CodeSScientific

OCSim Modules

Modern Fiber Optic Communication Systems Simulations

With Advanced Level *Matlab* Modules

APPLICATIONS

Kokyo
株式会社光響
住所 : 京都市下京区烏丸通四条下ル水銀屋町637番地 第5長谷ビル2階
Email : info@symphotony.com TEL : 070 - 6582 - 2430
Web : http://www.symphotony.com/ FAX : 075 - 320 - 1604

OCSim Modules**

Modern Fiber Optic Communication Systems Simulations with Advanced Level *Matlab* Modules

Package Includes

Version (2014-15).a
Version 2016.a
Version 2016.b

R&D Levels

Quality Research Papers by Masters / PhD Students and University Faculties

Quality Research Papers and Projects by Government Lab Researchers

Quality R&D Usages by Company Researchers and Engineers

Use or Modify the Existing Modules for Implementation into Companies Software and Hardware Products

APPLICATIONS

QAM-M Coherent Optical OFDM Fiber Optic System Links

Design and simulate:

10 Gb/s, 512 subcarrier, 40 span QAM-M CO-OFDM fiber optic system link
25 Gb/s, 1024 subcarrier 20, span QAM-M CO-OFDM fiber optic system link
40 Gb/s, 2048 subcarrier, 10 span QAM-M CO-OFDM fiber optic system link

n Gb/s, *m* subcarrier, *N* span QAM-M CO-OFDM fiber optic system link
Choose the desired values of *n*, *m* and *N* for simulations.

Explore Further:

Choose the value of M in QAM-M to simulate special cases, e.g., M = 2 for BPSK and M = 4 for QPSK and M = 8, 16, and so on for higher order QAM.

Switch on to *nonlinearity* to design and simulate *nonlinear* QAM-M CO-OFDM fiber optic system links.

Coherent QPSK Fiber Optic System Links with Digital Signal Processing

Design and simulate:

28 GBaud, 20 span coherent QPSK fiber optic system link
10 GBaud, 60 span coherent QPSK fiber optic system link
28 GBaud, 20 span Nyquist pulse coherent QPSK fiber optic system link
10 GBaud, 60 span Nyquist pulse coherent QPSK fiber optic system link

n GBaud, *N* span coherent QPSK fiber optic system link
n GBaud, *N* span Nyquist pulse coherent QPSK fiber optic system link
Choose the desired values of *n* and *N* for simulations.

Explore Further:

Compensate Laser Phase Noise, Chromatic Dispersion and SPM through Digital Signal Processing in coherent QPSK fiber optic system links.

Modify to coherent *DP-QPSK* fiber optic system link. *Scientific and Programing support is available for modifying to coherent DP-QPSK fiber optic system link.*

WDM Direct Detection Fiber Optic System Links

Design and simulate:

28 Gb/s/channel, 50 GHz channel spacing, 8 channel, 20 span WDM fiber optic system link
10 Gb/s/channel, 25 GHz channel spacing, 16 channel, 40 span WDM fiber optic system link
40 Gb/s/channel, 100 GHz channel spacing, 8 channel, 20 span WDM fiber optic system link

n Gb/s/channel, *m* GHz channel spacing, *M* channel *N* span WDM fiber optic system link
Choose the desired values of *n*, *m*, *M* and *N* for simulations.

Explore Further:
Switch on to *nonlinearity* to design and simulate *nonlinear* WDM fiber optic system links.

Intensity Modulated Direct Detection (IMDD) Fiber Optic System Links

Design and simulate:

10 Gb/s, 40 span IMDD fiber optic system link
28 Gb/s, 20 span IMDD fiber optic system link with inline dispersion compensation
40 Gb/s, 20 span IMDD fiber optic system link with inline dispersion compensation
40 Gb/s, 20 span IMDD fiber optic system link with dispersion managed fiber

n Gb/s, *N* span IMDD fiber optic system link
Choose the desired values of *n* and *N* for simulations.

Explore Further:
Switch on to *nonlinearity* to design and simulate *nonlinear* IMDD fiber optic system links.

