線源の設定

使用コード：13th_source.f

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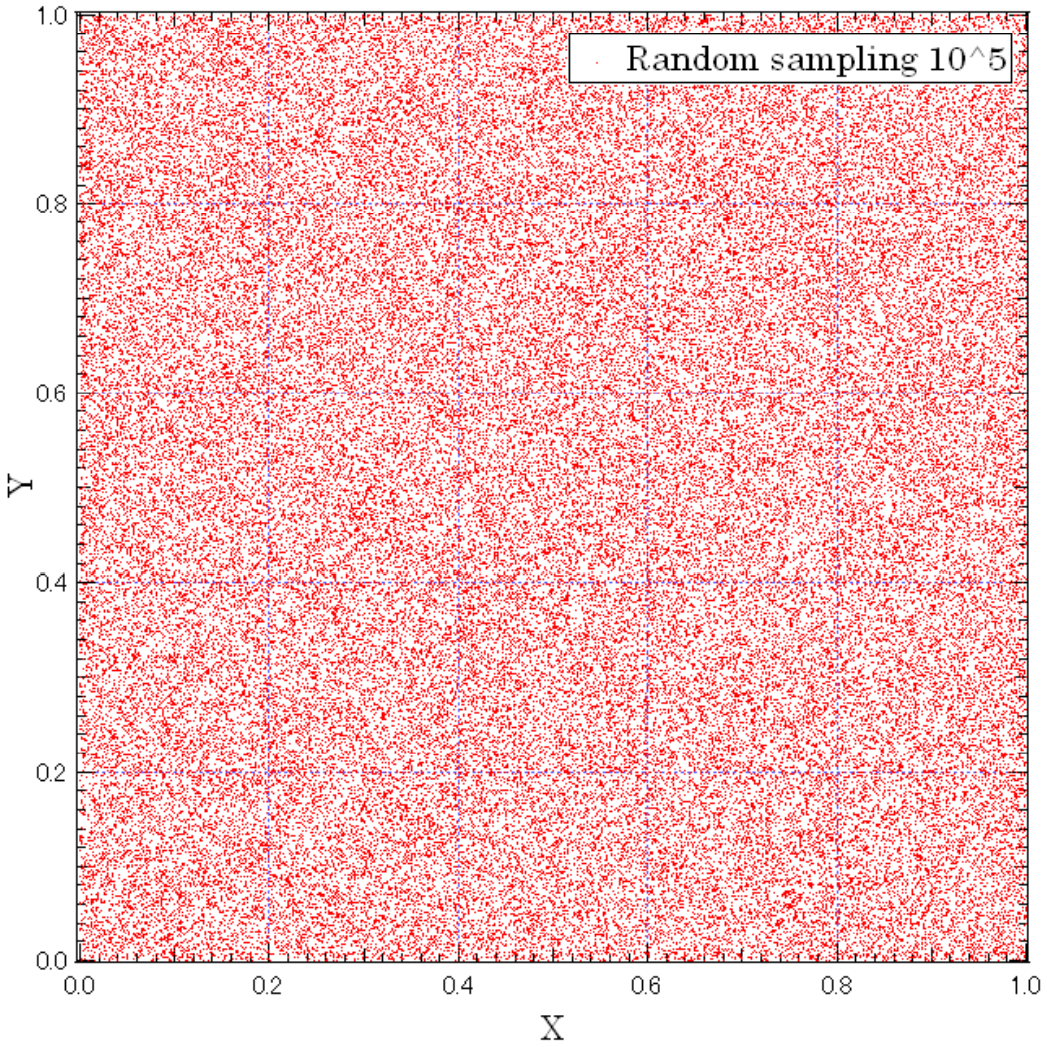
Random sampling(10^5 particles)

モンテカルロシミュレーションのウリは
乱数を使うこと！

乱数を用いる箇所は線源の設定が大部分！

Random sampling(10^5 particles)

