!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! 電界に対する吸収境界条件

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

subroutine absorbing\_boundary\_condition\_for\_e

implicit none

!call mur\_1st\_for\_e ! Mur 1次の吸収境界条件

call mur\_2nd\_for\_e ! Mur 2次の吸収境界条件

return

end subroutine

!----------------------------------------------------------------------------

! Mur 1次の吸収境界条件

!----------------------------------------------------------------------------

subroutine mur\_1st\_for\_e

use consts

use fdtd

implicit none

integer :: i,j,k

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 i=1,nx に対して (x軸に沿って) \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ey に対して ----------------

do k=2,nz-1

do j=1,ny-1

ey(1,j,k) =eyx1(2,j,k)+cxd\*(ey(2,j,k)-eyx1(1,j,k))

ey(nx,j,k)=eyx1(3,j,k)+cxu\*(ey(nx-1,j,k)-eyx1(4,j,k))

end do

end do

! 過去の時間の値の更新

do k=2,nz-1

do j=1,ny-1

eyx1(1,j,k)=ey(1,j,k)

eyx1(2,j,k)=ey(2,j,k)

eyx1(3,j,k)=ey(nx-1,j,k)

eyx1(4,j,k)=ey(nx,j,k)

end do

end do

! ---------------- Ez に対して ----------------

do k=1,nz-1

do j=2,ny-1

ez(1,j,k) =ezx1(2,j,k)+cxd\*(ez(2,j,k)-ezx1(1,j,k))

ez(nx,j,k)=ezx1(3,j,k)+cxu\*(ez(nx-1,j,k)-ezx1(4,j,k))

end do

end do

! 過去の時間の値の更新

do k=1,nz-1

do j=2,ny-1

ezx1(1,j,k)=ez(1,j,k)

ezx1(2,j,k)=ez(2,j,k)

ezx1(3,j,k)=ez(nx-1,j,k)

ezx1(4,j,k)=ez(nx,j,k)

end do

end do

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 j=1,ny に対して (y軸に沿って) \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ex に対して ----------------

do k=2,nz-1

do i=1,nx-1

ex(i,1,k) =exy1(i,2,k)+cyd\*(ex(i,2,k)-exy1(i,1,k))

ex(i,ny,k)=exy1(i,3,k)+cyu\*(ex(i,ny-1,k)-exy1(i,4,k))

end do

end do

! 過去の時間の値の更新

do k=2,nz-1

do i=1,nx-1

exy1(i,1,k)=ex(i,1,k)

exy1(i,2,k)=ex(i,2,k)

exy1(i,3,k)=ex(i,ny-1,k)

exy1(i,4,k)=ex(i,ny,k)

end do

end do

! ---------------- Ez に対して ----------------

do k=1,nz-1

do i=2,nx-1

ez(i,1,k) =ezy1(i,2,k)+cyd\*(ez(i,2,k)-ezy1(i,1,k))

ez(i,ny,k)=ezy1(i,3,k)+cyu\*(ez(i,ny-1,k)-ezy1(i,4,k))

end do

end do

! 過去の時間の値の更新

do k=1,nz-1

do i=2,nx-1

ezy1(i,1,k)=ez(i,1,k)

ezy1(i,2,k)=ez(i,2,k)

ezy1(i,3,k)=ez(i,ny-1,k)

ezy1(i,4,k)=ez(i,ny,k)

end do

end do

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 k=1,nz に対して (z軸に沿って) \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ex に対して ----------------

do i=1,nx-1

do j=2,ny-1

ex(i,j,1) =exz1(i,j,2)+czd\*(ex(i,j,2)-exz1(i,j,1))

ex(i,j,nz)=exz1(i,j,3)+czu\*(ex(i,j,nz-1)-exz1(i,j,4))

end do

end do

! 過去の時間の値の更新

do i=1,nx-1

do j=2,ny-1

exz1(i,j,1)=ex(i,j,1)

