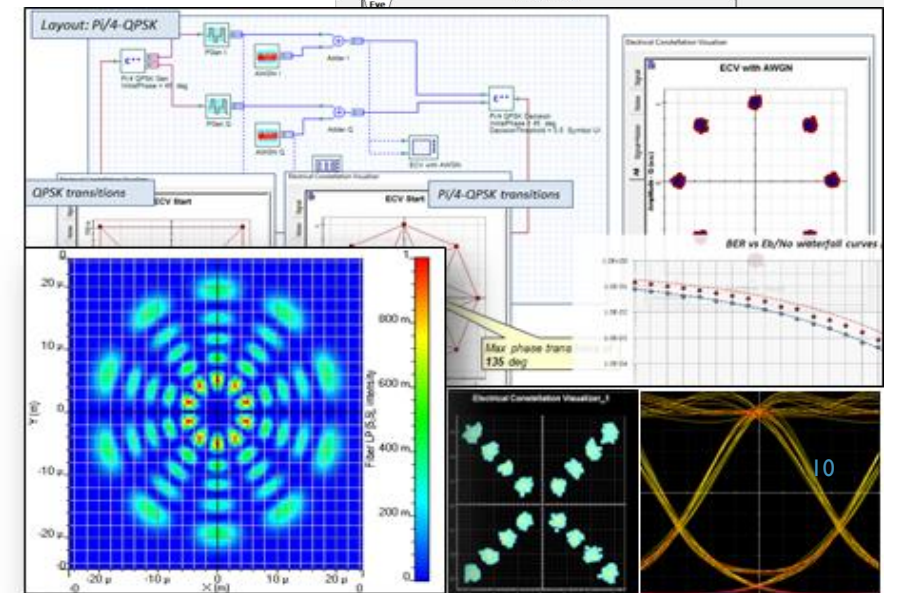
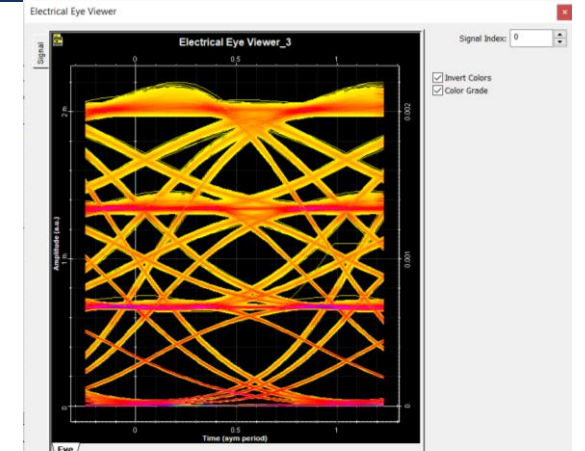
**Bit Sequences** (PRBS, User Defined, Compliance Test Patterns)

**Optical Fiber** (SMF, MMF, MCF, PCF)

**Electrical Modulators** (OFDM, Quadrature Modulator)

**Modulation Formats** (RZ, NRZ, CSRZ, DB, DPSK, mPSK,  
mQAM, PAM<sub>x</sub>, PPM, PAS)

**Opto-Electronic Circuits** (Ring Resonators, Laser Drivers,  
Switches, Optical Interconnects)



# OptiSystem Components – II

**Signal Processing** (DSP, MLSE Equalizer, **Electronic Equalizer** [FFE, DFE, AE], Viterbi Phase Recovery, **Data Recovery**, Clock Recovery, **3R Regenerator**)

**FEC and Bit Mapping** (Reed-Solomon, **LDPC**, 4B/5B, **8B/10B**, 4B/3T)

**Detectors** (pin, **APD**) **Over 580 Components**

**Optical Amplifiers** (ER/Yb/Tm/Pr/Ho, **SOA**, Raman, **GFF Optimization**, WG ER/Yb)

**Electrical Amplifiers** (Transimpedance, **Limiting**, AGC)

**Passive Modules** (Couplers, **MUX/DEMUX**, AWG, **Switches**, Attenuator, Circulator, etc..)

**Multimode Applications** (Fiber, **amplifier**, Mode Generator, **Passives**, Spatial Visualizers)

**Optical Channel** (Fiber, **LiFi**, Satellite, **FSO**, VLC, **underwater FSO**)

**Visualizers** (Optical, **Electrical**, Binary, **M-ary**, BERT, **Lightwave Analyzer**)

11

**Unidirectional & Bidirectional and Single & Dual Polarization**

# OptiSystem Software Applications & Example Library

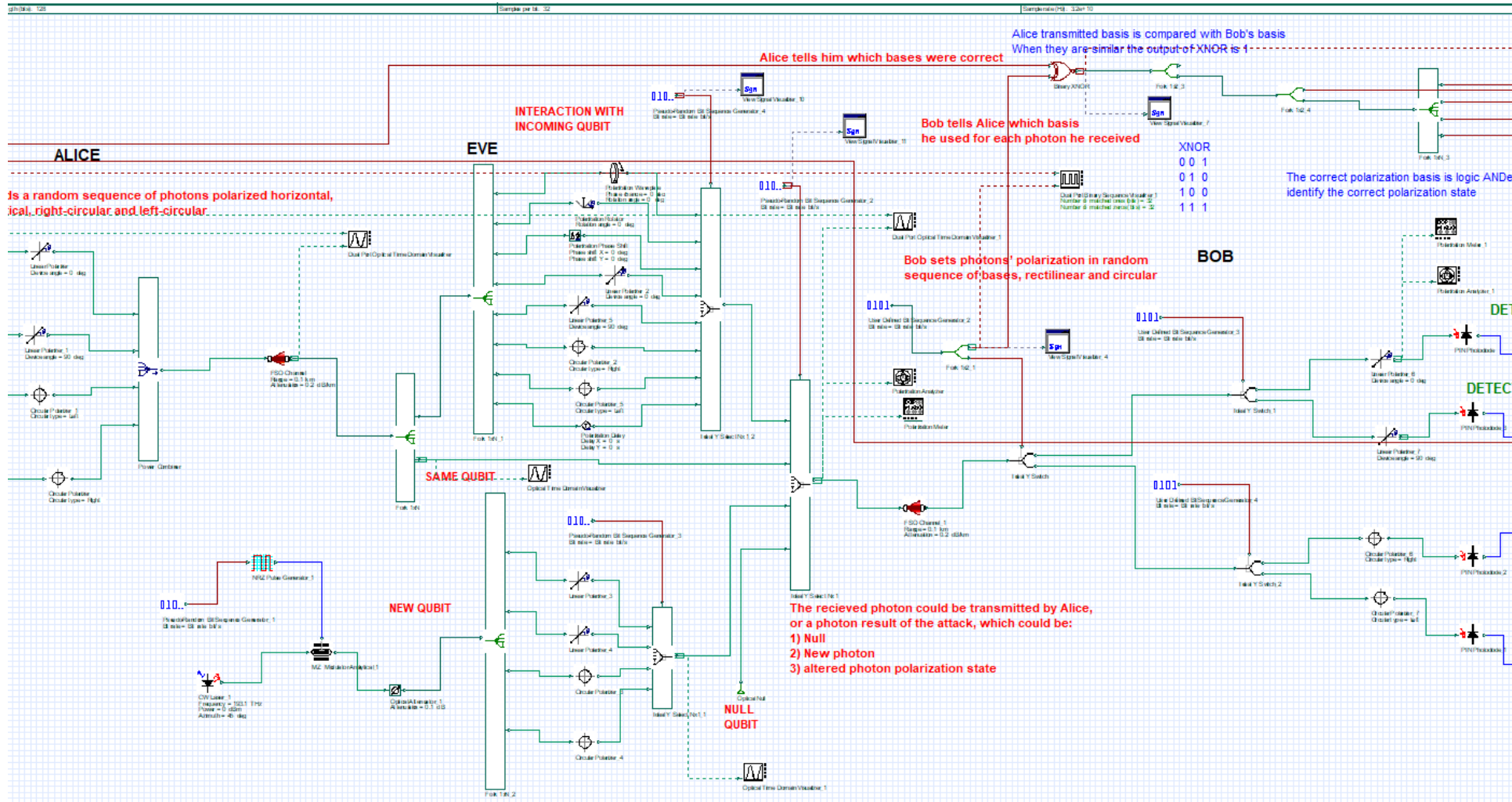
- Advanced Modulation (mQAM, PAM<sub>x</sub>, mPSK, PAS)
- **New Radio front-haul**
- Optical Amplifiers – Optimization
- **Microwave Photonics**
- Sensors
  - OTDR & Phi-OTDR
  - FBG
  - PCF for Biosensing
- **Optical Wireless Communication**
  - **LiFi**      **·VLC**
  - **Satellite**      **·FSO and under water FSO**
- Spatial Division Multiplexing
  - Few Modes MMF
  - SM and MM MCF

Name	Date modified
Advanced modulation systems	2021-04-29 7:45 AM
All optical processing	2021-04-29 7:45 AM
Component sample files	2021-04-29 7:45 AM
Dispersion compensation	2021-04-29 7:45 AM
Fiber analysis and design	2021-04-29 7:45 AM
Introductory tutorials	2021-04-29 7:45 AM
Lightwave systems	2021-04-29 7:45 AM
Link equalization and FIR filters	2021-04-29 7:45 AM
Metro and access systems	2021-04-29 7:45 AM
Microwave and RoF optical systems	2021-04-29 7:45 AM
Miscellaneous	2021-04-29 7:45 AM
Multimode systems	2021-04-29 7:45 AM
Optical amplifiers	2021-04-29 7:45 AM
Optical receiver design and analysis	2021-04-29 7:45 AM
Optical transmitter design and analysis	2021-04-29 7:45 AM
Optical wireless	2021-04-29 7:45 AM
OptiSystem GPU performance	2021-04-29 7:45 AM
PythonScripts	2021-04-29 7:45 AM
ResultsData	2021-04-29 7:45 AM
Script samples	2021-04-29 7:45 AM
Sensor systems	2021-04-29 7:45 AM
Software interworking	2021-04-29 7:45 AM
Solitons	2021-04-29 7:45 AM
WDM systems	2021-04-29 7:45 AM