X : 0~1
Y : 0~1



Source type

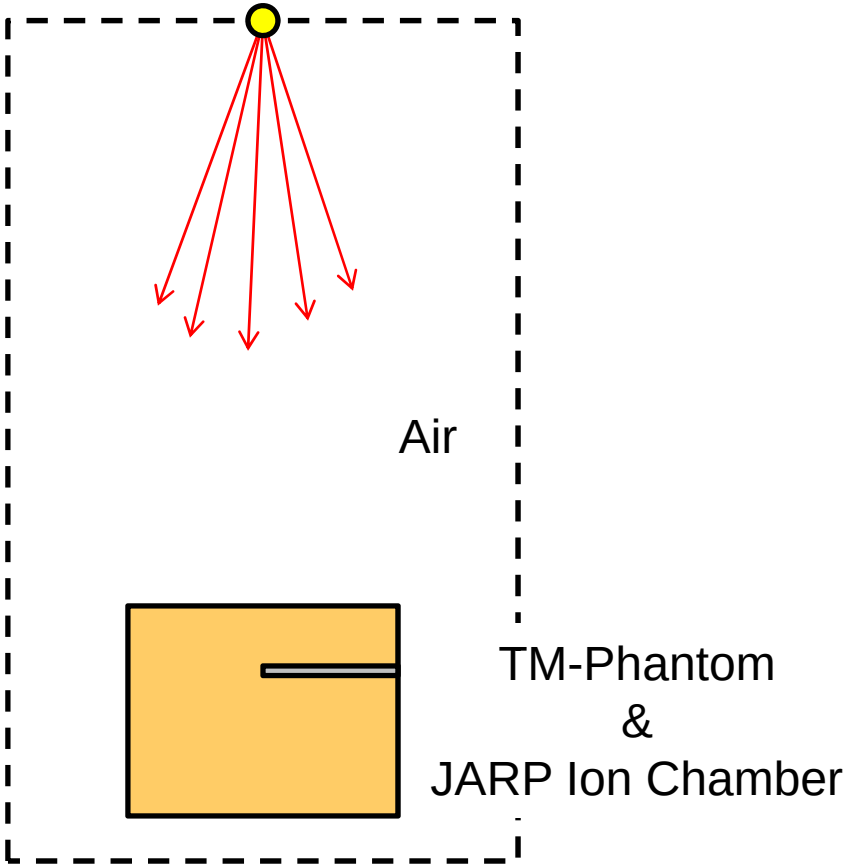
L:217

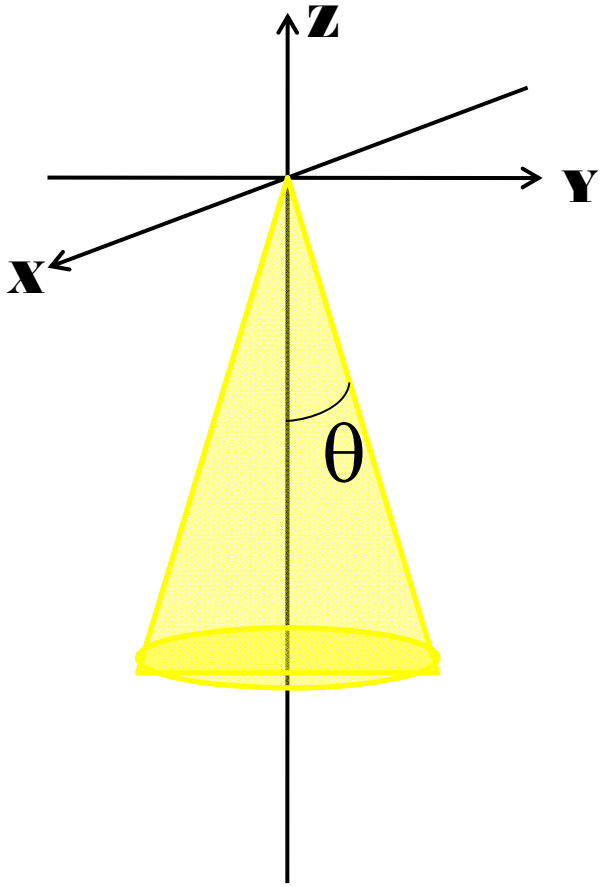
```
!=============================================================
! Add more beam source parameters by H.I
!=============================================================
      ist = 1         ! 1 : Point source
                      ! 2 : Area source
                      ! 3 : Cylinder source
                      ! 4 : Energy Spectrum
```

