Abstracts

Cellular Automata as an Environment for Simulating Electromagnetic Phenomena

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In this letter, the application of cellular automata to the modeling of electromagnetic phenomena is investigated. Cellular automata are fully discrete computational models (in space, time, and variables) and are exactly computable using digital hardware. One type of cellular automata, the HPP lattice gas automaton, is applied here to the modeling of two-dimensional electromagnetic field problems. Lattice gas automata can be completely described in terms of binary variables and are capable of providing linear wave behavior. Two examples are presented to explore the proposed approach: one-dimensional plane wave propagation and plane wave scattering from a perfectly conducting rectangular cylinder.

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