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

! 電流源

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

subroutine ecur\_line\_source

use fdtd

implicit none

integer :: i,j,k,id

real(8) :: sin\_warming\_up

i=nx/2

j=ny/2

do k=2,nz-1

id=media\_id(i,j,k)

ez(i,j,k)=ez(i,j,k) &

-(dt/eps(id))/(1.0d0+(sig(id)\*dt)/(2.0d0\*eps(id)))\*sin\_warming\_up(time-dt/2.0d0)

end do

return

end subroutine

subroutine ecur\_infinitesimal\_dipole\_source

use fdtd

implicit none

integer :: i,j,k,id

real(8) :: sin\_warming\_up

i=nx/2

j=ny/2

k=nz/2

id=media\_id(i,j,k)

ez(i,j,k)=ez(i,j,k) &

-(dt/eps(id))/(1.0d0+(sig(id)\*dt)/(2.0d0\*eps(id)))\*sin\_warming\_up(time-dt/2.0d0)

return

end subroutine

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

! 平面波

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

subroutine plane\_wave\_source

use consts

use fdtd

implicit none

integer :: i,j,k

real(8) :: sin\_warming\_up

j=3

do k=1,nz-1

do i=1,nx-1

ez(i,j,k)=sin\_warming\_up(time-dt/2.0d0)

hx(i,j,k)=ez(i,j,k)/z0

end do

end do

return

end subroutine

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

! 波源の関数形

! だんだん振幅が大きくなる正弦波(p.48)

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

real(8) function sin\_warming\_up(t)

use consts

use fdtd

implicit none

real(8) :: t

real(8) :: tp,t1

tp=1.0d0/freq

t1=4.0d0\*tp

if(t < t1) then

! ウォーミングアップ

sin\_warming\_up=0.5d0\*(1.0d0-dcos(pi\*t/t1))\*dsin(2.0d0\*pi\*freq\*t)

else

! 正弦波

sin\_warming\_up=dsin(2.0d0\*pi\*freq\*t)

end if

end function