exz1(i,j,2)=ex(i,j,2)

exz1(i,j,3)=ex(i,j,nz-1)

exz1(i,j,4)=ex(i,j,nz)

end do

end do

! ---------------- Ey に対して ----------------

do i=2,nx-1

do j=1,ny-1

ey(i,j,1) =eyz1(i,j,2)+czd\*(ey(i,j,2)-eyz1(i,j,1))

ey(i,j,nz)=eyz1(i,j,3)+czu\*(ey(i,j,nz-1)-eyz1(i,j,4))

end do

end do

! 過去の時間の値の更新

do i=2,nx-1

do j=1,ny-1

eyz1(i,j,1)=ey(i,j,1)

eyz1(i,j,2)=ey(i,j,2)

eyz1(i,j,3)=ey(i,j,nz-1)

eyz1(i,j,4)=ey(i,j,nz)

end do

end do

return

end subroutine

!----------------------------------------------------------------------------

! Mur 2次の吸収境界条件 (p.62)

!----------------------------------------------------------------------------

subroutine mur\_2nd\_for\_e

implicit none

!

! Mur の2次吸収境界条件 (p.65)

!

! ----------------

! z /| ④ /|

! / | (6) / |

! ---------------- |

! |(2)|y |(5)|

! | -----------|----

! | / (1) | /

! |/ ③ |/

! ---------------- x

!

! ○: 表の面, (\*): 隠れた面

! 1: z=0, x-y plane

! 2: x=0, y-z plane

! 3: y=0, x-z plane

! 4: z=z, x-y plane

! 5: x=x, y-z plane

! 6: y=y, x-z plane

!

call mur\_2nd\_yz\_plane\_for\_e ! y-z plane (2,5) 平面に対して

call mur\_2nd\_xz\_plane\_for\_e ! x-z plane (3,6) 平面に対して

call mur\_2nd\_xy\_plane\_for\_e ! x-y plane (1,4) 平面に対して

return

end subroutine

!----------------------------------------------------------------------------

! y-z 平面に対して(x軸方向に伝播)

!----------------------------------------------------------------------------

subroutine mur\_2nd\_yz\_plane\_for\_e

use consts

use fdtd

implicit none

integer :: i,j,k

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 i=1,nx に対して \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ey に対して ----------------

! １次吸収境界条件

! 紫

do k=2,nz-1

j=1

ey(1,j,k) =eyx1(2,j,k)+cyd\*(ey(2,j,k)-eyx1(1,j,k))

ey(nx,j,k)=eyx1(3,j,k)+cyu\*(ey(nx-1,j,k)-eyx1(4,j,k))

j=ny-1

ey(1,j,k) =eyx1(2,j,k)+cyd\*(ey(2,j,k)-eyx1(1,j,k))

ey(nx,j,k)=eyx1(3,j,k)+cyu\*(ey(nx-1,j,k)-eyx1(4,j,k))

end do

! 水色

do j=2,ny-2

k=2

ey(1,j,k) =eyx1(2,j,k)+cyd\*(ey(2,j,k)-eyx1(1,j,k))

ey(nx,j,k)=eyx1(3,j,k)+cyu\*(ey(nx-1,j,k)-eyx1(4,j,k))

k=nz-1

ey(1,j,k) =eyx1(2,j,k)+cyd\*(ey(2,j,k)-eyx1(1,j,k))

ey(nx,j,k)=eyx1(3,j,k)+cyu\*(ey(nx-1,j,k)-eyx1(4,j,k))

