Abstracts

Extrapolation of electromagnetic responses from conducting objects in time and frequency domains

M.M. Rao, T.K. Sarkar, R.S. Adve, T. Anjali and J.F. Callejon. "Extrapolation of electromagnetic responses from conducting objects in time and frequency domains." 1999 Transactions on Microwave Theory and Techniques 47.10 (Oct. 1999 [T-MTT]): 1964-1974.

Utilizing early time response and low-frequency data, the complete electromagnetic response of dimensional conducting structure is generated. By mutually complementary data, simultaneous extrapolation in time and frequency domains are carried out. This is performed through the use of the associated Hermite polynomials. The interesting property of the Hermite polynomials is that they are the eigenfunctions of the Fourier transform operator. This implies that if the time-domain response at a point in space from a three-dimensional conducting object is modeled by an associated Hermite series expansion, the frequency-domain response at the same point can be expressed as a scaled version of the same time-domain representation. Therefore using early time and low-frequency-domain response data, it is possible to reproduce the missing response in both of the domains. Examples are presented to illustrate the application of this methodology.

❑ Return to main document.