COUPLED TM LINE TDFD ROUTING VS SMATH VERSION

Ans :=

for $a \in 1 .. Ncell$

  for $b \in 1 .. Nt$

    $AI_{a,b} \leftarrow 0$

    $VG_{a,b} \leftarrow 0$

  for $k \in 2 .. Nt - 1$

    for $j \in 1 .. Ncell$

      $\Delta I \leftarrow AI_{j,k-1}$ if $j \le 1$

      $\Delta I \leftarrow AI_{j,k-1} - AI_{j-1,k-1}$ otherwise

      $VG \leftarrow AI \cdot ZT_0$ if $j = 1$

      $VG \leftarrow AI \cdot ZT_{Ncell}$ if $j = Ncell$

      $$VG_{j,k} \leftarrow \frac{VG_{j,k-1} - \frac{\Delta I}{\Delta z} \cdot \frac{\Delta t_k}{CCg_k}}{1 + \frac{\Delta t_k}{CCg_k} \cdot Gg_k}$$ otherwise

      $VT \leftarrow VG$

    for $n \in 1 .. Ncell - 1$

      $\Delta V \leftarrow VT_{n+1,k} - VT_{n,k}$

      $$AI_{n,k} \leftarrow \frac{AI_{n,k-1} + \frac{\Delta t_k}{L_k} \cdot \left(EE_k - \frac{\Delta V}{\Delta z} \right)}{1 + \frac{\Delta t_k}{L_k} \cdot R_k}$$

      AI

  $stack(VT, AI)$

<----Must initialize inside program!

<----Time Loop on k

<----Spatial Loop on j for Voltage

{----Currents for previous time k-1

{----Voltage at End Point Terminations ZT

{----Voltage at Other Cable Points ≠ ZT

<----Spatial Loop on n for Current

<----Voltages for present time k

<----Current at point n and time k

$V := submatrix(Ans, 1, Ncell, 1, Nt - 1)$

$I := submatrix(Ans, Ncell, 2 \cdot Ncell, 1, Nt - 1)$