end do

! ２次吸収境界条件

! 緑

do k=3,nz-2

do j=2,ny-2

ey(1,j,k) =-eyx2(2,j,k)+cyd\*(ey(2,j,k)+eyx2(1,j,k)) &

+cyy\*(eyx1(1,j,k)+eyx1(2,j,k)) &

+cxfyd\*(eyx1(1,j+1,k)-2.0d0\*eyx1(1,j,k)+eyx1(1,j-1,k) &

+eyx1(2,j+1,k)-2.0d0\*eyx1(2,j,k)+eyx1(2,j-1,k)) &

+cxfzd\*(eyx1(1,j,k+1)-2.0d0\*eyx1(1,j,k)+eyx1(1,j,k-1) &

+eyx1(2,j,k+1)-2.0d0\*eyx1(2,j,k)+eyx1(2,j,k-1))

ey(nx,j,k)=-eyx2(3,j,k)+cyd\*(ey(nx-1,j,k)+eyx2(4,j,k)) &

+cyy\*(eyx1(4,j,k)+eyx1(3,j,k)) &

+cxfyd\*(eyx1(4,j+1,k)-2.0d0\*eyx1(4,j,k)+eyx1(4,j-1,k) &

+eyx1(3,j+1,k)-2.0d0\*eyx1(3,j,k)+eyx1(3,j-1,k)) &

+cxfzd\*(eyx1(4,j,k+1)-2.0d0\*eyx1(4,j,k)+eyx1(4,j,k-1) &

+eyx1(3,j,k+1)-2.0d0\*eyx1(3,j,k)+eyx1(3,j,k-1))

end do

end do

! 過去の時間の値の更新

do k=2,nz-1

do j=1,ny-1

eyx2(1,j,k)=eyx1(1,j,k)

eyx2(2,j,k)=eyx1(2,j,k)

eyx2(3,j,k)=eyx1(3,j,k)

eyx2(4,j,k)=eyx1(4,j,k)

eyx1(1,j,k)=ey(1,j,k)

eyx1(2,j,k)=ey(2,j,k)

eyx1(3,j,k)=ey(nx-1,j,k)

eyx1(4,j,k)=ey(nx,j,k)

end do

end do

! ---------------- Ez に対して ----------------

! １次吸収境界条件

! 紫

do k=1,nz-1

j=2

ez(1,j,k) =ezx1(2,j,k)+cxd\*(ez(2,j,k)-ezx1(1,j,k))

ez(nx,j,k)=ezx1(3,j,k)+cxu\*(ez(nx-1,j,k)-ezx1(4,j,k))

j=ny-1

ez(1,j,k) =ezx1(2,j,k)+cxd\*(ez(2,j,k)-ezx1(1,j,k))

ez(nx,j,k)=ezx1(3,j,k)+cxu\*(ez(nx-1,j,k)-ezx1(4,j,k))

end do

! 水色

do j=3,ny-2

k=1

ez(1,j,k) =ezx1(2,j,k)+cxd\*(ez(2,j,k)-ezx1(1,j,k))

ez(nx,j,k)=ezx1(3,j,k)+cxu\*(ez(nx-1,j,k)-ezx1(4,j,k))

k=nz-1

ez(1,j,k) =ezx1(2,j,k)+cxd\*(ez(2,j,k)-ezx1(1,j,k))

ez(nx,j,k)=ezx1(3,j,k)+cxu\*(ez(nx-1,j,k)-ezx1(4,j,k))

end do

! ２次吸収境界条件

! 緑

do k=2,nz-2

do j=3,ny-2

ez(1,j,k) =-ezx2(2,j,k)+cxd\*(ez(2,j,k)+ezx2(1,j,k)) &

+cxx\*(ezx1(1,j,k)+ezx1(2,j,k)) &

+cxfyd\*(ezx1(1,j+1,k)-2.0d0\*ezx1(1,j,k)+ezx1(1,j-1,k) &

+ezx1(2,j+1,k)-2.0d0\*ezx1(2,j,k)+ezx1(2,j-1,k)) &

+cxfzd\*(ezx1(1,j,k+1)-2.0d0\*ezx1(1,j,k)+ezx1(1,j,k-1) &

+ezx1(2,j,k+1)-2.0d0\*ezx1(2,j,k)+ezx1(2,j,k-1))

