Abstracts

A Frequency-Dependent Finite-Difference Time-Domain Formulation for General Dispersive Media (Reply to Comments)

O.P. Gandhi. "A Frequency-Dependent Finite-Difference Time-Domain Formulation for General Dispersive Media (Reply to Comments)." 1994 Transactions on Microwave Theory and Techniques 42.2 (Feb. 1994 [T-MTT]): 359-360.

I am distressed to read the letter by Allen Taflove raising "potential ethical questions" regarding our paper published in the IEEE Transactions on MTT. It did not occur to Taflove that we could have, and indeed have, developed this procedure of expressing D(t) in terms of E(t) in terms of a differential equation involving D, E, and their time derivatives independently, and that we were unaware of his work until very recently. We had been working on the coupling of NEMP to the human body, and were naturally interested in extending the scheme to ultrawide-band pulses where the dispersion of the tissues cannot be ignored. The approach described in our recent paper for general dispersive media was first described by me in a preproposal dated July 10, 1989, to Drs. Richard Albanese and Arje Nachman of the U.S. Air Force. Furthermore, I discussed this approach with colleagues such as David Whalen of Hughes Aircraft Company when I spent several weeks in their laboratory in January 1991 as part of my sabbatical leave. I also presented a guest lecture on it in April 1991 in a class, EE 752, Scattering and Diffraction of Electromagnetic Waves, being taught by my colleague, Prof. J. Mark Baird, at the University of Utah. All of this happened before the submission date of May 29, 1991 of the letter in question by Joseph, Hagness, and Taflove in which they describe the approach for a one-dimensional problem with claims that the procedure may also be usable for two-dimensional and three-dimensional problems.

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