Abstracts

Efficient calculation of effective material parameters in metamaterials using FDTD and a modal approach

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We present an efficient modal approach in combination with the Finite Integration Technique (FIT) - a generalized FDTD-like method - to analyze resonant structures. Rather than performing time-consuming time-stepping of long transients, the eigenmodes of the spatial discretization operators are utilized to extract frequency-domain parameters of the simulated devices. As an application we calculate averaged material parameters of recently proposed so-called metamaterials, which show a distinctive resonant behavior with negative permittivity and permeability in a certain frequency range.

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