ez(nx,j,k)=-ezx2(3,j,k)+cxd\*(ez(nx-1,j,k)+ezx2(4,j,k)) &

+cxx\*(ezx1(4,j,k)+ezx1(3,j,k)) &

+cxfyd\*(ezx1(4,j+1,k)-2.0d0\*ezx1(4,j,k)+ezx1(4,j-1,k) &

+ezx1(3,j+1,k)-2.0d0\*ezx1(3,j,k)+ezx1(3,j-1,k)) &

+cxfzd\*(ezx1(4,j,k+1)-2.0d0\*ezx1(4,j,k)+ezx1(4,j,k-1) &

+ezx1(3,j,k+1)-2.0d0\*ezx1(3,j,k)+ezx1(3,j,k-1))

end do

end do

! 過去の時間の値の更新

do k=1,nz-1

do j=2,ny-1

ezx2(1,j,k)=ezx1(1,j,k)

ezx2(2,j,k)=ezx1(2,j,k)

ezx2(3,j,k)=ezx1(3,j,k)

ezx2(4,j,k)=ezx1(4,j,k)

ezx1(1,j,k)=ez(1,j,k)

ezx1(2,j,k)=ez(2,j,k)

ezx1(3,j,k)=ez(nx-1,j,k)

ezx1(4,j,k)=ez(nx,j,k)

end do

end do

return

end subroutine

!----------------------------------------------------------------------------

! x-z 平面に対して(y軸方向に伝播)

!----------------------------------------------------------------------------

subroutine mur\_2nd\_xz\_plane\_for\_e

use consts

use fdtd

implicit none

integer :: i,j,k

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 j=1,ny に対して \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ex に対して ----------------

! １次吸収境界条件

! 紫

do k=2,nz-1

i=1

ex(i,1,k) =exy1(i,2,k)+cyd\*(ex(i,2,k)-exy1(i,1,k))

ex(i,ny,k)=exy1(i,3,k)+cyu\*(ex(i,ny-1,k)-exy1(i,4,k))

i=nx-1

ex(i,1,k) =exy1(i,2,k)+cyd\*(ex(i,2,k)-exy1(i,1,k))

ex(i,ny,k)=exy1(i,3,k)+cyu\*(ex(i,ny-1,k)-exy1(i,4,k))

end do

! 水色

do i=2,nx-2

k=2

ex(i,1,k) =exy1(i,2,k)+cyd\*(ex(i,2,k)-exy1(i,1,k))

ex(i,ny,k)=exy1(i,3,k)+cyu\*(ex(i,ny-1,k)-exy1(i,4,k))

k=nz-1

ex(i,1,k) =exy1(i,2,k)+cyd\*(ex(i,2,k)-exy1(i,1,k))

ex(i,ny,k)=exy1(i,3,k)+cyu\*(ex(i,ny-1,k)-exy1(i,4,k))

end do

! ２次吸収境界条件

! 緑

do k=3,nz-2

do i=2,nx-2

ex(i,1,k) =-exy2(i,2,k)+cyd\*(ex(i,2,k)+exy2(i,1,k)) &

+cyy\*(exy1(i,1,k)+exy1(i,2,k)) &

+cyfxd\*(exy1(i+1,1,k)-2.0d0\*exy1(i,1,k)+exy1(i-1,1,k) &

+exy1(i+1,2,k)-2.0d0\*exy1(i,2,k)+exy1(i-1,2,k)) &

+cyfzd\*(exy1(i,1,k+1)-2.0d0\*exy1(i,1,k)+exy1(i,1,k-1) &

+exy1(i,2,k+1)-2.0d0\*exy1(i,2,k)+exy1(i,2,k-1))