Over 930 .osd files in 241 folders

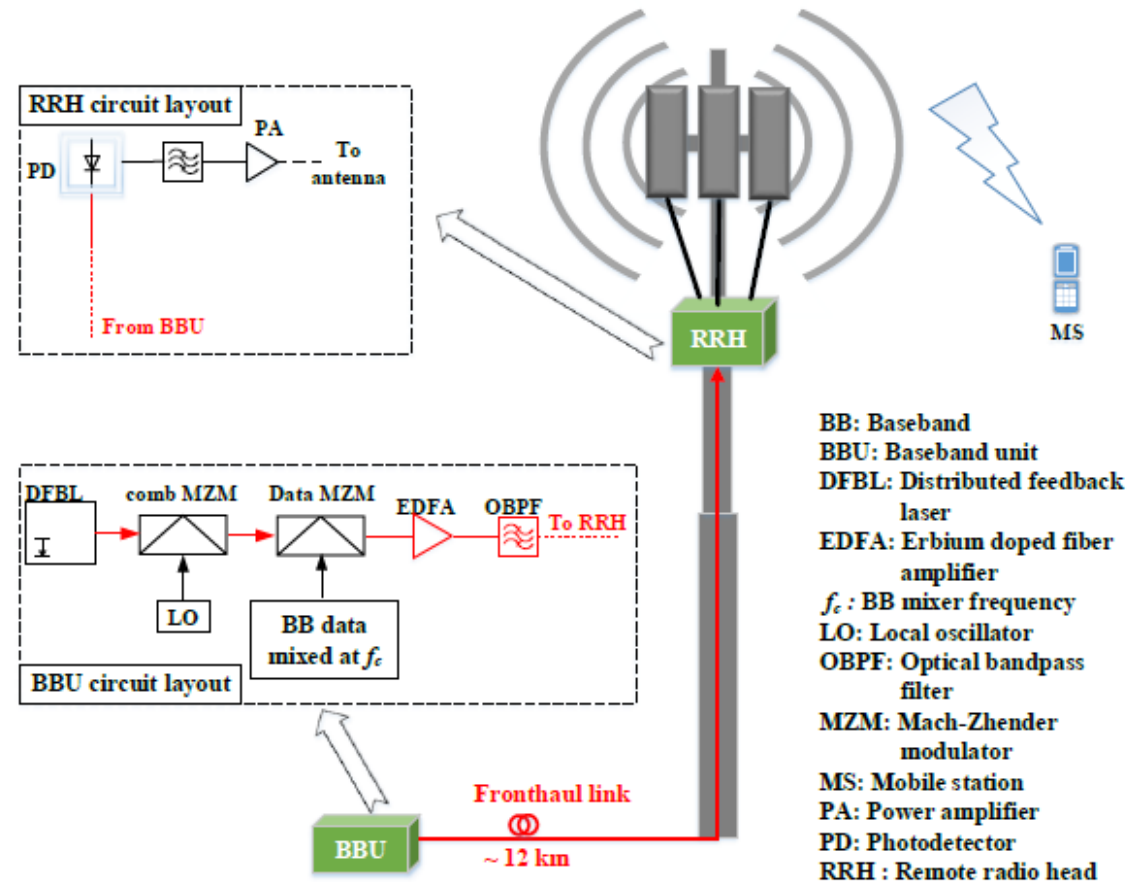


# EVE ATTACK SETUP





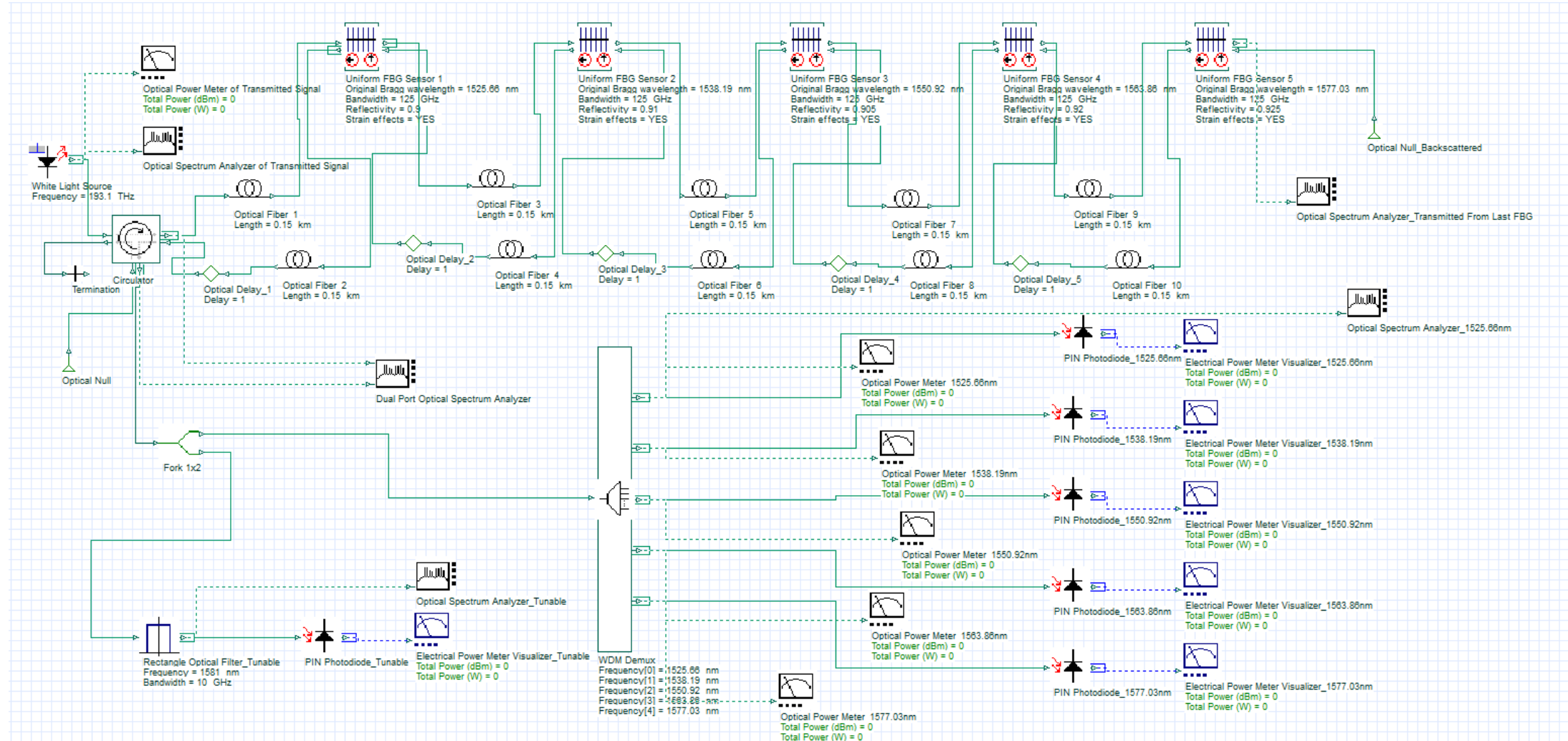
# 5G Fronthaul Downlink Transmitter\*



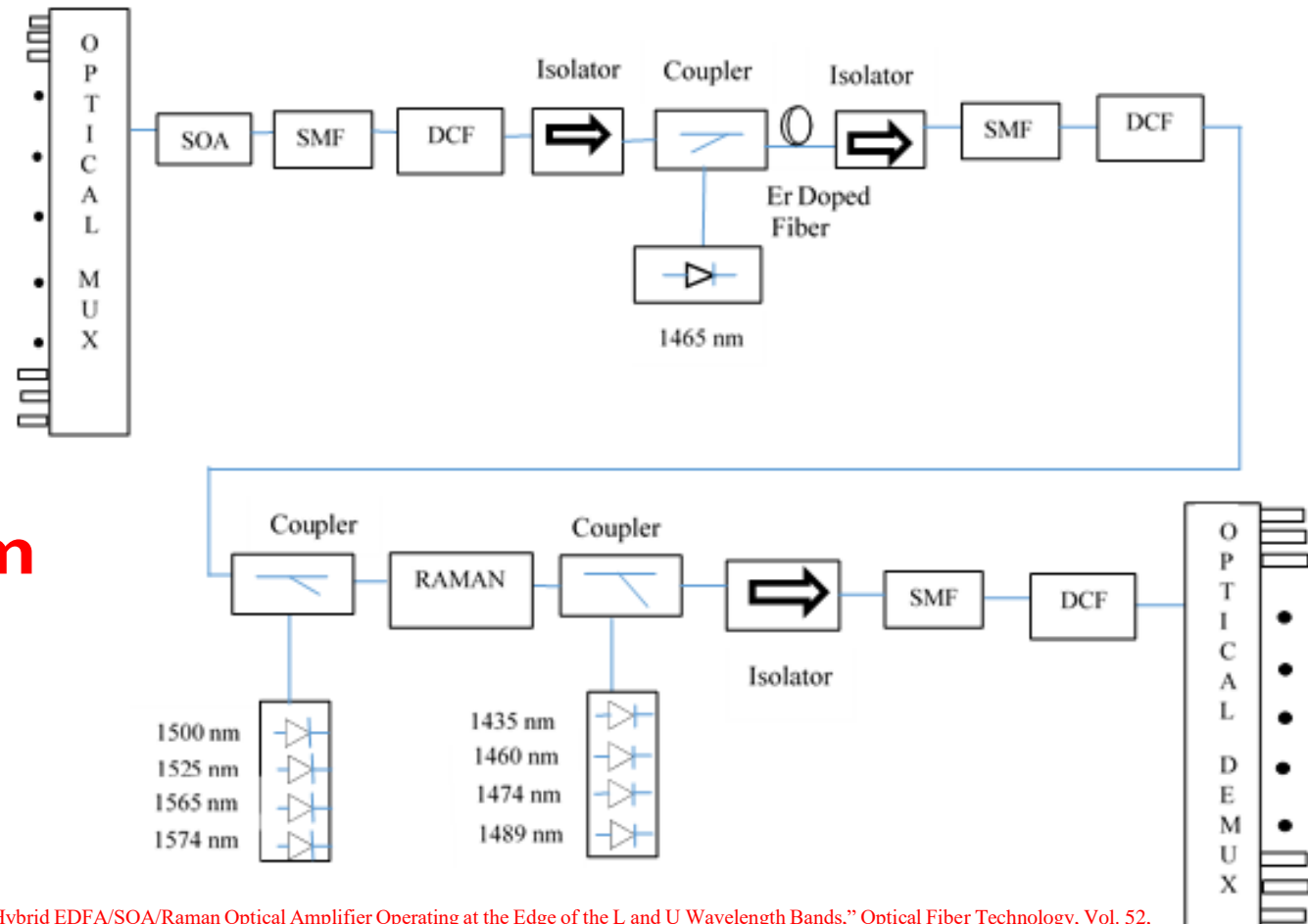
[\*] Noweir, M., Zhou, Q., Kwan, A., Valivarathi, R., Helaoui, M., Tittel, W & Ghannouchi, F. M, "Digitally linearized radio-over fiber transmitter architecture for cloud radio access network's downlink," *IEEE Transactions on Microwave Theory and Techniques*, 66(7), 3564-3574, (2018).



# Railway Sensing Project



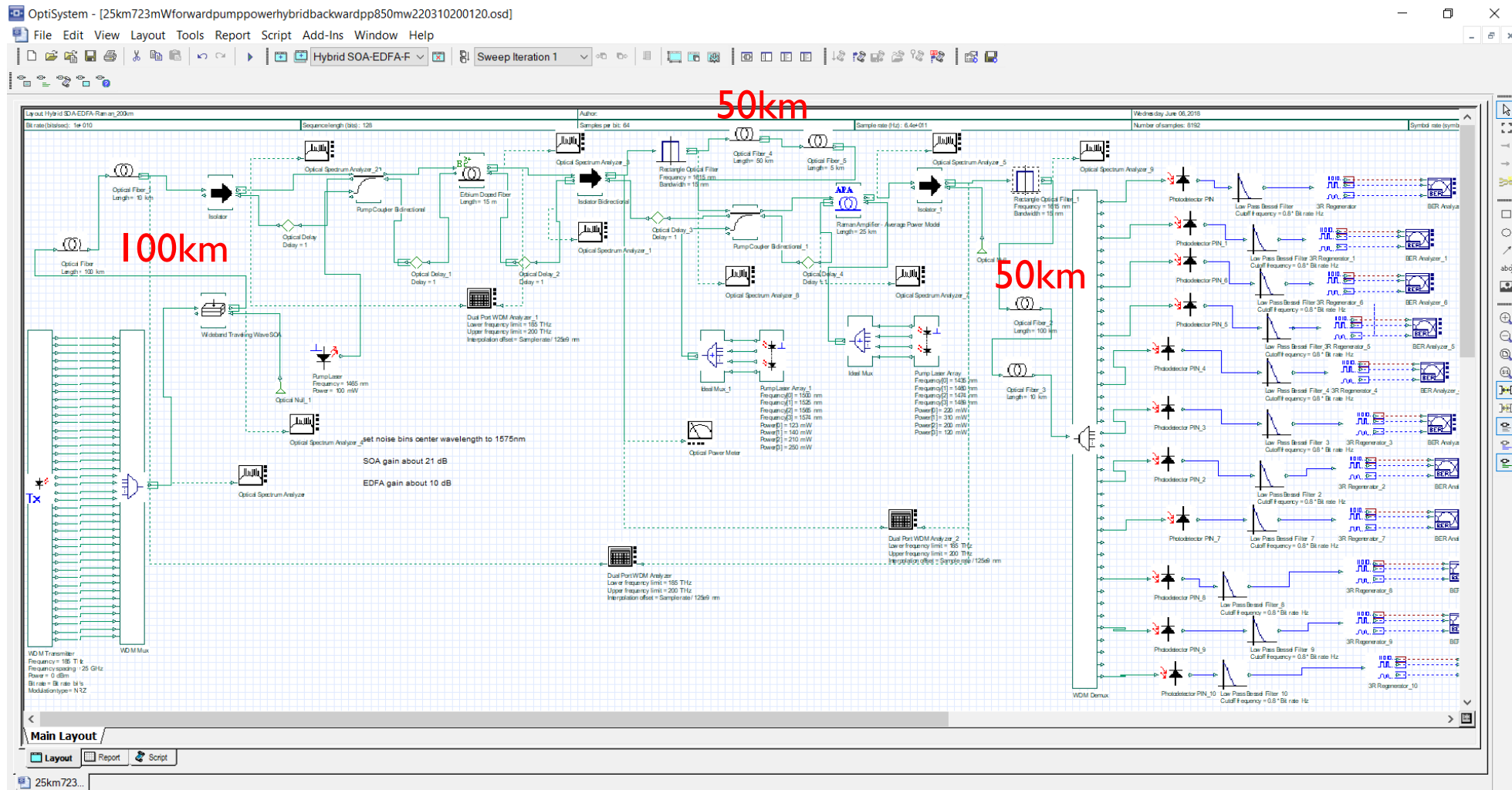
# HYBRID SOA/EDFA/RAMAN OPTICAL AMPLIFIER\*