L:242

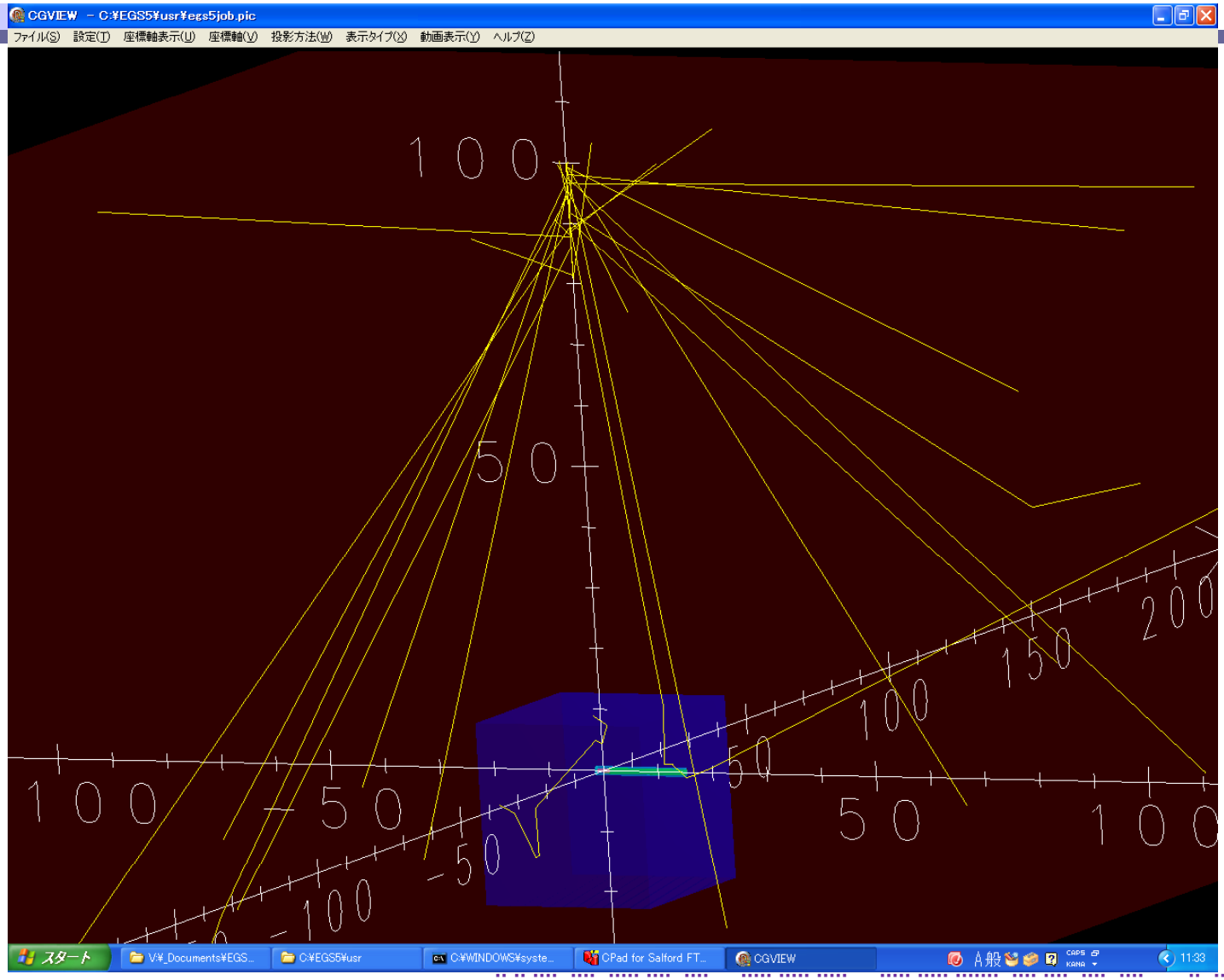
```
      srad  = 0.5       ! Define radius of Cylinder source
      sleng = 5.0       ! Define length of Cylinder source
      angle = 60.0      ! Define cone angle of beam
      phi   = 45.0      ! Define direction of cone
      areax = 2.0       ! X length of Area source
      areay = 3.0       ! Y length of Area source
```