ex(i,ny,k)=-exy2(i,3,k)+cyd\*(ex(i,ny-1,k)+exy2(i,4,k)) &

+cyy\*(exy1(i,4,k)+exy1(i,3,k)) &

+cyfxd\*(exy1(i+1,4,k)-2.0d0\*exy1(i,4,k)+exy1(i-1,4,k) &

+exy1(i+1,3,k)-2.0d0\*exy1(i,3,k)+exy1(i-1,3,k)) &

+cyfzd\*(exy1(i,4,k+1)-2.0d0\*exy1(i,4,k)+exy1(i,4,k-1) &

+exy1(i,3,k+1)-2.0d0\*exy1(i,3,k)+exy1(i,3,k-1))

end do

end do

! 過去の時間の値の更新

do k=2,nz-1

do i=1,nx-1

exy2(i,1,k)=exy1(i,1,k)

exy2(i,2,k)=exy1(i,2,k)

exy2(i,3,k)=exy1(i,3,k)

exy2(i,4,k)=exy1(i,4,k)

exy1(i,1,k)=ex(i,1,k)

exy1(i,2,k)=ex(i,2,k)

exy1(i,3,k)=ex(i,ny-1,k)

exy1(i,4,k)=ex(i,ny,k)

end do

end do

! ---------------- Ez に対して ----------------

! １次吸収境界条件

! 紫

do k=1,nz-1

i=2

ez(i,1,k) =ezy1(i,2,k)+cyd\*(ez(i,2,k)-ezy1(i,1,k))

ez(i,ny,k)=ezy1(i,3,k)+cyu\*(ez(i,ny-1,k)-ezy1(i,4,k))

i=nx-1

ez(i,1,k) =ezy1(i,2,k)+cyd\*(ez(i,2,k)-ezy1(i,1,k))

ez(i,ny,k)=ezy1(i,3,k)+cyu\*(ez(i,ny-1,k)-ezy1(i,4,k))

end do

! 水色

do i=3,nx-2

k=1

ez(i,1,k) =ezy1(i,2,k)+cyd\*(ez(i,2,k)-ezy1(i,1,k))

ez(i,ny,k)=ezy1(i,3,k)+cyu\*(ez(i,ny-1,k)-ezy1(i,4,k))

k=nz-1

ez(i,1,k) =ezy1(i,2,k)+cyd\*(ez(i,2,k)-ezy1(i,1,k))

ez(i,ny,k)=ezy1(i,3,k)+cyu\*(ez(i,ny-1,k)-ezy1(i,4,k))

end do

! ２次吸収境界条件

! 緑

do k=2,nz-2

do i=3,nx-2

ez(i,1,k) =-ezy2(i,2,k)+cyd\*(ez(i,2,k)+ezy2(i,1,k)) &

+cyy\*(ezy1(i,1,k)+ezy1(i,2,k)) &

+cyfxd\*(ezy1(i+1,1,k)-2.0d0\*ezy1(i,1,k)+ezy1(i-1,1,k) &

+ezy1(i+1,2,k)-2.0d0\*ezy1(i,2,k)+ezy1(i-1,2,k)) &

+cyfzd\*(ezy1(i,1,k+1)-2.0d0\*ezy1(i,1,k)+ezy1(i,1,k-1) &

+ezy1(i,2,k+1)-2.0d0\*ezy1(i,2,k)+ezy1(i,2,k-1))

ez(i,ny,k)=-ezy2(i,3,k)+cyd\*(ez(i,ny-1,k)+ezy2(i,4,k)) &

+cyy\*(ezy1(i,4,k)+ezy1(i,3,k)) &

+cyfxd\*(ezy1(i+1,4,k)-2.0d0\*ezy1(i,4,k)+ezy1(i-1,4,k) &

+ezy1(i+1,3,k)-2.0d0\*ezy1(i,3,k)+ezy1(i-1,3,k)) &

+cyfzd\*(ezy1(i,4,k+1)-2.0d0\*ezy1(i,4,k)+ezy1(i,4,k-1) &

+ezy1(i,3,k+1)-2.0d0\*ezy1(i,3,k)+ezy1(i,3,k-1))