**Optical DWDM System  
at Edge of L&U Bands**

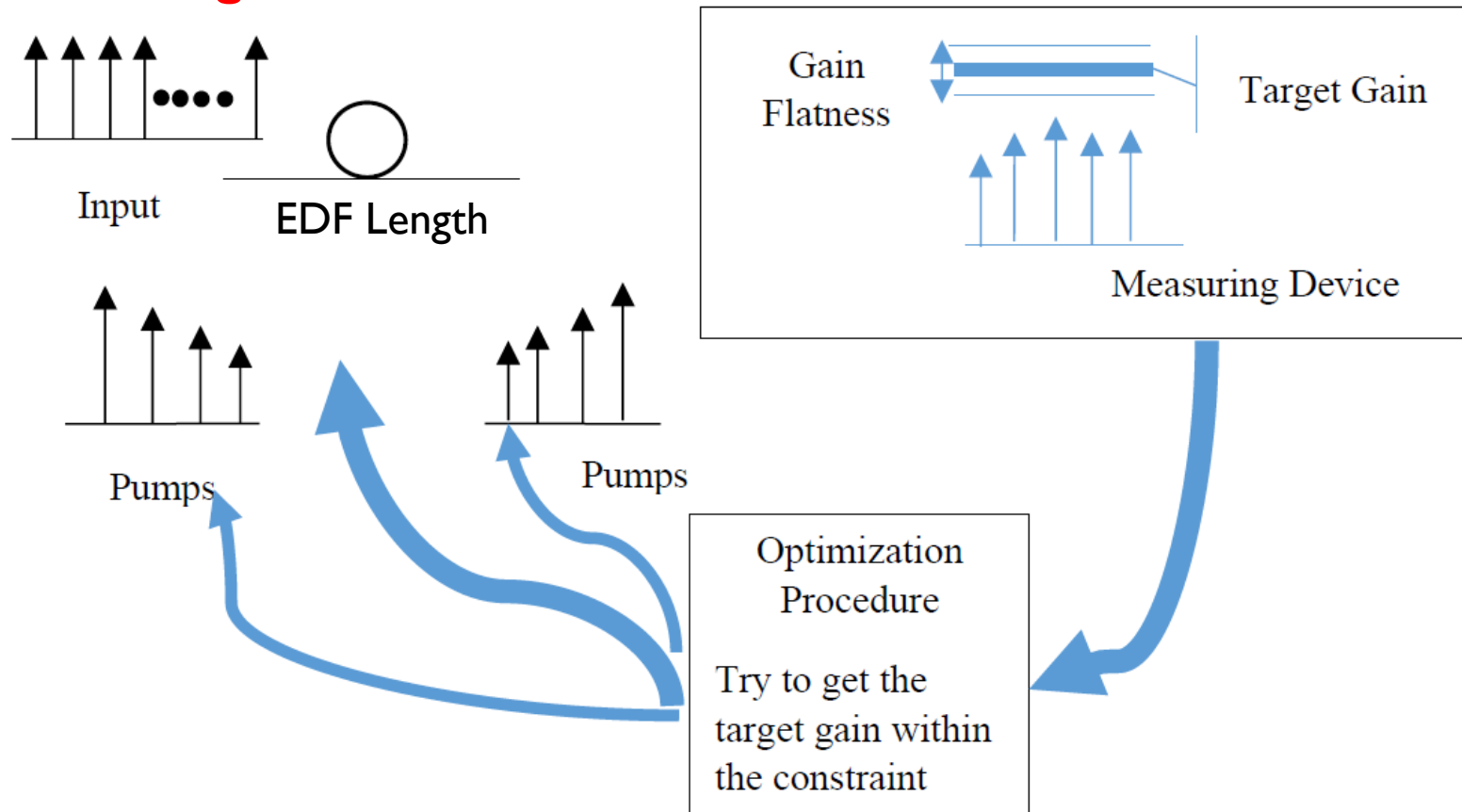
[\*] Ajaybeer Kaur, Manjit Singh Bhamrah, Ahmad Atieh, "Very High Flat-Gain Hybrid EDFA/SOA/Raman Optical Amplifier Operating at the Edge of the L and U Wavelength Bands," Optical Fiber Technology, Vol. 52, 101971, Jun 2019.

# HOA DWDM TRANSMISSION SYSTEM



# AMPLIFIER PARAMETERS OPTIMIZATION

## DWDM Signal



# OPTIMIZATION PROCESS

The screenshot displays the OptiSystem software interface for an EDFA (Erbium-Doped Fiber Amplifier) optimization project. The main window shows the optimization settings and a convergence graph.

**Optimization Settings:**

- Calculate the whole project (selected)
- Calculate all sweep iterations in active layout
- Calculate current sweep iteration
- Calculate multi thread all sweep iterations in active layout
- Disable Monitors

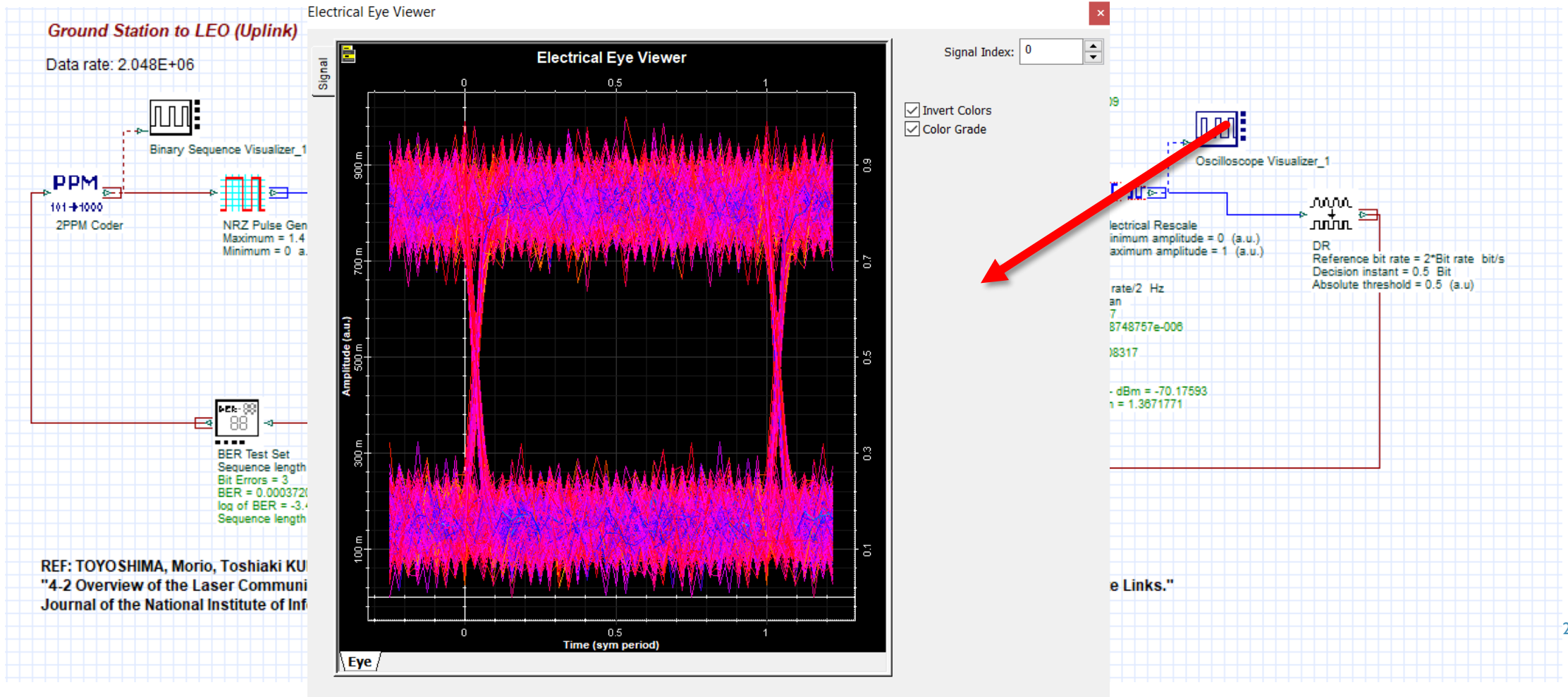
**Convergence Graph:**

The graph shows the convergence of the EDFA Gain (dB) over iterations. The x-axis represents the iteration number (0 to 500), and the y-axis represents the Gain (dB) (0 to 20). The gain starts at approximately 10 dB and converges to a value of about 18 dB after approximately 400 iterations.

**Main Layout Diagram:**

The main layout diagram shows the optical path, including components like the EDFA, WDM Demux, Gain Flattening Filter, and various Optical Spectrum Analyzers. The EDFA is configured with a length of 1.107297988e+7300 m. The Gain Flattening Filter is configured with a length of 1.88211454025167 m. The Pump 1 is configured with a frequency of 974 nm and a power of 400.18827529431171 mW.

# Satellite Communication





# OPTIINSTRUMENT SOFTWARE IN ACTION

Communicate and Control  
equipment **from Different Vendors**

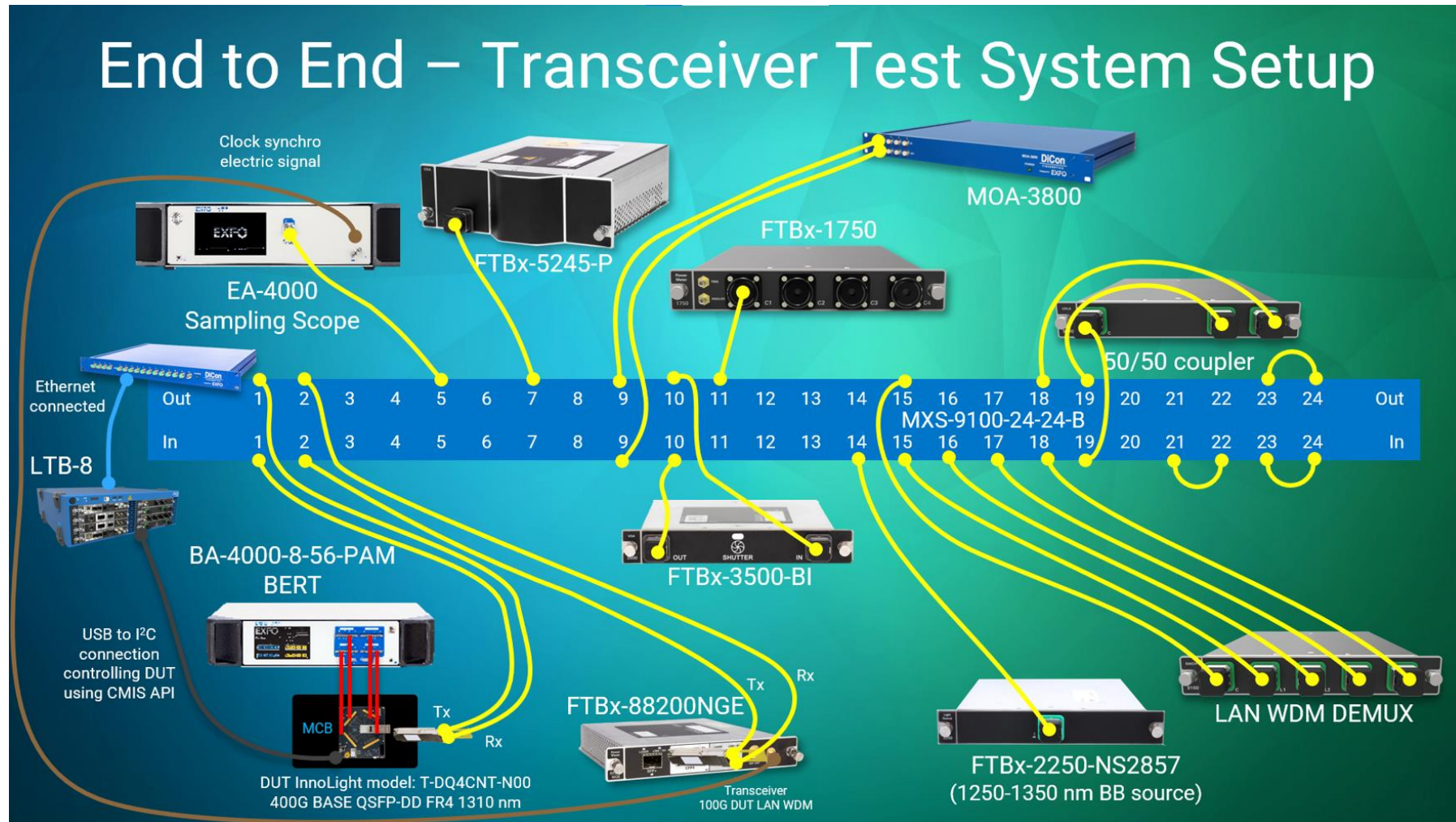




# OPTIINSTRUMENT FEATURES & APPLICATIONS

- **Remote/Co-location** communication and control of instruments
- **Set-up** parameters of equipment
- **Automate** testing and characterization of devices using Instruments from same or different vendors
- **Capture data, process, save and display** single or multi-signals
- Saved data can be in JSON, .txt or CSV format
- User Raw Data Acquisition and Processing Python file
- **SCPI Command Execution (py visa/NI visa) in Single Command Window**
- Custom Python file(s) loading to build command sequence

# LTB-8 REMOTE SETUP QUEBEC CITY/CANADA



# EXFO CTTP-10 EQUIPMENT GUI

The screenshot displays the EXFO CTTP-10 equipment GUI. The top status bar shows the following parameters: Start: 1520.0000 nm, Stop: 1600.0000 nm, Span: 80.0000 nm, Center: 1560.00000 nm, Power: 3/-/- dBm, Sampling: 1 pm, Speed: 100/-/- nm/s, Averaging time: 0.01/-/- ms, Mode: Single, Start: Manual, Progress: 100 %, Scan: 1 (4/4). The interface includes a toolbar with buttons for Open, Save, Store, Clear, and Remove. On the right, there are controls for Power units (dB selected, Ratio unselected) and Spectral units (nm selected, THz unselected). The main workspace shows a subsystem setup with a DUT (Device Under Test) block. The DUT has an Input 1 and an Output 1. Four TLS (Tunable Laser Source) modules are connected to the DUT: TLS1 (Laser 1, EXFO T100S-HP) is connected to Input 1; TLS2, TLS3, and TLS4 are connected to the DUT's internal routing. A 10-channel device is shown with channels 1 through 10. Channel 4 is labeled 'SCAN SYNC' and Channel 5 is labeled 'L.PDL OPNG'. The device has two sets of TRIG IN ports (IN 1-4 and IN 5-8) and two sets of TRIG OUT ports (OUT to SCAN SYNC and OUT to DUT). A physical image of the EXFO CTTP-10 equipment is shown on the right. The bottom status bar shows the Analysis tab and buttons for Open and Save.

