



# Adaptive Mesh Refinement in Time-Domain Numerical Electromagnetics

By Costas D. Sarris

Morgan Claypool Publishers, United States, 2007. Paperback. Book Condition: New. 231 x 185 mm. Language: English . Brand New Book. This monograph is a comprehensive presentation of state-of-the-art methodologies that can dramatically enhance the efficiency of the finite-difference time-domain (FDTD) technique, the most popular electromagnetic field solver of the time-domain form of Maxwell s equations. These methodologies are aimed at optimally tailoring the computational resources needed for the wideband simulation of microwave and optical structures to their geometry, as well as the nature of the field solutions they support. That is achieved by the development of robust adaptive meshing approaches, which amount to varying the total number of unknown field quantities in the course of the simulation to adapt to temporally or spatially localized field features. While mesh adaptation is an extremely desirable FDTD feature, known to reduce simulation times by orders of magnitude, it is not always robust. The specific techniques presented in this book are characterized by stability and robustness. Therefore, they are excellent computer analysis and design (CAD) tools. The book starts by introducing the FDTD technique, along with challenges related to its application to the analysis of real-life microwave and optical structures. It then proceeds to...



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