Paper Review

Reviewer: Jun Liu
Paper Title: Piecewise linear recursive convolution for dispersive media using FDTD
Author: Kelley, D.F and Luebbers, R.J.
Linke:
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=509882&queryText=plrc%20fdtd&ranges=1996_1997_Year&searchField=Search_All

Summary:

Introduced a new method for computing dispersive media using finite difference time domain method by employing the recursive convolution approach to evaluate the discrete time convolution of the electric field and the dielectric susceptibility function. The RC approach results in a fast and computationally efficient algorithm; however, the accuracy achieved is not generally as good as that obtained with other methods. A new piecewise linear recursive convolution (PLRC) method is described here that has greatly improved accuracy over the original RC approach but retains its speed and efficiency advantages.

Main Contribution:

Used piecewise linear recursive convolution, realized accuracy and time trade off. The result was more accuracy than the previous RC method, yet the time complexity was the same.

Weak Points:

In the implementation, the time consumption was still larger than the previous RC method.

Technically Evaluating:

This method explained how the method work very well, it used math to prove its idea.

Organization and Presentation Evaluating:

The structure of the paper is highly readable and even the idea of the paper is a little tricky the authors explained their thought clearly.

Further improvement and application:

Time complexity can be further reduced and the accuracy of the method still has a

big gap to the theoretical accuracy.