end do

end do

! 過去の時間の値の更新

do k=1,nz-1

do i=2,nx-1

ezy2(i,1,k)=ezy1(i,1,k)

ezy2(i,2,k)=ezy1(i,2,k)

ezy2(i,3,k)=ezy1(i,3,k)

ezy2(i,4,k)=ezy1(i,4,k)

ezy1(i,1,k)=ez(i,1,k)

ezy1(i,2,k)=ez(i,2,k)

ezy1(i,3,k)=ez(i,ny-1,k)

ezy1(i,4,k)=ez(i,ny,k)

end do

end do

return

end subroutine

!----------------------------------------------------------------------------

! x-y 平面に対して(z軸方向に伝播)

!----------------------------------------------------------------------------

subroutine mur\_2nd\_xy\_plane\_for\_e

use consts

use fdtd

implicit none

integer :: i,j,k

! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 壁 k=1,nz に対して \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

! ---------------- Ex に対して ----------------

! １次吸収境界条件

! 紫

do j=2,ny-1

i=1

ex(i,j,1) =exz1(i,j,2)+czd\*(ex(i,j,2)-exz1(i,j,1))

ex(i,j,nz)=exz1(i,j,3)+czu\*(ex(i,j,nz-1)-exz1(i,j,4))

i=nx-1

ex(i,j,1) =exz1(i,j,2)+czd\*(ex(i,j,2)-exz1(i,j,1))

ex(i,j,nz)=exz1(i,j,3)+czu\*(ex(i,j,nz-1)-exz1(i,j,4))

end do

! 水色

do i=2,nx-2

j=2

ex(i,j,1) =exz1(i,j,2)+czd\*(ex(i,j,2)-exz1(i,j,1))

ex(i,j,nz)=exz1(i,j,3)+czu\*(ex(i,j,nz-1)-exz1(i,j,4))

j=ny-1

ex(i,j,1) =exz1(i,j,2)+czd\*(ex(i,j,2)-exz1(i,j,1))

ex(i,j,nz)=exz1(i,j,3)+czu\*(ex(i,j,nz-1)-exz1(i,j,4))

end do

! ２次吸収境界条件

! 緑

do i=2,nx-2

do j=3,ny-2

ex(i,j,1) =-exz2(i,j,2)+czd\*(ex(i,j,2)+exz2(i,j,1)) &

+czz\*(exz1(i,j,1)+exz1(i,j,2)) &

+czfxd\*(exz1(i+1,j,1)-2.0d0\*exz1(i,j,1)+exz1(i-1,j,1) &

+exz1(i+1,j,2)-2.0d0\*exz1(i,j,2)+exz1(i-1,j,2)) &

+czfyd\*(exz1(i,j+1,1)-2.0d0\*exz1(i,j,1)+exz1(i,j-1,1) &

+exz1(i,j+1,2)-2.0d0\*exz1(i,j,2)+exz1(i,j-1,2))

ex(i,j,nz)=-exz2(i,j,3)+czd\*(ex(i,j,nz-1)+exz2(i,j,4)) &

+czz\*(exz1(i,j,4)+exz1(i,j,3)) &

+czfxd\*(exz1(i+1,j,4)-2.0d0\*exz1(i,j,4)+exz1(i-1,j,4) &

+exz1(i+1,j,3)-2.0d0\*exz1(i,j,3)+exz1(i-1,j,3)) &

+czfyd\*(exz1(i,j+1,4)-2.0d0\*exz1(i,j,4)+exz1(i,j-1,4) &

+exz1(i,j+1,3)-2.0d0\*exz1(i,j,3)+exz1(i,j-1,3))

end do

end do

! 過去の時間の値の更新

do i=1,nx-1

do j=2,ny-1

exz2(i,j,1)=exz1(i,j,1)

