v1.2 Mar.2016

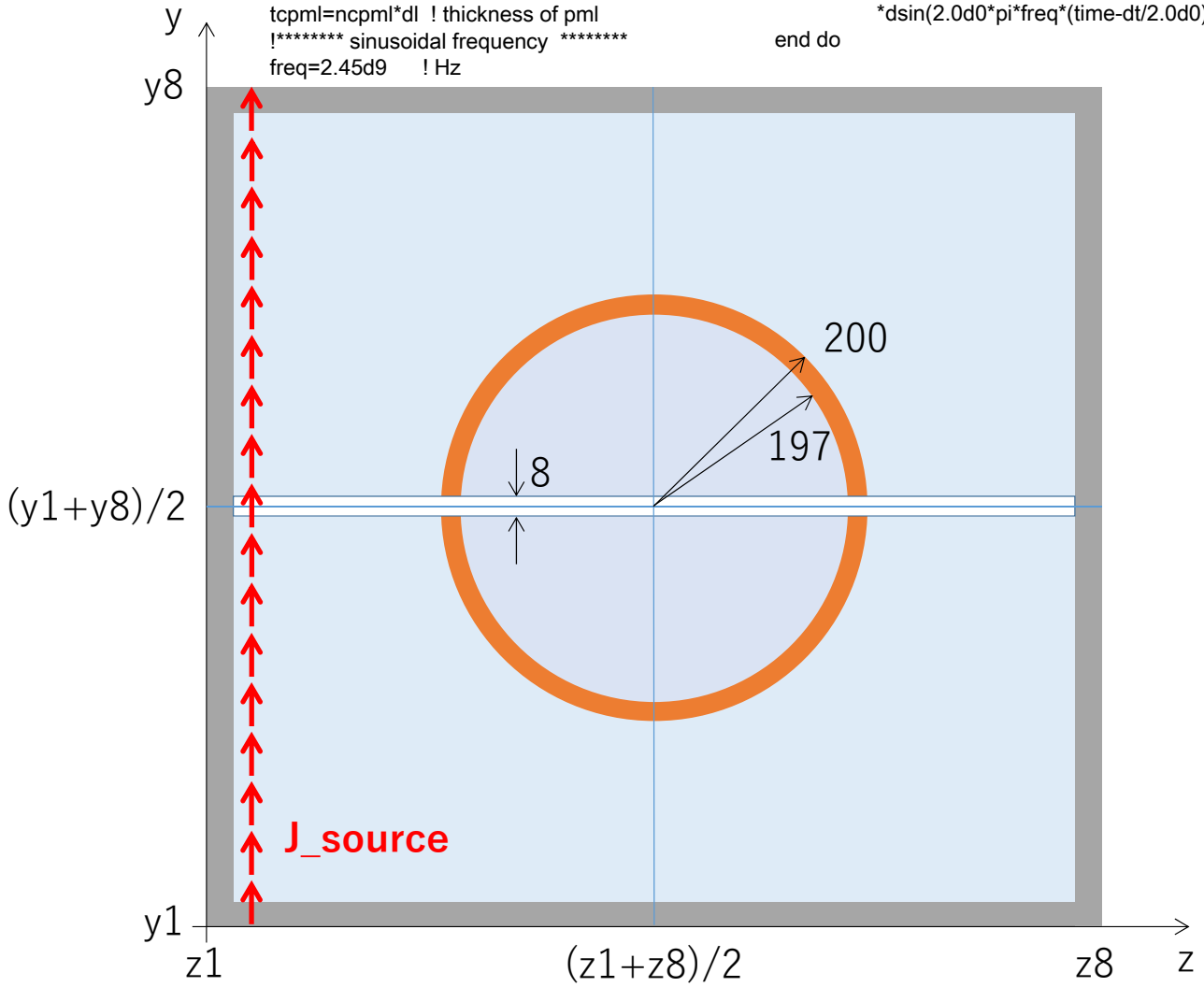
Sphere shielding
with center gap

subroutine lattice_time_2dtm

```
!******** lattice widths ********
dl=2.0d-3
dy=dl
dz=dl
!******** number of cells in pml (ncpml) ********
ncpml=8  ! number of cell in pml
tcpml=ncpml*dl  ! thickness of pml
!******** sinusoidal frequency  ********
freq=2.45d9      ! Hz
```

subroutine j_source_2dtm

```
 do j=yi(1),yi(8)-1   ! for z propagation
 k=zi(2)+2
      id=id_ey(j,k)
        ey(j,k)=ey(j,k) &
              -(dt/eps(id))/(1+(sig(id)*dt/(2.0d0*eps(id)))) &
              *(-2.0d0)/sqrt(mu0/eps0)/dz &         ! J [A/m2]
              *dsin(2.0d0*pi*freq*(time-dt/2.0d0))
end do
```



subroutine modeling_2dtm

```
  ! circular media
  jcent=nint((yi(1)+yi(8))/2.0)
  kcent=nint((zi(1)+zi(8))/2.0)
  radius=200.0d-3
  call circular_media

 ! rectangular media
  mys=nint((yi(1)+yi(8))/2.0)-2
  mye=nint((yi(1)+yi(8))/2.0)+2
  mzs=zi(1)
  mze=zi(8)
  call rectangular_media
```

subroutine circular_media

```
  do j=1,iy
    do k=1,iz-1
      radi=sqrt(((j-jcent)*dy)**2+((k-kcent)*dz)**2)
      if(radi <= radius .and. radi >= radius-3.0d-3) then
        id_ez(j,k)=1
      end if
    end do
  end do
  do j=1,iy-1
    do k=1,iz
      radi=sqrt(((j-jcent)*dy)**2+((k-kcent)*dz)**2)
      if(radi <= radius .and. radi >= radius-3.0d-3) then
        id_ey(j,k)=1
      end if
    end do
  end do
```

subroutine rectangular_media

```
 do j=mys,mye
    do k=mzs,mze-1
      id_ez(j,k)=0
    end do
 end do
 do j=mys,mye-1
    do k=mzs,mze
      id_ey(j,k)=0
    end do
 end do
```