

Meeting: 1005, Newark, Delaware, SS 3A, Special Session on Mathematical Methods in Electromagnetic Wave Propagation

1005-78-87 **Peter G. Petropoulos*** (peterp@ouzo.njit.edu), Department of Mathematical Sciences, New Jersey Institute of Technology, University Heights, Newark, NJ 07102. *Asymptotics and Numerics of Pulse Propagation in Dielectrics Exhibiting fractional Relaxation*. Preliminary report.

We will consider the propagation of time-domain electromagnetic pulses in biological media whose dielectric properties are described with the Cole-Cole model. The Cole-Cole dielectric model exhibits fractional time derivatives and is thus cumbersome to implement in standard time-domain CEM codes. I will present a procedure for computing fractional derivatives in the FD-TD method. Also, I will show short- and long-time asymptotic results for electromagnetic pulse propagating in Cole-Cole media. Comparisons with numerical experiments will be shown. (Received January 31, 2005)