Abstract

The objective of this thesis is the development of a new Green's function Monte Carlo algorithm for the two-dimensional wave equation. Historically, the Monte Carlo method had not been well-adapted to the solution of hyperbolic equations, though the mathematical preliminaries of a stochastic model for hyperbolic equations such as the telegrapher's equation, is well-established in literature. The newly developed algorithm has been validated with analytical benchmarks and excellent agreement has been obtained between analytical and numerical results. This algorithm has potential applications in diverse areas ranging from the design of antennas and radars to the full-wave analysis of IC interconnect structures.