Differencing Faraday's Law

$$\frac{\partial \mathbf{B}}{\partial t} = -\nabla \times \mathbf{E}$$

$x = 0$

$E_y(i,j,k)$

$E_z(i,j-1,k)$ $E_z(i,j,k)$

$B_x(i,j,k)$

$E_y(i,j,k-1)$

z → y

$y = 0$

$E_x(i,j,k)$

$E_z(i-1,j,k)$ $E_z(i,j,k)$

$B_y(i,j,k)$

$E_x(i,j,k-1)$

z → x

$z = 0$

$E_x(i,j,k)$

$E_y(i-1,j,k)$ $E_y(i,j,k)$

$B_z(i,j,k)$

$E_x(i,j-1,k)$

y → x
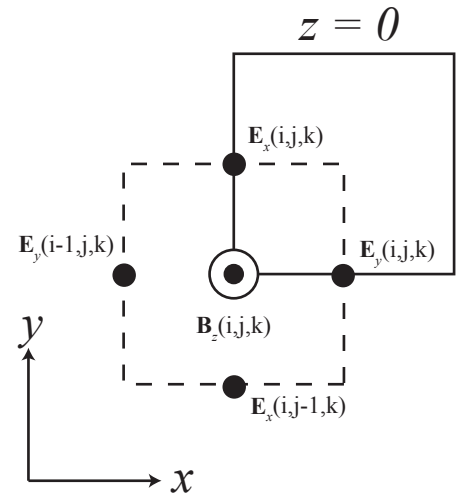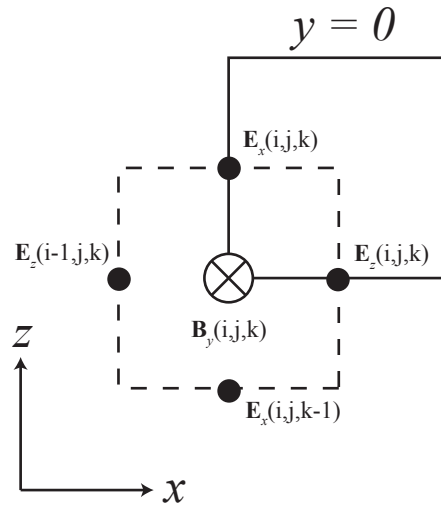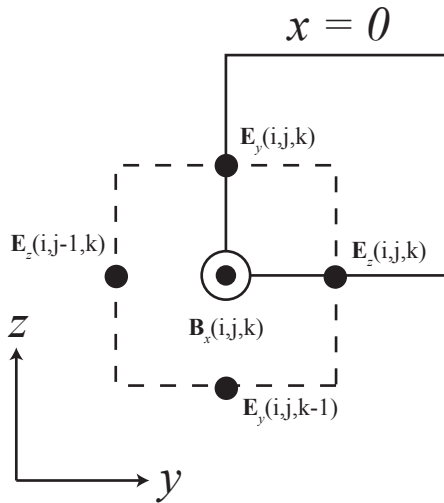
Differencing Ampere's Law

$$\frac{\partial \mathbf{E}}{\partial t} = \nabla \times \mathbf{B} - \mathbf{J}$$

$x = -1/2$

$B_y(i,j,k+1)$

$B_z(i,j,k)$ $B_z(i,j+1,k)$

$E_x(i,j,k)$

$B_y(i,j,k)$

z → y

$y = -1/2$

$B_x(i,j,k+1)$

$B_z(i,j,k)$ $B_z(i+1,j,k)$

$E_y(i,j,k)$

$B_x(i,j,k)$

z → x

$z = -1/2$

$B_x(i,j+1,k)$

$B_y(i,j,k)$ $B_y(i+1,j,k)$

$E_z(i,j,k)$

$B_x(i,j,k)$

y → x