Optical Transmitters

Design and simulate:

OOK Optical Transmitters
NRZ – OOK Optical Transmitters with Dual Drive MZM

PSK Optical Transmitters
NRZ – PSK Optical Transmitters with Dual Drive MZM

QPSK Optical Transmitters
NRZ – QPSK Optical Transmitters with Dual Drive MZM

QPSK - Nyquist Optical Transmitters
QPSK – Nyquist Optical Transmitters with Dual Drive MZM

QAM - M Optical Transmitters
QAM-M OFDM Optical Transmitter with IQ Mach-Zehnder Modulator (MZM)

PAM - M Optical Transmitters
PAM – 4,8,16 Single Channel Optical Transmitters with PAM-M *Nonlinear* Modulator for High Bandwidth Fiber Optic Networks and Data Centres

Modify to DP-QPSK Optical Transmitters. *Scientific and Programing support is available for modifying to DP-QPSK optical transmitters.*

Optical Receivers

Design and simulate:

Shot Noise, Thermal Noise and Signal-to-Noise Ratio of Direct Detection Optical Receivers

Error Probability of OOK and PSK data for Optical Homodyne Receivers

Error Probability of OOK, PSK and FSK data for Optical Heterodyne Receivers

Error Probability of OOK, FSK and DPSK data for Optical Direct Detection Receivers

OFDM Receiver with Optical Coherent Detection

Optical Sources

Design and simulate:

Carrier Density and Optical Power of Laser Diodes for DC Currents

Carrier Density and Optical Power of Laser Diodes for Pulsed Currents

Optical Fiber Impairments

Design and simulate:

Nonlinear Pulse Propagation in Optical Fibers

Optical Fiber Amplifiers

Design and simulate:

Raman Gains in Optical Fibers using Nonlinear Coupled Differential Equations

EDFA Gains in Optical Fibers using Nonlinear Coupled Differential Equations

Optical Fiber Modes and Dispersion

Design and simulate:

LP Modes in an Optical Fiber

Dispersion in an Optical Fiber

Optical Field Envelope / Total Field Propagation in an Optical Fiber

Few Mode EDFA for SDM

Design and simulate:

Few Mode EDFA for Space Division Multiplexing

Features

Type of Licenses: (i) Academic Research, (ii) Government Lab Research, and (iii) Company Research.

Modules Type: Matlab (.m) files.

Manuals with well explained related theory, formulas and descriptions.

Email support on general, research and programing level questions on OCSim Modules by our experts who are PhDs in Photonics and Optical Communication Systems is **free for two years.**

Updates on existing modules are **free for two years.**

Any new Add-on released in future will cost extra amount as the modules are continuously upgraded every year with incorporating latest research and new topics.

Follow the Expert

“We have been using the Fiber Optic Communication Systems Simulations Advanced Matlab Modules for the last 12 years for publishing research papers, theses and laboratory simulation experiments. In these modules, the underlying complex theories and equations of fiber optic communication systems have been converted into source code programs giving the insight into the concepts involved and more understanding of the subject. Starting from the first principles, academicians, engineers and researchers in universities and companies can go up to the most modern fiber optic communication systems including the latest analog and digital modulation techniques like BPSK, QPSK, PM – QPSK or DP-QPSK, QAM and PAM-M.“

(Professor Shiva Kumar (Ph.D. Engineering, Osaka University, Japan), now with the Electrical and Computer Engineering Department, McMaster University, Canada)

JAPAN Distributor

Kokyo, Inc.

No.5 Hase Bldg. 2F, 637, Suiginyacho
Shimogyo-ku Kyoto-shi
Kyoto, 600-8411
JAPAN

Tel.: 070-6925-5558
Email: info@symphotony.com
Web: www.symphotony.com

HEAD QUARTER

CodeSScientific

118 Bufflehead Way
Ottawa, ON, K1T 0G3
Canada

Tel. (Voice and Message): 1.613.325.7594

sales@codesscientific.com
www.codesscientific.com

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