# OPTIINSTRUMENT 4.0 GUI

The screenshot displays the Optiwave - OptiInstrument GUI. The interface is divided into several panels:

- List Of Command Sequence:** A list of commands and their corresponding devices. The list includes commands like `*CLS`, `:LINS2:STAT?`, `:LINS2:SOUR1:POW:WAV?`, `:LINS2:SOUR1:POW:STAT ON`, `:LINS2:SOUR1:POW:STAT?`, `:LINS4:STAT?`, `:LINS4:ROUT1:OPEN`, `:LINS4:ROUT1:OPEN:STAT?`, `:LINS4:ROUT1:SCAN 1`, `:LINS4:ROUT1:SCAN?`, `:LINS3:STAT?`, `:LINS3:INP:WAV 131...`, `:LINS3:INP:WAV?`, `:LINS3:CONT:MODE ...`, `:LINS3:INP:ATT 5 DB`, `:LINS3:INP:ATT?`, `:LINS3:OUTP:LOCK...`, `:LINS3:OUTP:STAT ...`, `:LINS0:STAT?`, `:LINS0:SENS1:STAR...`, `:LINS0:SENS1:STAR?`, `:LINS0:SENS1:STOP...`, `:LINS0:SENS1:STOP?`, `:LINS0:CALC1:DFB:S...`, and `:LINS0:CALC1:DFB:C...`.
- Current Active Instrument:** `TCPIP0::172.22.2.1::inst0::INSTR`
- Available Instruments:** `TCPIP0::172.22.2.1::inst0::INSTR`
- SCPI Command Execution Method:** `Py visa`
- Command Execution:** A text input field containing `*IDN?` and buttons for `Write`, `Query`, and `Write/Read`. The `Write` button is selected.
- VI\_SUCCESS:** A text area showing the response `VI_SUCCESS`.
- Parameter Table:**

Parameter	Value
Short Description	Identification Query.
Long Description	This command uniquely identifies the device.
- Display:** A spectral plot showing Intensity (dBm) on the y-axis (ranging from -70 to -30) versus Wavelength (nm) on the x-axis (ranging from 1300 to 1500). The plot shows a broad spectrum with a sharp peak at approximately 1310 nm.
- Command Sequence:** A table listing the commands and their types:

Commands	Device	Type
0 Exfo_Switch_wAllSources		
1 *CLS	Exfo LTB8	WriteRead
2 :LINS2:STAT?	Exfo LTB8	Query
3 :LINS2:SOUR1:POW:WAV?	Exfo LTB8	Query
4 :LINS2:SOUR1:POW:STAT ON	Exfo LTB8	WriteRead
5 :LINS2:SOUR1:POW:STAT?	Exfo LTB8	Query
6 :LINS4:STAT?	Exfo LTB8	Query
7 :LINS4:ROUT1:OPEN	Exfo LTB8	WriteRead
8 :LINS4:ROUT1:OPEN:STAT?	Exfo LTB8	Query
9 :LINS4:ROUT1:SCAN 1	Exfo LTB8	WriteRead
10 :LINS4:ROUT1:SCAN?	Exfo LTB8	Query
11 :LINS3:STAT?	Exfo LTB8	Query

# OPTISYSTEM CALLS OPTIINSTRUMENT

The screenshot displays the OptiSystem interface with a simulation layout and two overlaid windows.

**Equipment Comm and Control Properties Dialog:**

Label: Equipment Comm and Control

Buttons: OK, Cancel, Evaluate Script, Add Param..., Remove Par..., Edit Param..., Load..., Save As..., Help

Disp	Name	Value	Units	Mode
	Number of connection(s)	2		Normal
	TCP/IP/SOCKET connection (1)	172.2.22.1		Normal
	TCP/IP/SOCKET connection (2)	172.2.22.2		Normal

**Optical Time Domain Visualizer Plot:**

Signal Index: 0

Auto Set

Time Units: s

Automatic range

Center: 0.31984375e-001 s

Start: -31.984375e-009 s

Stop: 0.671671875e-01 s

Amplitude Units: W

Automatic range

Max: 0.001048951048 W

Min: -49.9500499500 W

Analysis:  Phase  Chirp

The plot shows a periodic signal with a period of approximately 100 ns. The y-axis is labeled 'Power (W)' and ranges from 0 to 1 m. The x-axis is labeled 'Time (s)' and ranges from 0 to 600 ns.

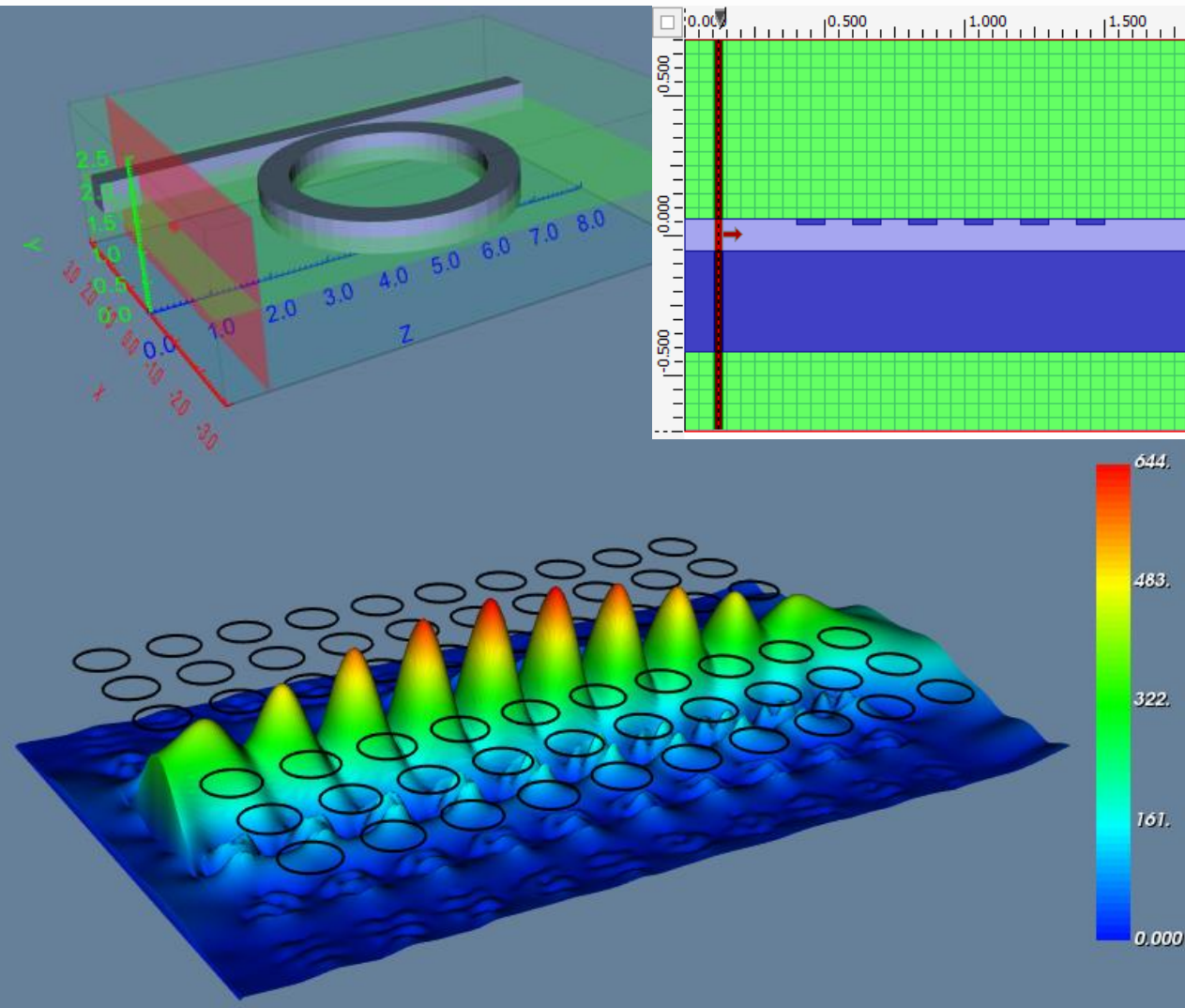




# **OptiFDTD – Finite-Difference Time-Domain Package**



# OPTIFDTD

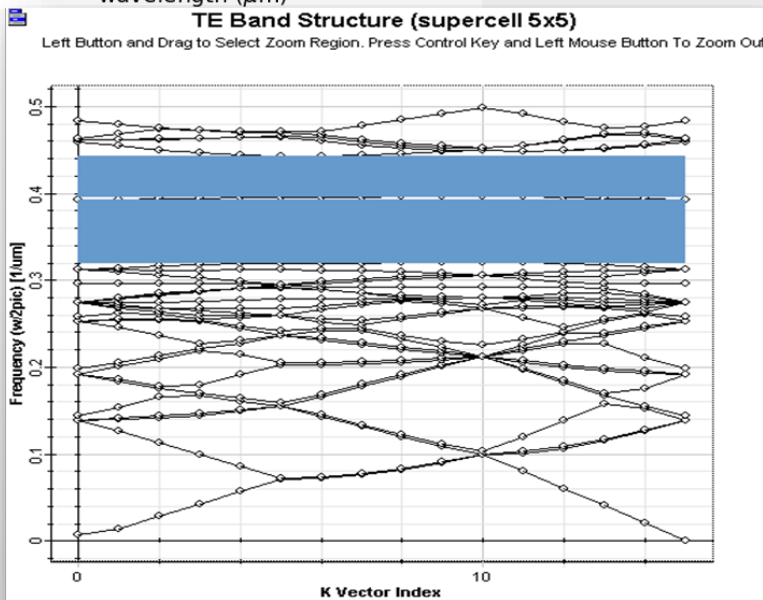
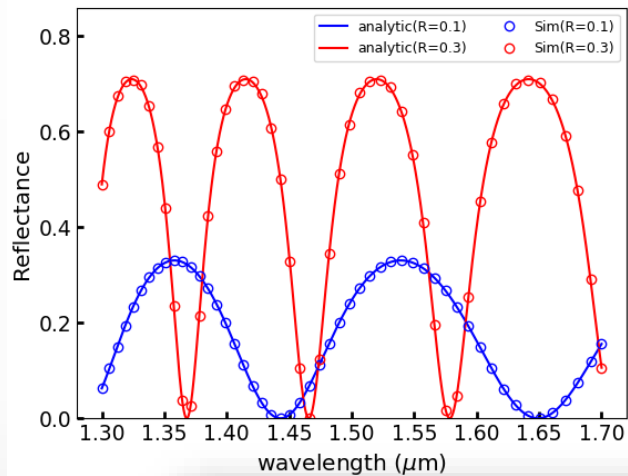


- Finite-Difference Time-Domain: discretization of Maxwell's equations and the simulation domain in both time and space
- Robust simulation engine providing full vector field information
- Minimal assumptions in theoretical development
- Natively supports bi-directional propagation, resonators and meta-surfaces and photonic crystals





