

# Call for Papers

IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

## Special Issue

on

## Automated Circuit Design Using Electromagnetic Simulators

Recent advances in microwave CAD technology, the availability of powerful workstations and massively parallel systems, suggest the feasibility of interfacing electromagnetic (EM) simulations into optimization systems or CAD frameworks for direct application of powerful optimizers. With fast, robust, commercial EM simulators increasingly available, microwave engineers are already pushing the frontiers beyond traditional uses of EM simulators. The new thrust is to integrate EM simulations directly into the linear/nonlinear circuit design process in a manner transparent to the designer. This Special Issue, to be published in August 1997, addresses the evolution of this novel art and exciting new directions of research and development. Expectations of using EM simulations as effective tools in an *automated* design environment have been raised, based on the considerable and excellent work currently in progress. This emerging design technology is expected to be a cornerstone of future integrated CAD systems. Novel theoretical contributions as well as practical applications and software implementational aspects are encouraged. Topics of particular interest include but are not limited to:

- Design with tolerances and yield-driven design using EM simulators
- Implementable adjoint parameter sensitivity computations
- Automatic layout optimization with EM validation
- Techniques for capturing and automating parameterization of 2D and 3D geometries
- Novel parameterized geometrical model primitives
- Scalable models for optimization
- Space Mapping optimization
- Quasi-global modeling of EM simulated subcircuits and devices
- Parameter extraction methodologies for companion modeling
- Novel techniques for numerical, geometrical and EM decomposition
- Optimization strategies for complex and irregular shapes
- Active device physical/EM simulation and optimization
- Use of supercomputers, massively parallel and heterogeneous workstations
- Novel software architectures for EM optimization environments
- Use of data bases and automated table look-up for EM simulations
- Multidimensional response approximation and effective interpolation techniques
- Exploitation of meshing, simulation accuracy and simulation speed
- Techniques for inverse electromagnetic problems
- Visualization for automated EM design
- Mixed analytical, empirical and numerical EM simulation and optimization
- Merging of linear/nonlinear circuit theoretic and field-theoretic simulations
- Asymptotic waveform techniques applied to EM simulations
- Optimization techniques for chip compaction
- Optimization in the frequency, time and mixed domains
- Applications: filters, multiplexers, antennas, waveguides, MMICs, interconnects, etc.

Authors should submit five copies of their paper describing original work by June 3, 1996 to the Guest Editor:

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