

Abstracts

Efficient ARMA modeling of FDTD time sequences for microwave resonant structures

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The finite-difference time-domain (FDTD) method requires computation of very long time sequences (TS) to accurately characterize the slowly decaying transient tail of resonant and/or electrically large structures. Therefore, it becomes critical to investigate methods of reducing the computational time for such objects. In this paper, we present a new signal processing algorithm, which uses significantly lower model orders than those employed in existing Prony-based algorithms, to extrapolate the late-time signature accurately from the moderately early-time TS. The robustness and accuracy of the new method are illustrated by the FDTD simulation and experimental corroboration of a high-Q microstrip filter, an example of a resonant structure.

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