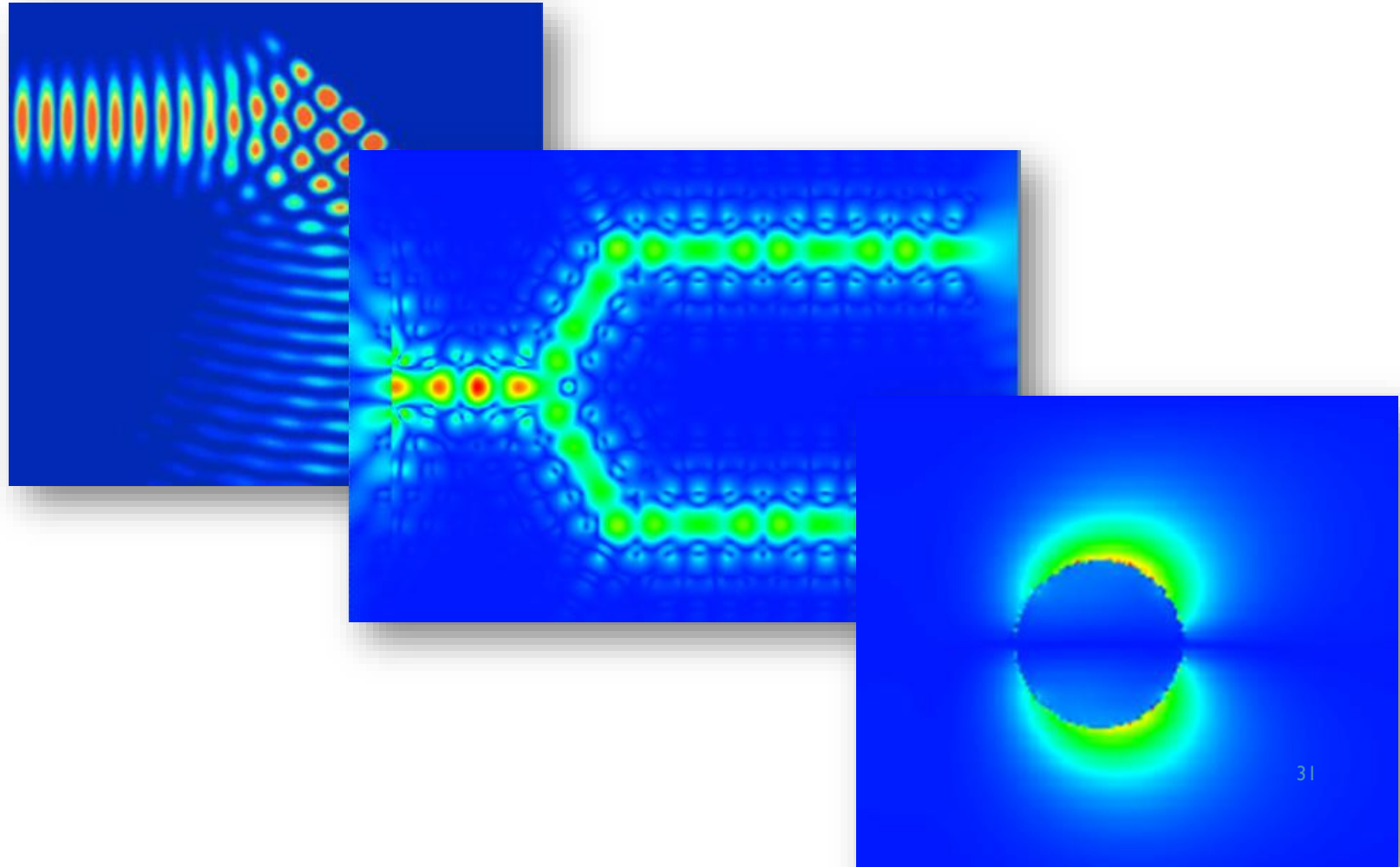
# OPTIFDTD



- Sources (Rectangular, Gaussian, Point, Advanced mode injection, User-defined field injection)
- Pulse source in time provides spectral analysis with a single simulation
- Materials (Constant dielectric, dispersive, 2D non-linear)
- Components (3D structures, waveguides, CAD import, Mask import)
- Observers (Point, Line, Area)
- S-Parameter support for integration with other modelling software (OptiSpice)
- Planewave expansion analysis for photonic crystals
- Parameterization of design
- VBScripting for powerful support for dynamic design and analysis

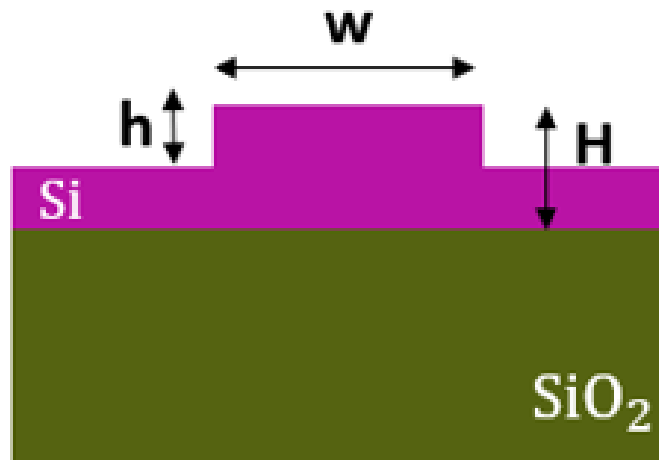
# OPTIFDTD – SELECT APPLICATIONS

- Dielectric and metallic gratings
- CMOS sensors design
- Photonic crystals
- Integrated optics
- Optical filters and resonators
- Solar cells
- LED and OLED passive design
- Plasmonics
- Surface Plasmon Resonance
- Nanoparticles simulations
- Diffractive micro-optics elements

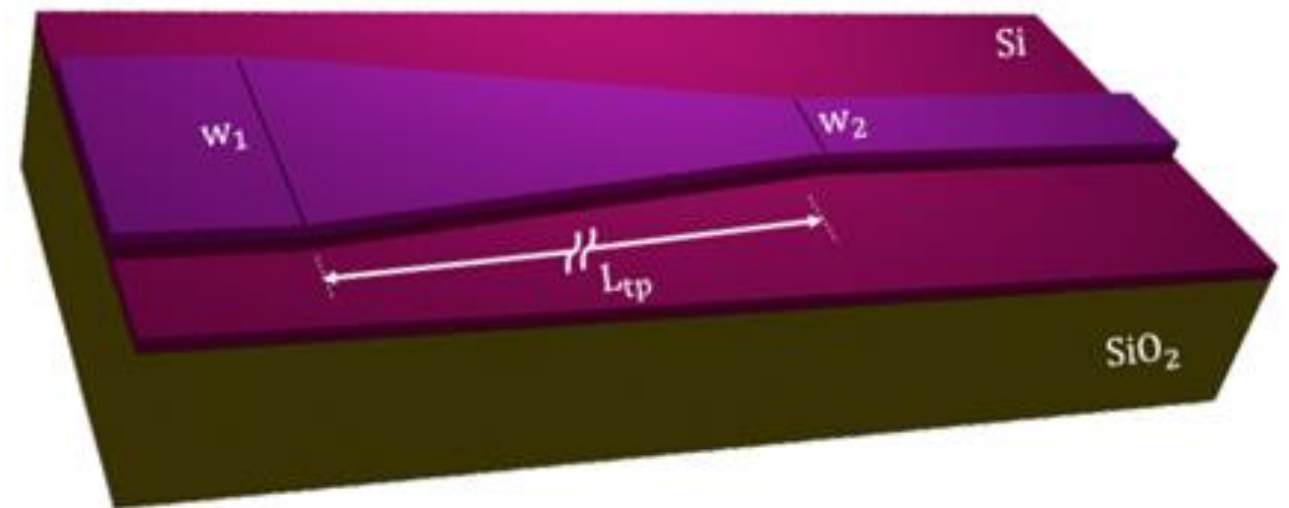


# POLARIZATION CONVERTER

SOI Ridge Waveguide



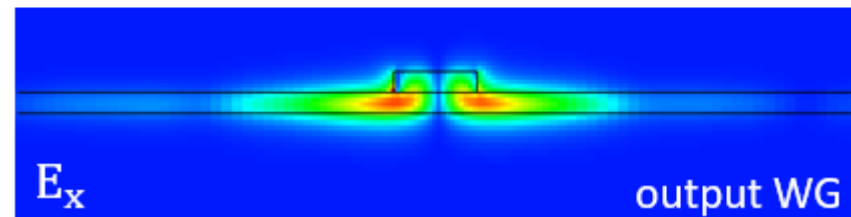
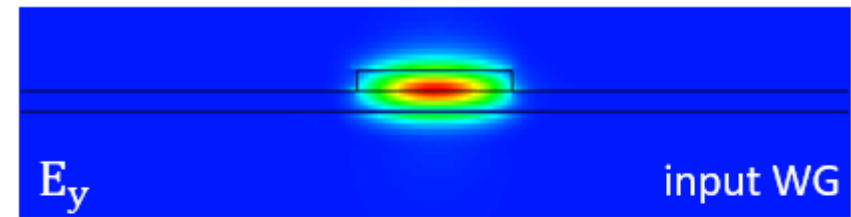
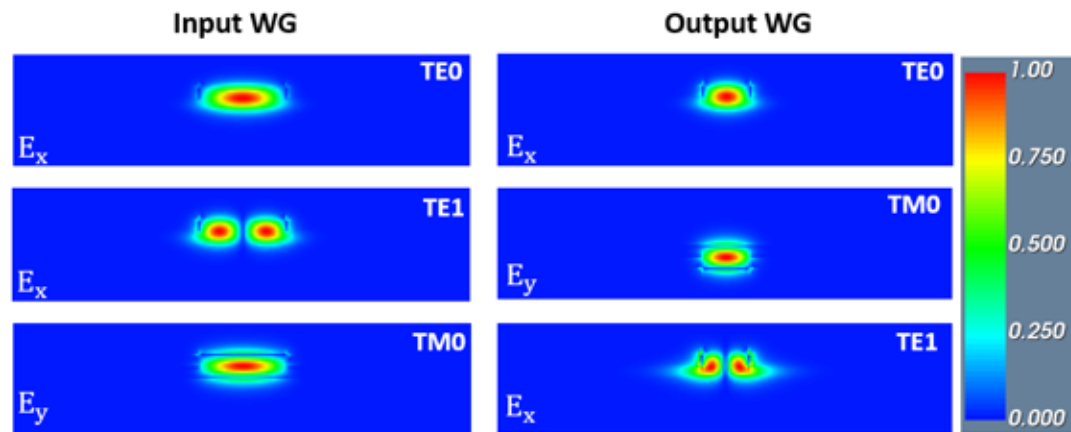
Waveguides



D. Dai, Y. Tang, and J. E. Bowers. "Mode conversion in tapered submicron silicon ridge optical waveguides," *Optics express*, Vol. 20, No. 12, pp. 13425-13439, 2012.

D. Vermeulen, K. V. Acoleyen, S. Ghosh, W. D. Cort, N. A. Yebo, E. Hallynck, K. D. Vos et al. "Efficient tapering to the fundamental quasi-TM mode in asymmetrical waveguides," In 15th European conference on Integrated Optics (ECIO), 2010.

# POLARIZATION CONVERTER

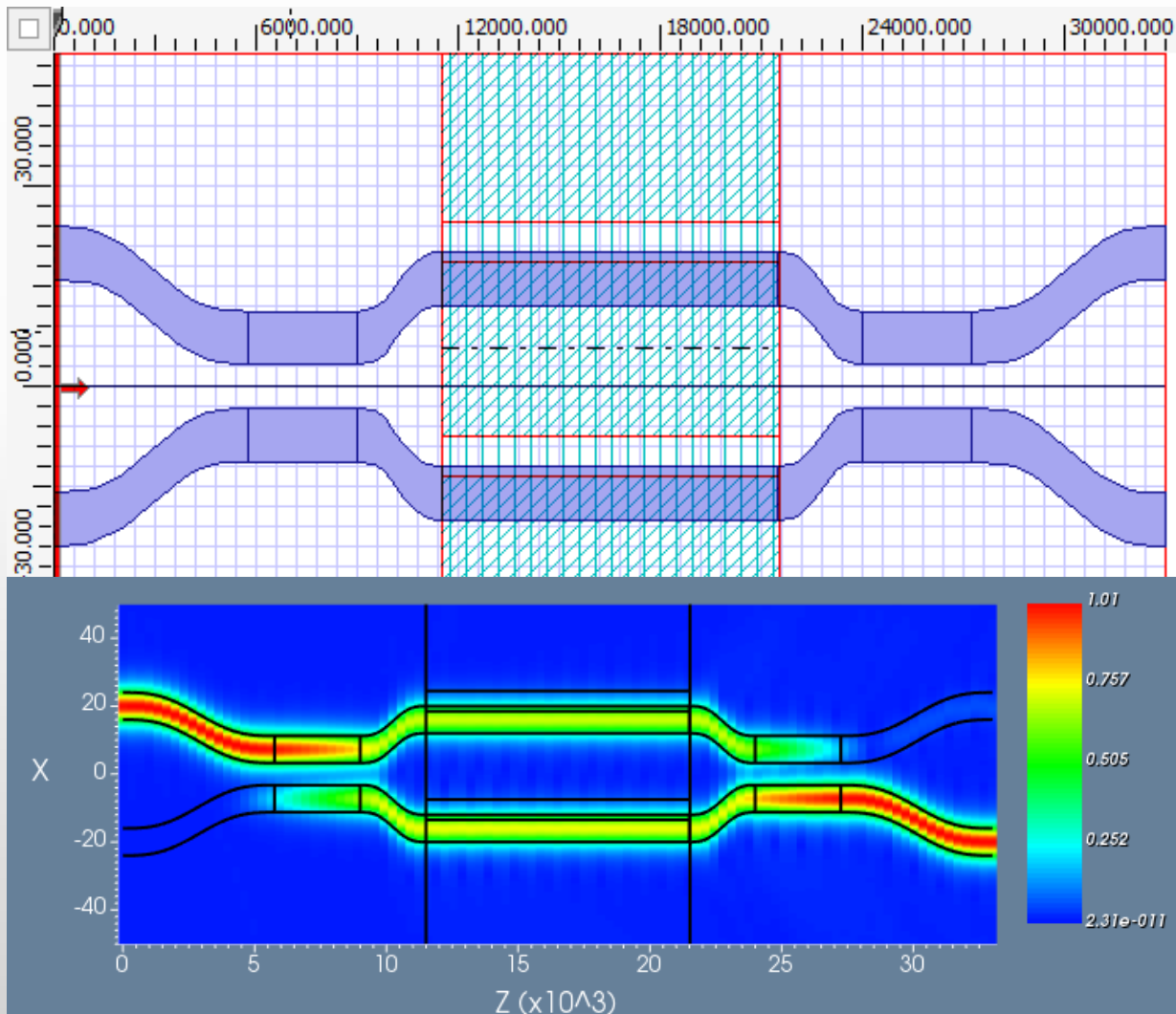




# OptiBPM – Beam Propagation Package



# OPTIBPM



- Beam Propagation Method (BPM)
- Specifically targeting guiding, coupling, switching, splitting, multiplexing, and demultiplexing of optical signals in photonic devices
- Support for modelling diffused LiNbO<sub>3</sub> waveguides and electrodes including physical diffusion parameters
- Parameterization of design
- VBScripting for powerful support for dynamic design and analysis



