Numerical method for 1d fdtd simulation in plasma

Basic function:

Consider only one dimension along z axis, we have

Node and space distribution of E and H

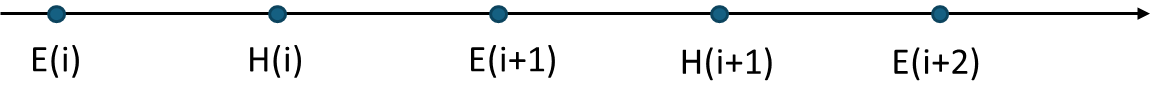
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Figure node i and space position of E and H

Reorganized the formula, we get

Where

Similarly ,as for Ex ,Ez,Hx and Hy,we have

For Ex

For Ez

For Hx

For Hy

Beside this ,we also need to solve the evolution of J. First of all, let’s discrete the J equation

Consider J(i) at the same space position of E(i), then we have

Replace the and simplify the equation, we have

Where

For the Absorb Boundary Condition

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