Source type 1 – Point Source

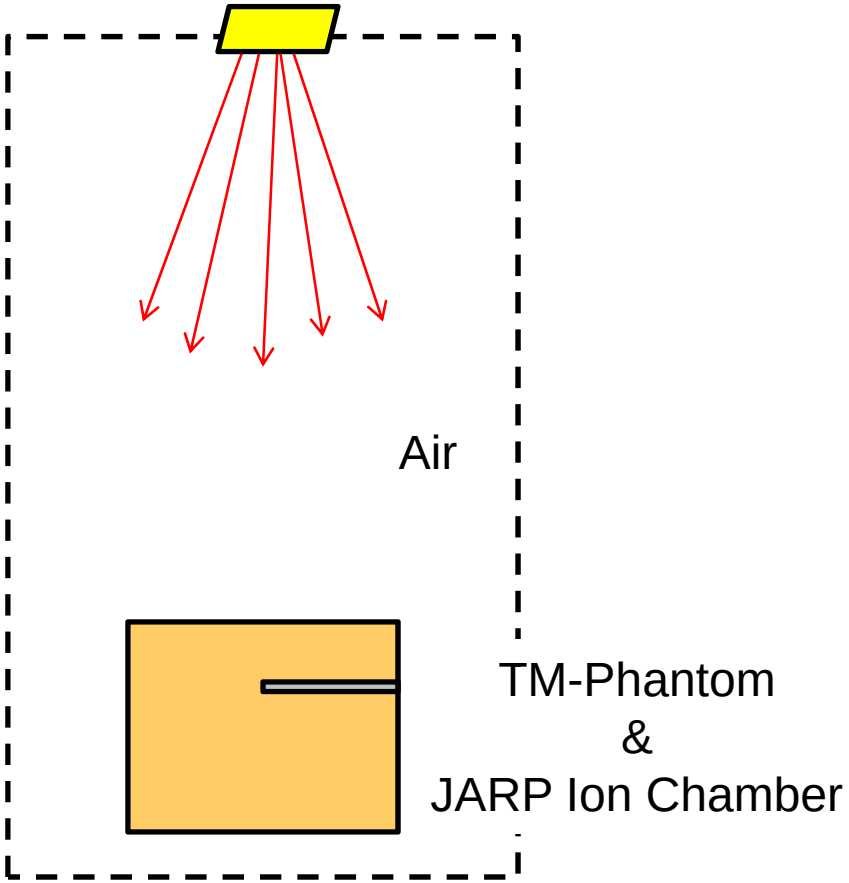


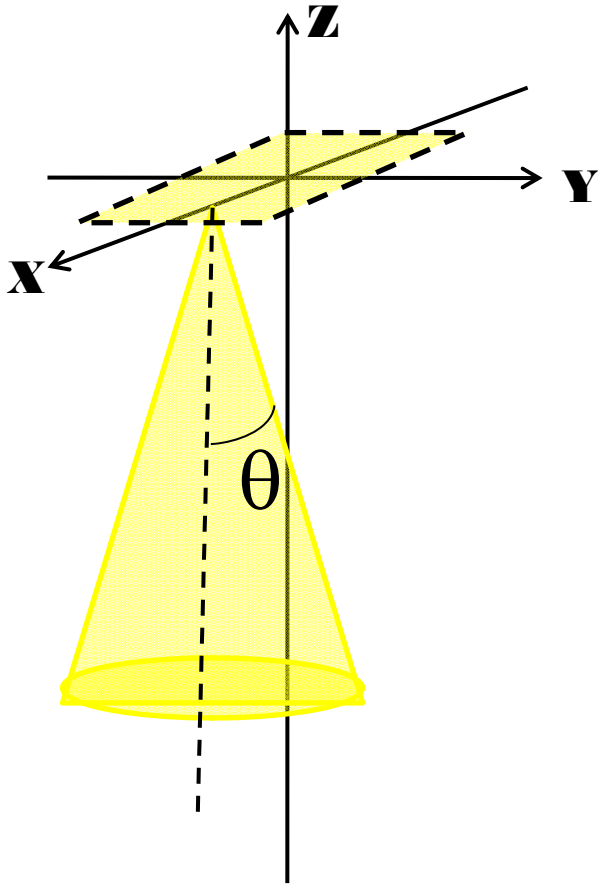


Source type 1 – Point Source

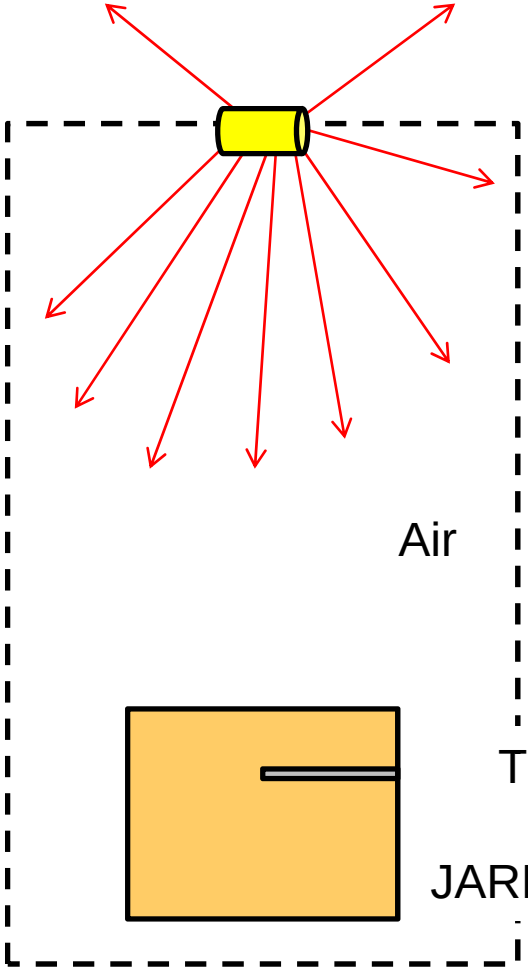