# OPTIBPM – SELECT APPLICATIONS

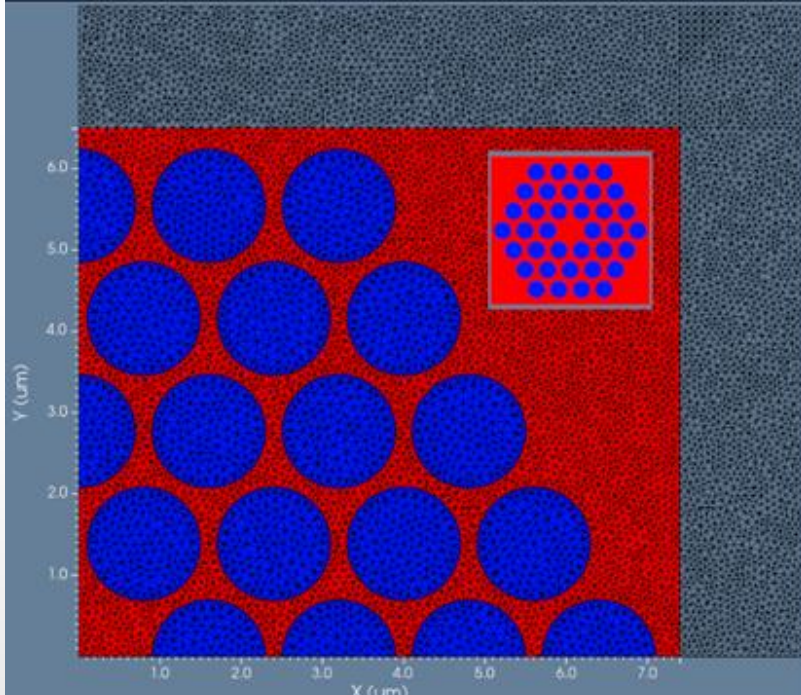
- Design optical splitters, combiners, couplers, multiplexers, and modulators.
- Large scale optical circuit design capabilities
- Model non-symmetrical waveguide structures
- Channel, rib or ridge waveguide design
- Buried waveguides
- Waveguides from a diffused process
- Sensor structures



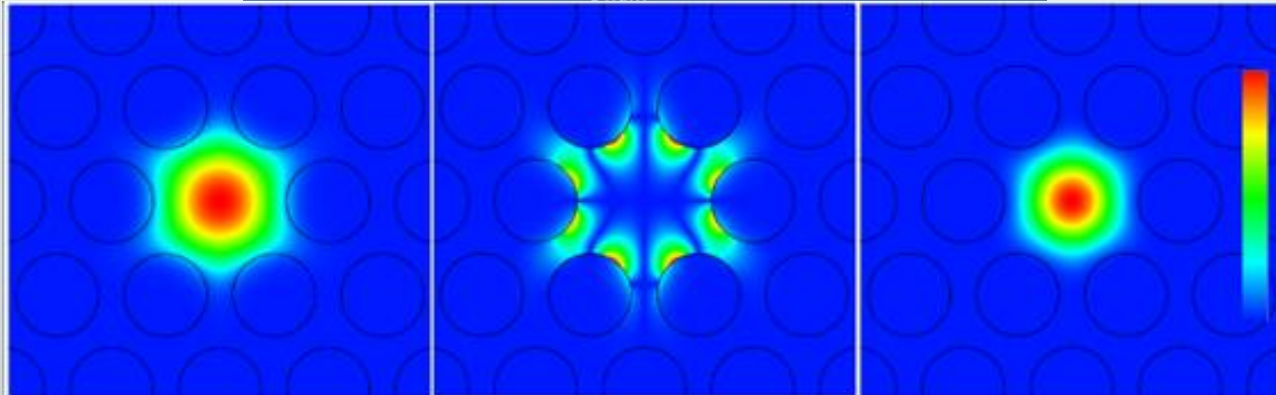
## **OptiMode – Mode Solver Package**



# OPTIMODE



- Advanced mode solving package
- Available as a stand along product and integrated with OptiFDTD / OptiBPM for direct mode injection
- Multiple algorithms (ADI, Aniso, FD, and FEM)
- Support for constant dielectric, diffused waveguide, and electrodes
- Parameterization of design
- VBScripting for powerful support for dynamic design and analysis





**OptiSPICE and Plugins**  
**Opto-Electronic Circuit Design**  
**Simulator**

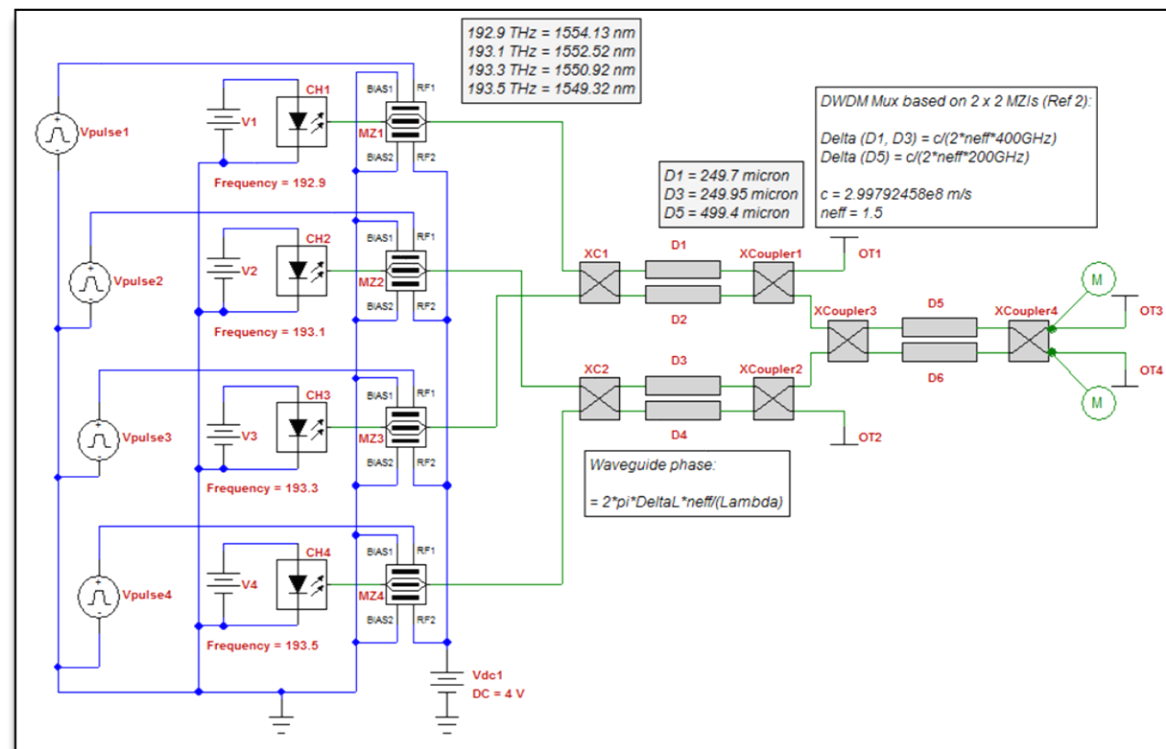
# Contents



- OptiSPICE Overview
- OptiSPICE Standalone vs Plugin
- Application Examples in OptiSPICE Standalone
  - Optical Phase Locked Loop for Homodyne Detection
  - Optical Link Co-Simulation with OptiSystem
- Application Examples using OptiSPICE Plugin in Siemens EDA
  - Higher Order Flat-Top Filter Using S-parameter Model
  - OptiSPICE Plugin – Siemens EDA Tanner Workflow
- PDK Support

# OptiSPICE Overview

- A fully integrated Spice engine based opto-electronics circuit simulator based on modified nodal analysis (MNA)
- Self consistent solution with Newton Raphson iterations
- Set of linear (R,L,C etc..) and nonlinear (BJT, MOSFET etc..) electrical models
- Multi-mode, multi-channel, bidirectional linear (splitter, joiner etc..) and non linear optical models (laser, optical fiber etc..)
- Time and frequency domain solutions and wavelength sweeps
- Optical S-parameters based circuit simulations
- Model thermal behaviour of devices
- Optical-to-electrical S-parameter conversion
- Post-processing capabilities using Python and MATLAB





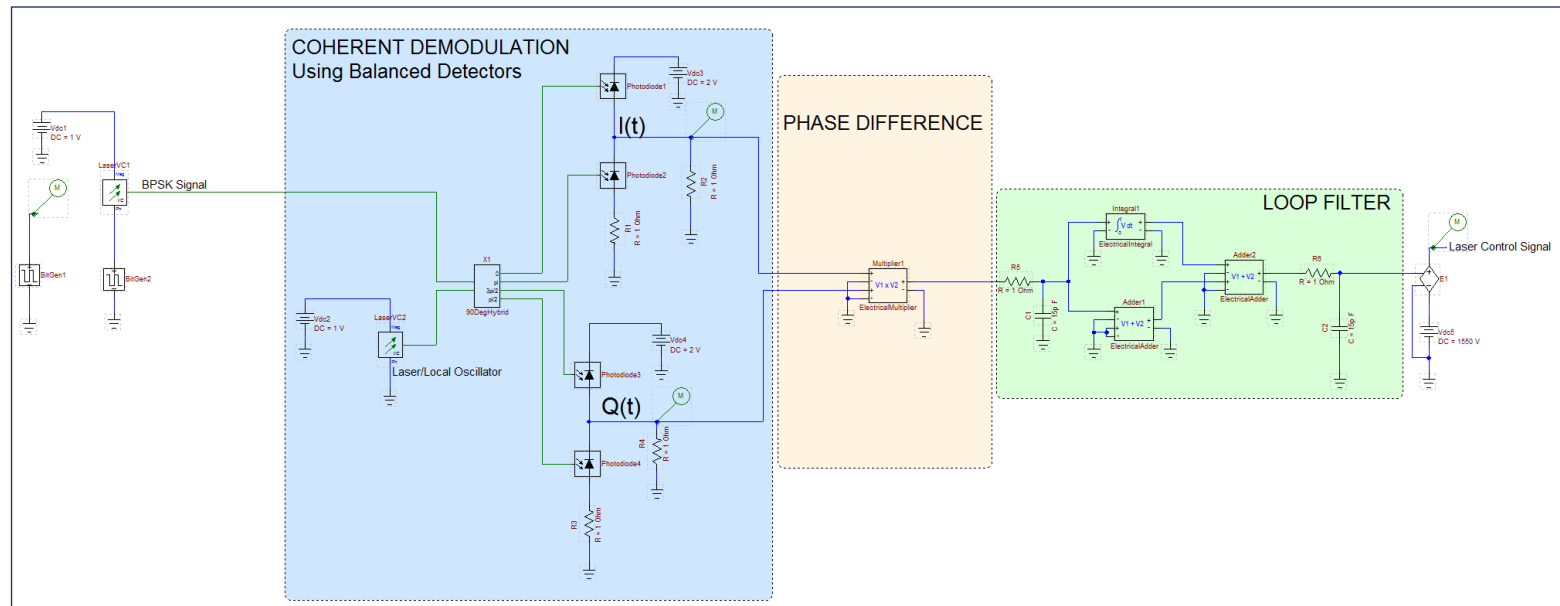
# OptiSPICE Standalone vs. Plugin

OptiSPICE Standalone – Full solution for analog simulation of optoelectronic circuits and devices  
OptiSPICE Plugin – Optical models addon for industry standard electrical design automation tools

