

v1.2 Mar.2016
Dielectric lens

```

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

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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

```

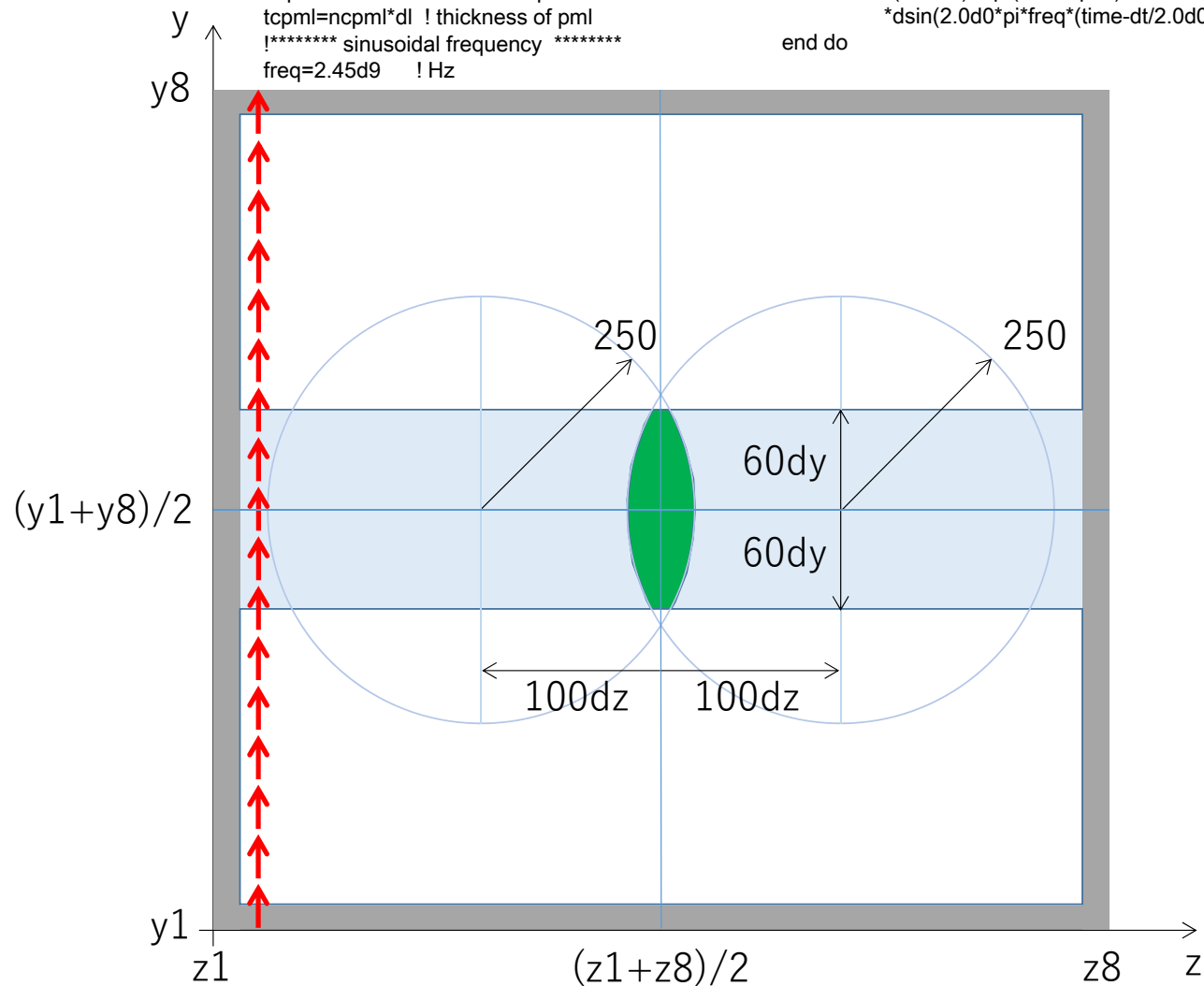
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subroutine media_coeff_2dtm
! id=0 vacume
eps(0)=eps0
sig(0)=0.0d0
mu(0)=mu0
! id=1 pec or pmc

! circular media 2
jcent1=nint((yi(1)+yi(8))/2.0)
kcent1=nint((zi(1)+zi(8))/2.0)+100
radius1=250.0d-3
jcent2=nint((yi(1)+yi(8))/2.0)
kcent2=nint((zi(1)+zi(8))/2.0)-100
radius2=250.0d-3
call lens_media
! rectangular media
mys=nint((yi(1)+yi(8))/2.0)+60
mye=yi(8)
mzs=zi(1)
mze=zi(8)
call rectangular_media
! rectangular media
mys=yi(1)
mye=nint((yi(1)+yi(8))/2.0)-60
mzs=zi(1)
mze=zi(8)
call rectangular_media

subroutine lens_media
do j=1,iy
do k=1,iz-1
radi1=sqrt(((j-jcent1)*dy)**2+((k-kcent1)*dz)**2)
radi2=sqrt(((j-jcent2)*dy)**2+((k-kcent2)*dz)**2)
if(radi1 <= radius1 .and. radi2 <= radius2) then
id_ez(j,k)=2
end if
end do
end do
do j=1,iy-1
do k=1,iz
radi1=sqrt(((j-jcent1)*dy)**2+((k-kcent1)*dz)**2)
radi2=sqrt(((j-jcent2)*dy)**2+((k-kcent2)*dz)**2)
if(radi1 <= radius1 .and. radi2 <= radius2) then
id_ey(j,k)=2
end if
end do
end do
end do

```



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Dielectric lens
with deficit

```

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 media_coeff_2dtm
! circular media 2
jcent1=nint((yi(1)+yi(8))/2.0)
kcent1=nint((zi(1)+zi(8))/2.0)+100
radius1=250.0d-3
jcent2=nint((yi(1)+yi(8))/2.0)
kcent2=nint((zi(1)+zi(8))/2.0)-100
radius2=250.0d-3
call lens_media
! rectangular media
mys=nint((yi(1)+yi(8))/2.0)+60
mye=yi(8)
mzs=zi(1)
mze=zi(8)
call rectangular_media
! rectangular media
mys=yi(1)
mye=nint((yi(1)+yi(8))/2.0)-60
mzs=zi(1)
mze=zi(8)
call rectangular_media

! circular media
jcent=nint((yi(1)+yi(8))/2.0)-15
kcent=nint((zi(1)+zi(8))/2.0)-30
radius=30.0d-3
call circular_media
! circular media
jcent=nint((yi(1)+yi(8))/2.0)+15
kcent=nint((zi(1)+zi(8))/2.0)-30
radius=30.0d-3
call circular_media
! circular media
jcent=nint((yi(1)+yi(8))/2.0)+35
kcent=nint((zi(1)+zi(8))/2.0)-28
radius=30.0d-3
call circular_media

```

