Call for Papers for Special Issue of IEEE Transactions on Electron Devices on Advanced Compact Models and 45-nm Modeling Challenges

The special issue is devoted to the research and development activities on emerging compact models for advanced circuit simulation using 65-nm silicon technology and below. The continuous scaling of CMOS devices to sub-100 nm regime has resulted in higher device density, faster circuit speed, and lower power dissipation. Many new physical phenomena such as 2d/3d electrostatic effects, remote surface roughness scattering, mobility degradation, impact ionization, band-to-band tunneling, velocity over-shoot, self-heating, channel quantization, polysilicon depletion, radio frequency (RF) behaviors, non-quasi static (NQS) effects, and discrete dopants become significant as the device dimension approaches to its physical limit. Thus, accurate MOSFET models that include the observed new physical phenomena are crucial to design and optimize advanced VLSI circuits for 65-nm CMOS technology and below.

The presently available compact models, based-on regional approach, are facing enormous challenges in modeling the observed physical phenomena in sub-90 nm technologies. Therefore, advanced physics-based compact models are critical for an accurate modeling of integrated circuits using advanced technologies. The reported data indicate that the emerging MOS compact models based on surface potential and/or inversion charge show an excellent promise for sub-90 nm technologies. Therefore, the objective of this special issue is to bring together a diversity of R&D activities and advancement in compact MOS and emerging device models as well as models for the active and passive components integrated in sub-65 nm silicon technologies, parameter extraction techniques, model validation, statistical modeling, and mixed-mode simulation. A partial list of the areas of interest is:

- Emerging Compact MOS Models
- RF and Noise Modeling
- Modeling NQS Effects
- Emerging Interconnect Models
- Compact Models for Emerging Devices
- Model Validation
- Statistical Modeling
- Mixed-mode Simulation

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