

WSA: State-of-the-Art Filter Design Using EM and Circuit Simulation Techniques

Abstract Significant advances in computational electromagnetics continue to be made. They have been implemented in widely available commercial software as well as dedicated in-house software. They are applied to microwave filter simulation, modeling, synthesis and design, and EM validation. They are accompanied by novel modeling and design concepts involving parameterization of arbitrary geometries, space mapping and surrogate modeling, the adjoint sensitivity method, reduced-order modeling and equivalent circuit extraction, artificial neural network representation, genetic algorithms and fast frequency sweeps.

Optimal design more closely and automatically integrates EM and circuit simulations directly into the design and manufacturing process in a manner increasingly transparent to the designer. This workshop will address the state of the art from component modeling to multiplexer design. Expectations of using EM simulators as effective tools in an automated design environment continue to be raised based on considerable work currently in progress. We emphasize optimization methodologies as a cornerstone in simulation, modeling, design and manufacturing.

This workshop will draw upon the popularity and success of recent workshops involving electromagnetics and CAD. A balance between theory, implementation and practical discussions of computational and design issues will be struck so that the workshop will have wide appeal

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Sponsor MTT-1, Computer-Aided Design
MTT-8, Filters and Passive Components

Technical level Tutorial & Advanced

Day/ Time Sunday, May 20; 8:00 AM to 5:00 PM

Room To be assigned.

Speakers Applications of Space Mapping Optimization Technology to Filter Design
John Bandler, Bandler Corporation

Filter Design Using Fast Planar EM Simulations
Radek Biernacki, Agilent EEsof EDA, USA

Direct Global Electromagnetic Optimization of Microwave Filters
Stephane Bila, IRCOM, France

Direct EM Design of a Class of Rectangular Waveguide Dual Mode Filters
Marco Guglielmi, ESA ESTEC, The Netherlands

Filters and Multiplexers for Space Application - Design Methods
Dietmar Schmitt, Bosch, Germany

Synthesis of Filters with Frequency-Variable Couplings (FVC)
Dick Snyder, RS Microwave Company, USA

Fast Analysis and Optimization of Coupled Line Filters Using FEM
Dan Swanson, Bartley RF Systems, USA

Advanced Simulation/Design Techniques for Microwave Filters
Ming Yu, COM DEV International

Circuit Elements/Coupling Matrix Conversion to Physical Filter Dimensions Using EM Simulations
Kawthar Zaki, University of Maryland, USA