Advanced EM in PathWave ADS class

Course Overview

Keysight Technologies offers a modularly structured training course of the 3D Method of Moments (Momentum) and Finite Element Method (FEM) electromagnetic simulators integrated into the Advanced Design System (ADS). The course can be configured by customers, depending on their unique requirements, to address either engineers completely new to the technology or engineers who have already used the tool for a number of years but may not have been able to delve into the more advanced capabilities of the simulators or are new to one of the simulation technologies.

What you will learn

- Common EM GUI for Momentum and FEM
- Mapping layouts into 3D solid models
- Momentum RF vs. Momentum Microwave
- Perturbational optimization
- Visualizing currents and EM fields
- Patch and other antennas and radiation patterns
- Efficient via modeling
- Defining multilayer structures using slot layers
- CPW simulations using positive and negative masks
- Differential line modeling and mixed-mode S-Parameters
- Using S-Parameters for powerloss analysis of passive structures
- Creating EM Components for cosimulations and cooptimizations in schematics
- EM Component parameterization methods
- Using custom AEL artwork to create complex parameterized EM Components
- Finite metal thickness vs. 2D sheet metal modeling
- Layout Preprocessor for efficient EM simulations of complex designs
- IC, LTCC package modeling
- Multitechnology simulations for SiP, PoP, MCM designs
- Integration of arbitrary 3D components from EMPro within ADS models (connectors, packages, transitions, etc.)
- Bondwire modeling and compensation techniques and much more…

Audience

Engineers and scientists who work in an RF, microwave or mm-wave design environment and want an in-depth understanding of designing circuits using the dominant 3D EM simulation technologies.

Prerequisites

Knowledge of ADS layout and schematic capture, circuit simulations and data display. Familiarity with fundamental RF and microwave concepts.
PC and MS Windows experience.

Course Length

3 days

Course Format

The course combines lecture presentations with instructor guided student labs.

Delivery Location

To be defined

Delivery Dates

To be defined

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For registration or information please contact your training center
At: pdl-pathwave-design-software-training@keysight.com

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Detailed Course Agenda:

EM Component Parameterization, Cosimulation & Cooptimization

EM Component parameterization is the basis for EM-circuit-system cooptimizations.
Learn the two methods to convert static to parameterized geometries – Nominal/Perturbed
graphical and Subcircuit component based.

Compare traditional "puzzle-piece" modeling approaches to modeling an entire geometry in a single EM simulation. Understand and efficiently use thick conductor modeling using LTCC spiral inductors as examples. For custom geometries with complex parameterization
requirements, learn how to define AEL artwork macros and convert them to EM Components.

Efficient CPW & Multilayer Modeling & Analysis of Differential Structures

Use slot layers to efficiently model (CPW) Coplanar Waveguide and multilayer PCB structures. Learn the different grounding concepts such as localized grounds and return paths vs. ground at infinity, and differential signaling. Perform pure differential and mixed-mode (common–differential) S-Parameter simulations using schematic templates and DDS equations and understand the implications this has on real-world differential signal routing.

Multitechnology Structures, IC Packaging, Modules, SiP

The Finite Element Method is the most general 3D simulation technique and allows users to simulate IC or multi-chip module packages and many other structures that Momentum cannot represent. FEM can also be used to validate Momentum simulations to increase confidence levels. In this module, you will also learn why building 3D models from a 2D layout user-interface has significant benefits over having to draw 3D structures in a CAD UI.

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