	<b>OptiSPICE Standalone</b>	<b>OptiSPICE Plugin</b>
GUI	Optiwave	Siemens EDA
Visualization Tools	Optiwave	Siemens EDA
Electrical Model Library	Optiwave	Siemens EDA
Optical Model Library	Optiwave	Optiwave
Simulation Engine	Optiwave	Siemens EDA
Mask Layout & DRC Tool	NA	Siemens EDA
Optical PDK Compact Models	Optiwave	Optiwave

# Optical Phase Locked Loop for Homodyne Detection

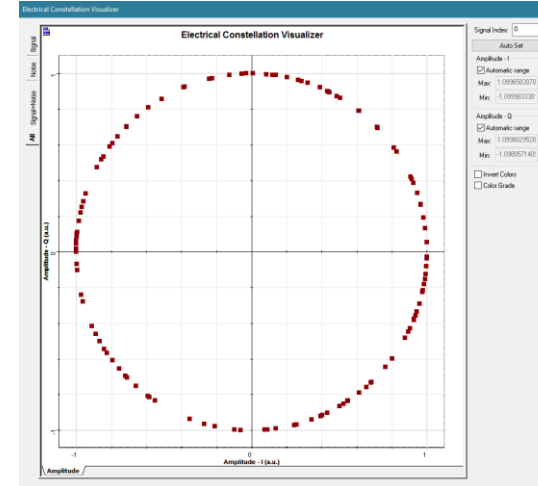
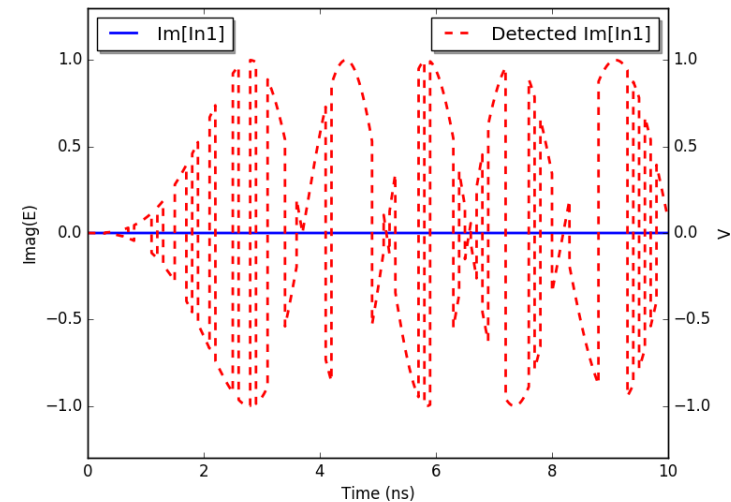
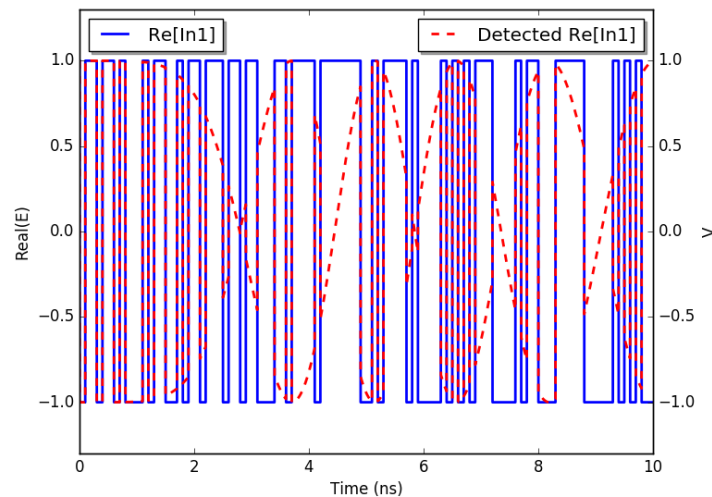
- Signal Generation and Detection
  - BPSK Signal Generator
  - Local Oscillator
  - 90 degree hybrid
  - Balanced detectors
- Phase Difference Calculation
  - Electrical multiplier
  - Detect Phase difference
- Feedback: Generating the control signal
  - Loop Filter
  - DC Offset
  - Generate Control Signal



# Optical Phase Locked Loop for Homodyne Detection

Without the active phase correction of the PLL a constant frequency difference between the local oscillator and the carrier signal detected I and Q do not have the correct phase ( $\pi$  or  $-\pi$  for BPSK). The constant frequency difference results in the rotation of the constellation diagram

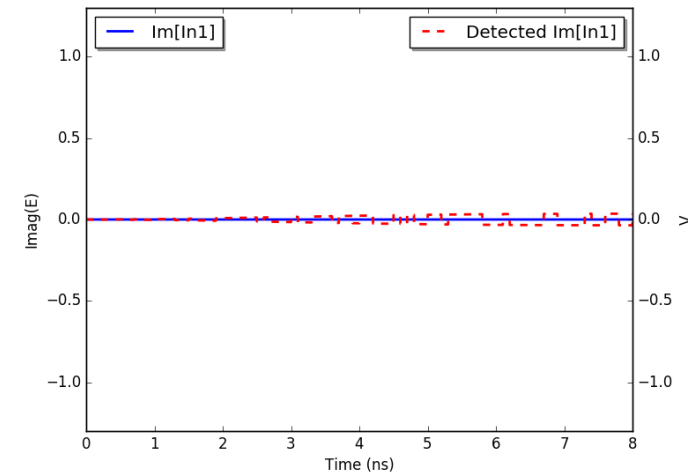
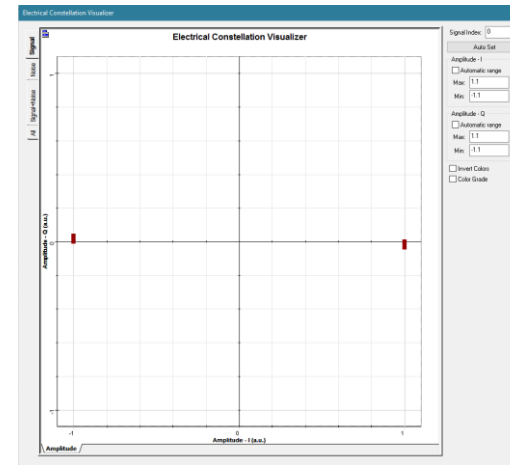
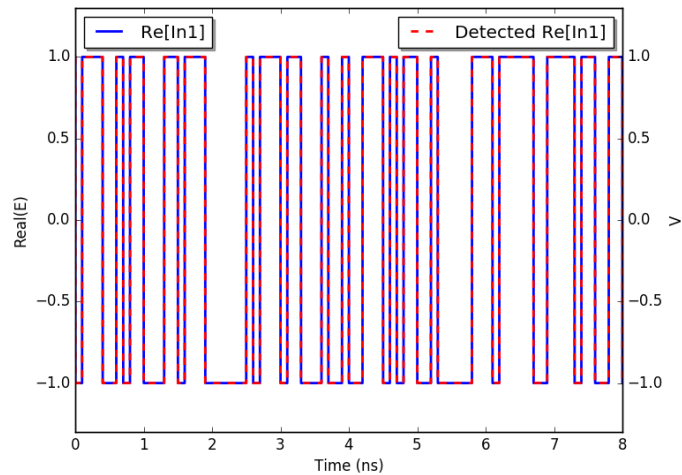
*Phase Locked Loop OFF*



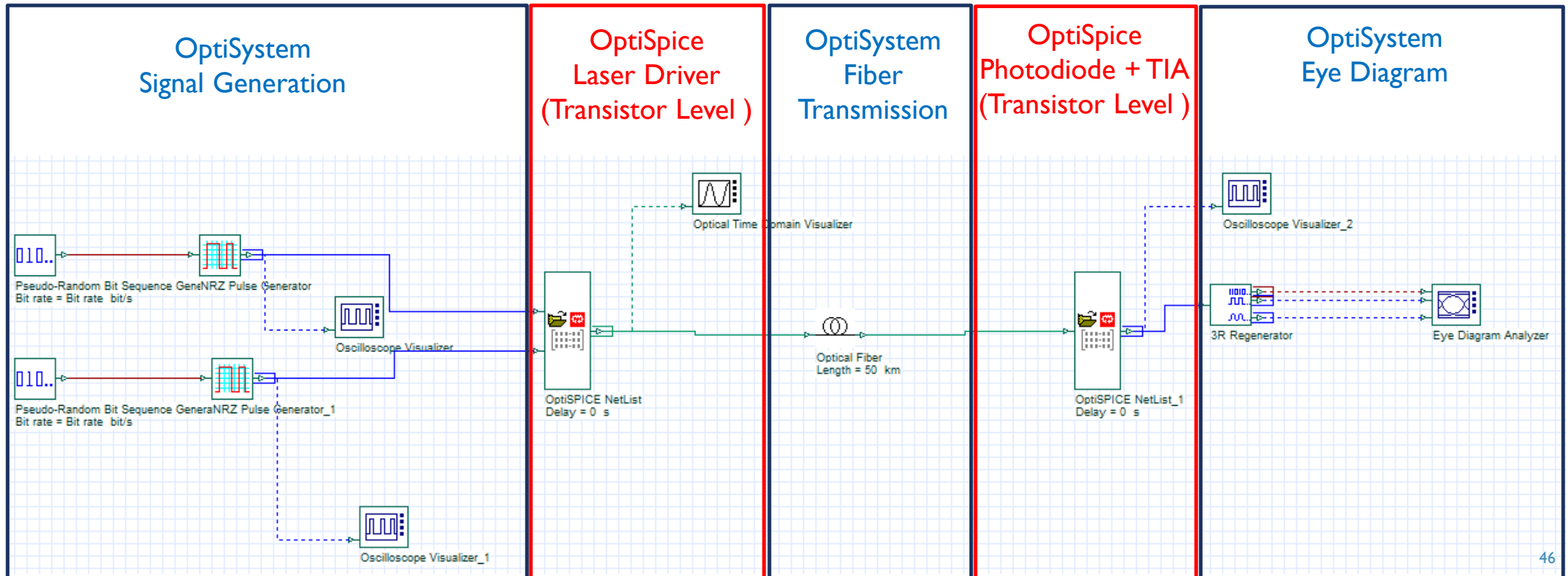
# Optical Phase Locked Loop for Homodyne Detection

When the PLL is activated the frequency/phase of the local oscillator tracks the frequency/phase of the carrier signal. Therefore the detected I and Q have the right phase and the constellation diagram does not rotate

