Abstracts

A New Method for the Transient Simulation of Causal Linear Systems Described in the Frequency Domain

T.J. Brazil. "A New Method for the Transient Simulation of Causal Linear Systems Described in the Frequency Domain." 1992 MTT-S International Microwave Symposium Digest 92.3 (1992 Vol. III [MWSYM]): 1485-1488.

A convolution-based method is described for the transient analysis of causal linear systems. The main novelty lies in the method proposed for computing discrete impulse response samples, which possess excellent frequency interpolation properties to the system function, even though comparatively few samples are used. Convolution operations are accordingly highly efficient, and results are presented to validate the method in comparison to (a) theoretical analysis, (b) SPICE simulation, and (c) experimental step-response results for a lossy microstrip filter. Extensions of the method to more general nonlinear transient simulation are conceptually straightforward.

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