SIMPLE ABSORBING BOUNDARY CONDITION IN 1D (ABC)

ABC ARE NEEDED TO PREVENT OUTGOING E AND H FIELDS TO REFLECT BACK INTO THE PROBLEM SPACE. FOR OUR STABILITY CONDITIONS WE USED

\[ \Delta t = \frac{\Delta z}{2c_0} \]

IN VACUUM, WE CAN SEE THAT, IN TERMS OF DISTANCE,

\[ \text{DISTANCE} = \frac{\Delta z}{2} = c_0 \Delta t \]

THAT IS, TRAVELLING AT THE SPEED OF LIGHT, IN AN INTERVAL \( \Delta t \), OUR WAVEFRONT WILL PROPAGATE ACROSS \( \frac{1}{2} \) CELL. SO IT WILL TAKE 2 TIME INTERVALS TO PROPAGATE THROUGH ONE CELL.

SO WE CAN USE:

\[ E_x^n(k) = E_x^{n-2}(k+1) \]

AS A BOUNDARY CONDITION TO ABSORB A WAVE TRAVELLING TOWARDS THE LEFT, AND

\[ E_x^n(k+1) = E_x^{n-2}(k) \]

AS A BOUNDARY CONDITION TO ABSORB A WAVE TRAVELLING TOWARDS THE RIGHT.

SEE EXAMPLES

FDTDAABC.m