

MULTI-LEVEL MIXED-TECHNOLOGY SYSTEM-LEVEL SIMULATION

S.P. Levitan* and D.M. Chiarulli

University of Pittsburgh, Pittsburgh, PA 15260 USA

The confluence of “system on a chip” integration levels with new micro-scale optical, optoelectronic and electromechanical components has enabled the fabrication of an entirely new class of systems: Mixed technology micro-systems that have the potential of drastically reducing the size and cost of digital communications and computation systems. We present an overview of our multi-level mixed-technology simulation environment, Chatoyant, which supports micro-scale mixed technology system design. This includes four main topics: light propagation models for micro-optics, mixed-domain component models for electronics, mechanics, and optics, a corresponding mixed-domain simulation environment, and design and analysis techniques that can use these simulations to close the synthesis/analysis design loop.