Abstracts

Generation of a wide-band electromagnetic response through a Laguerre expansion using early-time and low-frequency data

T.K. Sarkar and Jinhwan Koh. "Generation of a wide-band electromagnetic response through a Laguerre expansion using early-time and low-frequency data." 2002 Transactions on Microwave Theory and Techniques 50.5 (May 2002 [T-MTT]): 1408-1416.

The objective of this paper is to generate a wide-band and temporal response for three-dimensional conducting structures. This is accomplished through the use of a hybrid method that involves generation of early-time and low-frequency information for the electromagnetic structure of interest. These two, early-time and low-frequency information, are mutually complementary and contain all the necessary information for an ultrawide-band response for a sufficient record length. The time-domain response is modeled as a Laguerre series expansion. The frequency-domain response is also expressed in an analytic form using the same expansion coefficients used in modeling of the time-domain response. The data in both the domains is used to solve for the polynomial coefficients in a data-fitting procedure. Once the polynomial coefficients are known, the available data is simultaneously extrapolated in both domains. This approach is attractive because expansions with a few terms give good extrapolation in both time and frequency domains. The computation involved is minimal with this method.

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