Course Number H7214B Opt. 205, Dedicated

Characterizing Polarization Effects

Course Overview

Course Overview

Gain an understanding of polarization fundamentals. Learn to efficiently use the Agilent Technologies 8509B lightwave polarization analyzer to characterize polarization effects in components and fibers.

What you will learn

- Instruction in the use of the Agilent 8509B lightwave polarization analyzer (hands on).
- Tutorial instruction in polarization concepts and terminology, including polarization ellipse, Jones and Stokes vectors and matrices, Poincare sphere, degree of polarization, and source coherence
- Definitions and measurement techniques for the following attributes: Polarization Mode Dispersion (PMD), Polarization Dependent Loss (PDL), and Polarization Maintaining Fiber (PMF) crosstalk.

Instruction in the remote control of instruments is not included in this course.

Specifications

Course Type
Application Training

Audience
Engineers and advanced technicians who are or will be involved in the characterization of polarization effects

Prerequisites
Elements of Lightwave Technology course H7214B Opt. 100 or equivalent experience

Course Length
8 hours

Delivery Method
Dedicated – at customer's site using customer's equipment

Course Format
Course content is about 50% lecture and 50% lab.

Detailed Course Agenda

This course is divided into core and optional modules.

Core modules:

- Polarization properties of signals and components
- Agilent 8509B user training

Optional modules:

- Measurement of Polarization Dependent Loss (PDL)
- Introduction of Polarization Mode Dispersion (PMD)
- Measurement of PMD
- Polarization control concepts and applications
- Polarization Maintaining (PM) fiber measurements

Contents of all modules are listed below.

Contents of Core Modules

Polarization properties of signals and devices

Detailed presentation, discussion:

- Concepts of polarized and unpolarized light
- The Stokes parameters and the Mueller matrix
- The Jones vector and the Jones matrix
- The Poincare sphere
- Coherence
- Polarizing devices (polarizer, retarder, rotator)
- Polarimetry (polarization measurement)

Agilent 8509B polarization analyzer training

Detailed presentation, demonstration, hands-on labs:

- Use of instrument controls and displays
- Measuring the polarization characteristics of signals
- Timed measurements
- Creating a polarization reference frame
- Measuring PDL: Jones matrix and all-states methods
- Measuring PMD: JME and wavelength scan methods
- Measuring crosstalk in Polarization Maintaining (PM) fiber

Measurement of PDL (Polarization Dependent Loss)

- Definition of PDL, origins, and typical values
- The Poincare sphere model
- PDL measurement methods
- Polarization dependence of other attributes (center wavelength, bandwidth, crosstalk)

Introduction of PMD (Polarization-Mode Dispersion)

- System impact of PMD
- Origins of PMD in fiber and components
- Polarization mode coupling and coupling length
- The “Principal States” model of PMD
- The statistical character of PMD

Measurement of PMD

- Frequency domain methods
  - Poincare sphere arc
  - Fixed analyzer (wavelength, scanning)
  - Jones Matrix Eigenanalysis (JME)
- Time domain methods
  - Pulse time of flight
  - Modulation phase shift
  - Low coherence interferometry

Polarization control concepts and application

- Scanning, scrambling, synthesis, tracking
- Agilent polarization controllers (11896A, 8169A)

Polarization Maintaining (PM) fiber measurements

- Type of polarization-maintaining fiber
- Typical applications
- Guiding of linearly polarized light
- Polarization crosstalk measurement

Ordering Information

To order the *Characterizing Polarization Effects* course (H7214B Opt. 205), call:
US (800) 593-6632
Canada (800) 561-3276

The Agilent Customer Registration Center can provide you with price and enrollment information about scheduled courses or a dedicated course which can be customized to meet your specific needs.

You may also register or request additional information online at: www.agilent.com/find/tmeducation

By internet, phone, or fax, get assistance with all your test and measurement needs.

Online Assistance
www.agilent.com/find/assist

Phone or Fax
United States:
(tel) 1 800 452 4844

Canada:
(tel) 1 877 894 4414
(fax) (905) 206 4120

Europe:
(tel) (31 20) 547 2323
(fax) (31 20) 547 2390

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Latin America:
(tel) (305) 267 4245
(fax) (305) 267 4286

Australia:
(tel) 1 800 629 485
(fax) (61 3) 9272 0749

New Zealand:
(tel) 0 800 738 378
(fax) (64 4) 495 8950

Asia Pacific:
(tel) (852) 3197 7777
(fax) (852) 2506 9284

Product specifications and descriptions in this document subject to change without notice.

Printed in U.S.A. 4/00
5968-5256E

Agilent Technologies
Innovating the HP Way