exz2(i,j,2)=exz1(i,j,2)

exz2(i,j,3)=exz1(i,j,3)

exz2(i,j,4)=exz1(i,j,4)

exz1(i,j,1)=ex(i,j,1)

exz1(i,j,2)=ex(i,j,2)

exz1(i,j,3)=ex(i,j,nz-1)

exz1(i,j,4)=ex(i,j,nz)

end do

end do

! ---------------- Ey に対して ----------------

! １次吸収境界条件

! 紫

do j=1,ny-1

i=2

ey(i,j,1) =eyz1(i,j,2)+czd\*(ey(i,j,2)-eyz1(i,j,1))

ey(i,j,nz)=eyz1(i,j,3)+czu\*(ey(i,j,nz-1)-eyz1(i,j,4))

i=nx-1

ey(i,j,1) =eyz1(i,j,2)+czd\*(ey(i,j,2)-eyz1(i,j,1))

ey(i,j,nz)=eyz1(i,j,3)+czu\*(ey(i,j,nz-1)-eyz1(i,j,4))

end do

! 水色

do i=3,nx-2

j=1

ey(i,j,1) =eyz1(i,j,2)+czd\*(ey(i,j,2)-eyz1(i,j,1))

ey(i,j,nz)=eyz1(i,j,3)+czu\*(ey(i,j,nz-1)-eyz1(i,j,4))

j=ny-1

ey(i,j,1) =eyz1(i,j,2)+czd\*(ey(i,j,2)-eyz1(i,j,1))

ey(i,j,nz)=eyz1(i,j,3)+czu\*(ey(i,j,nz-1)-eyz1(i,j,4))

end do

! ２次吸収境界条件

! 緑

do i=3,nx-2

do j=2,ny-2

ey(i,j,1) =-eyz2(i,j,2)+czd\*(ey(i,j,2)+eyz2(i,j,1)) &

+czz\*(eyz1(i,j,1)+eyz1(i,j,2)) &

+czfxd\*(eyz1(i+1,j,1)-2.0d0\*eyz1(i,j,1)+eyz1(i-1,j,1) &

+eyz1(i+1,j,2)-2.0d0\*eyz1(i,j,2)+eyz1(i-1,j,2)) &

+czfyd\*(eyz1(i,j+1,1)-2.0d0\*eyz1(i,j,1)+eyz1(i,j-1,1) &

+eyz1(i,j+1,2)-2.0d0\*eyz1(i,j,2)+eyz1(i,j-1,2))

ey(i,j,nz)=-eyz2(i,j,3)+czd\*(ey(i,j,nz-1)+eyz2(i,j,4)) &

+czz\*(eyz1(i,j,4)+eyz1(i,j,3)) &

+czfxd\*(eyz1(i+1,j,4)-2.0d0\*eyz1(i,j,4)+eyz1(i-1,j,4) &

+eyz1(i+1,j,3)-2.0d0\*eyz1(i,j,3)+eyz1(i-1,j,3)) &

+czfyd\*(eyz1(i,j+1,4)-2.0d0\*eyz1(i,j,4)+eyz1(i,j-1,4) &

+eyz1(i,j+1,3)-2.0d0\*eyz1(i,j,3)+eyz1(i,j-1,3))

end do

end do

! 過去の時間の値の更新

do i=2,nx-1

do j=1,ny-1

eyz2(i,j,1)=eyz1(i,j,1)

eyz2(i,j,2)=eyz1(i,j,2)

eyz2(i,j,3)=eyz1(i,j,3)

eyz2(i,j,4)=eyz1(i,j,4)

eyz1(i,j,1)=ey(i,j,1)

eyz1(i,j,2)=ey(i,j,2)

eyz1(i,j,3)=ey(i,j,nz-1)

eyz1(i,j,4)=ey(i,j,nz)

end do

end do

return

end subroutine