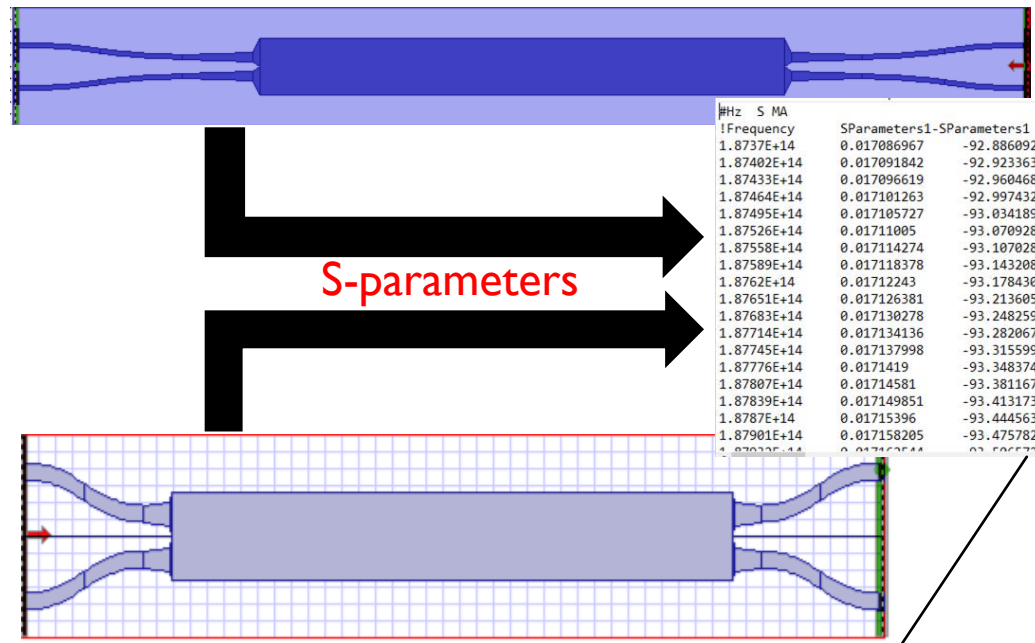
*Phase Locked Loop ON*



# Optical Link Co-Simulation with OptiSystem



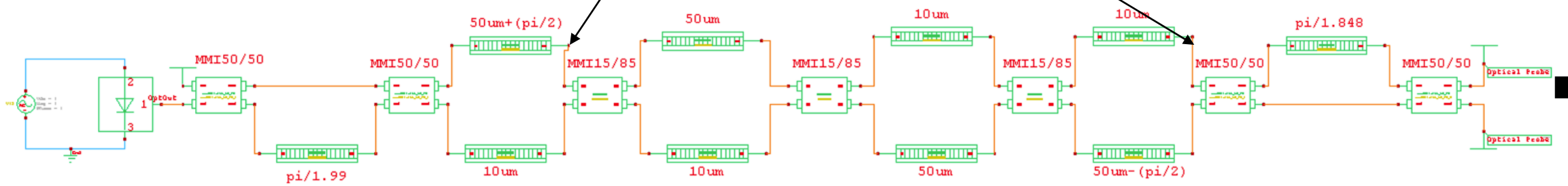
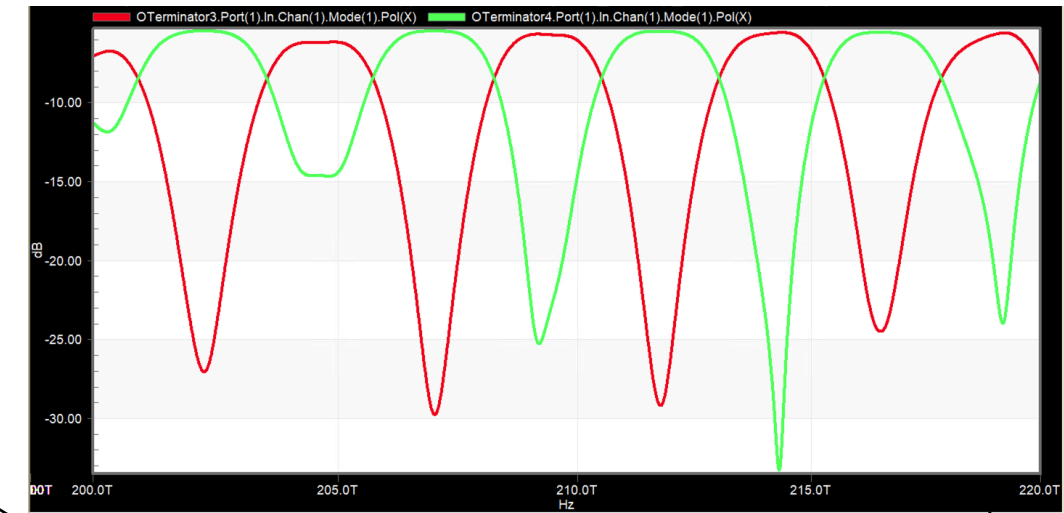
# Higher Order Flat-Top Filter Using S-parameter Model



S-parameters

!Hz S MA	SParameters1-SParameters1		SParameters1-SParameters2	
1.8737E+14	0.017086967	-92.88609205	9.94691E-05	69.62124476
1.87402E+14	0.017091842	-92.92336365	9.94741E-05	69.64843865
1.87433E+14	0.017096619	-92.96046805	9.94899E-05	69.67778572
1.87464E+14	0.017101263	-92.99743234	9.95168E-05	69.70820675
1.87495E+14	0.017105727	-93.03418954	9.95551E-05	69.73864765
1.87526E+14	0.01711005	-93.07092863	9.96045E-05	69.76805016
1.87558E+14	0.017114274	-93.10702817	9.96648E-05	69.7953291
1.87589E+14	0.017118378	-93.14320842	9.97351E-05	69.81955383
1.8762E+14	0.01712243	-93.1784307	9.98146E-05	69.83985512
1.87651E+14	0.017126381	-93.21360554	9.99019E-05	69.85534612
1.87683E+14	0.017130278	-93.24825951	9.99957E-05	69.8655166
1.87714E+14	0.017134136	-93.28206757	0.000100094	69.8697639
1.87745E+14	0.017137998	-93.31559914	0.000100196	69.86763763
1.87776E+14	0.0171419	-93.34837457	0.000100299	69.85900059
1.87807E+14	0.01714581	-93.38116732	0.000100402	69.84391777
1.87839E+14	0.017149851	-93.41317358	0.000100503	69.82244584
1.8787E+14	0.01715396	-93.44456353	0.000100599	69.79496128
1.87901E+14	0.017158205	-93.47578205	0.00010069	69.76172775
1.87932E+14	0.017162444	-93.50673358	0.000100777	69.72354014

## Transmission Response

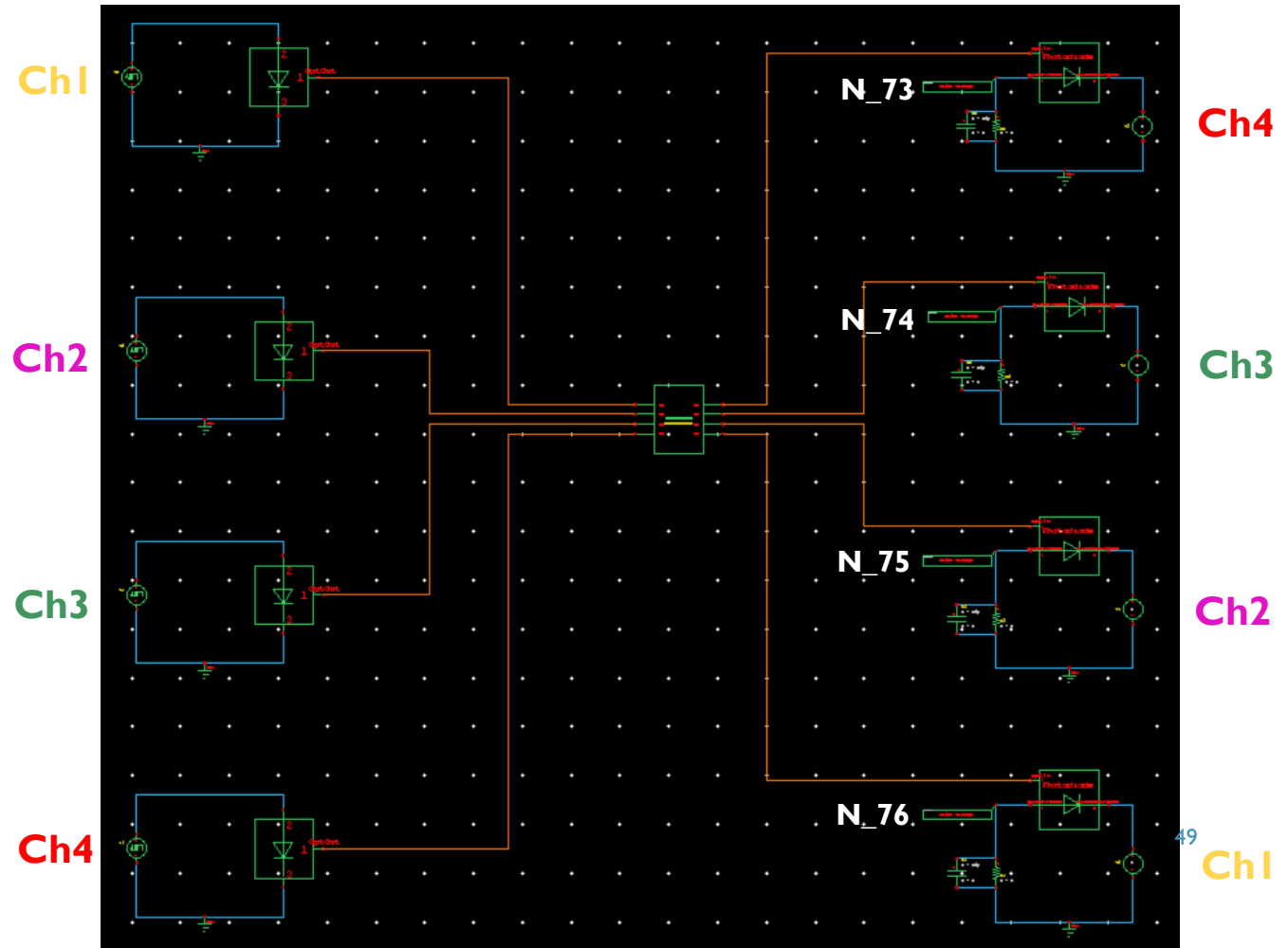






# OptiSPICE Plugin – Siemens EDA Tanner Workflow

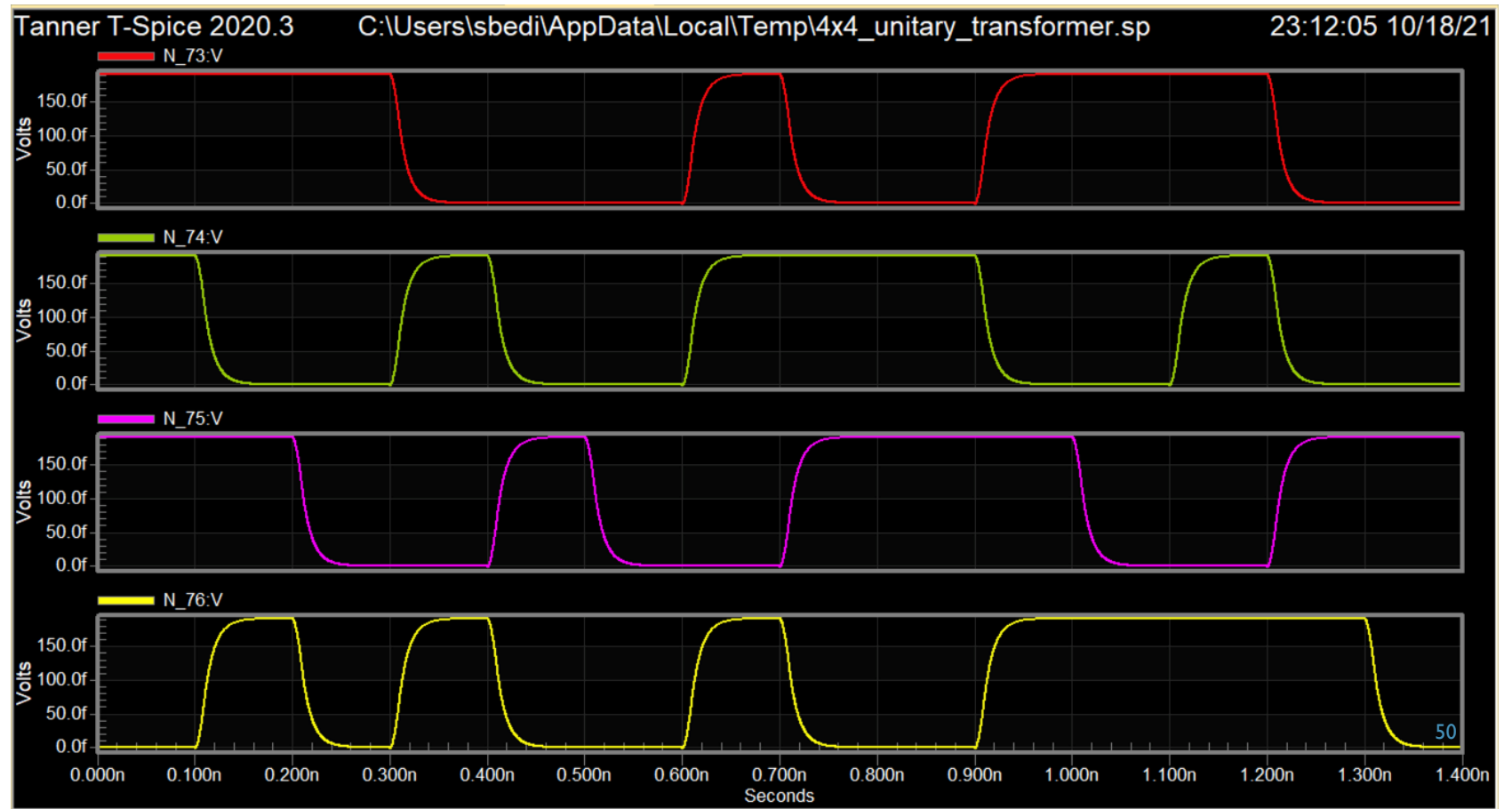
- Create a test-bench and run simulation
- The .SUBCKT has four inputs and four outputs.
- 4 lasers send four different frequency channels 193.1, 193.2, 193.3, 193.4 THz with random bit sequence.
- These random bit sequences are detected at the output using photodiodes.
- Each frequency channel is represented with a separate colour
  - Ch4 [11100010011100]
  - Ch3 [10010011100100]
  - Ch2 [11001001110011]
  - Ch1 [01010010011110]



# OptiSPICE Plugin – Siemens EDA Tanner Workflow

## View results in Tanner Waveform Viewer

- N\_73 = Ch4 [11100010011100]
- N\_74 = Ch3 [10010011100100]
- N\_75 = Ch2 [11001001110011]
- N\_76 = Ch1 [01010010011110]



# PDK Support

- PDKs currently supported/released:
  - Centro Nacional De Microelectronica (CNM) – VLC Photonics PDK
  - Fraunhofer HHI PDK
  - Ligentec PDK
- PDKs support/release in future:
  - Smart Photonics
  - Lionix





THANK YOU

SUPPORT@OPTIWAVE.COM