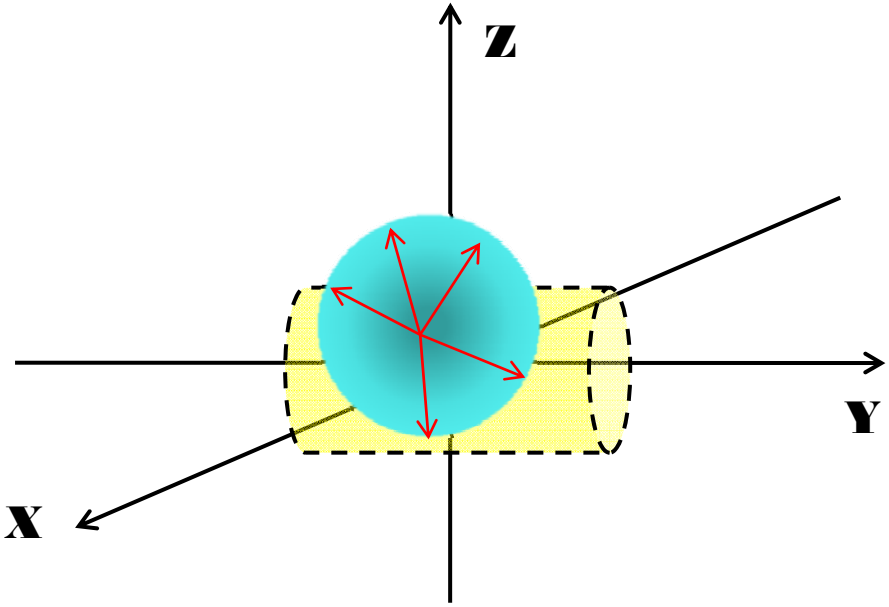
Source type 2 – Area Source





Source type 3 – Cylinder Source

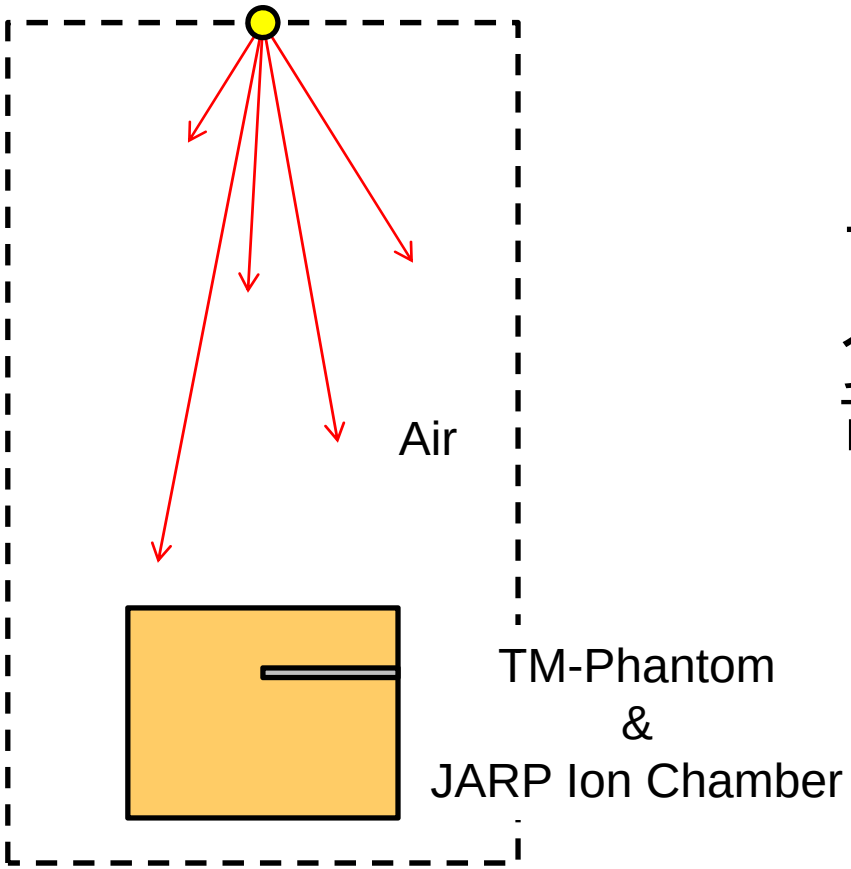




円筒内の位置から粒子が
等方的に放出

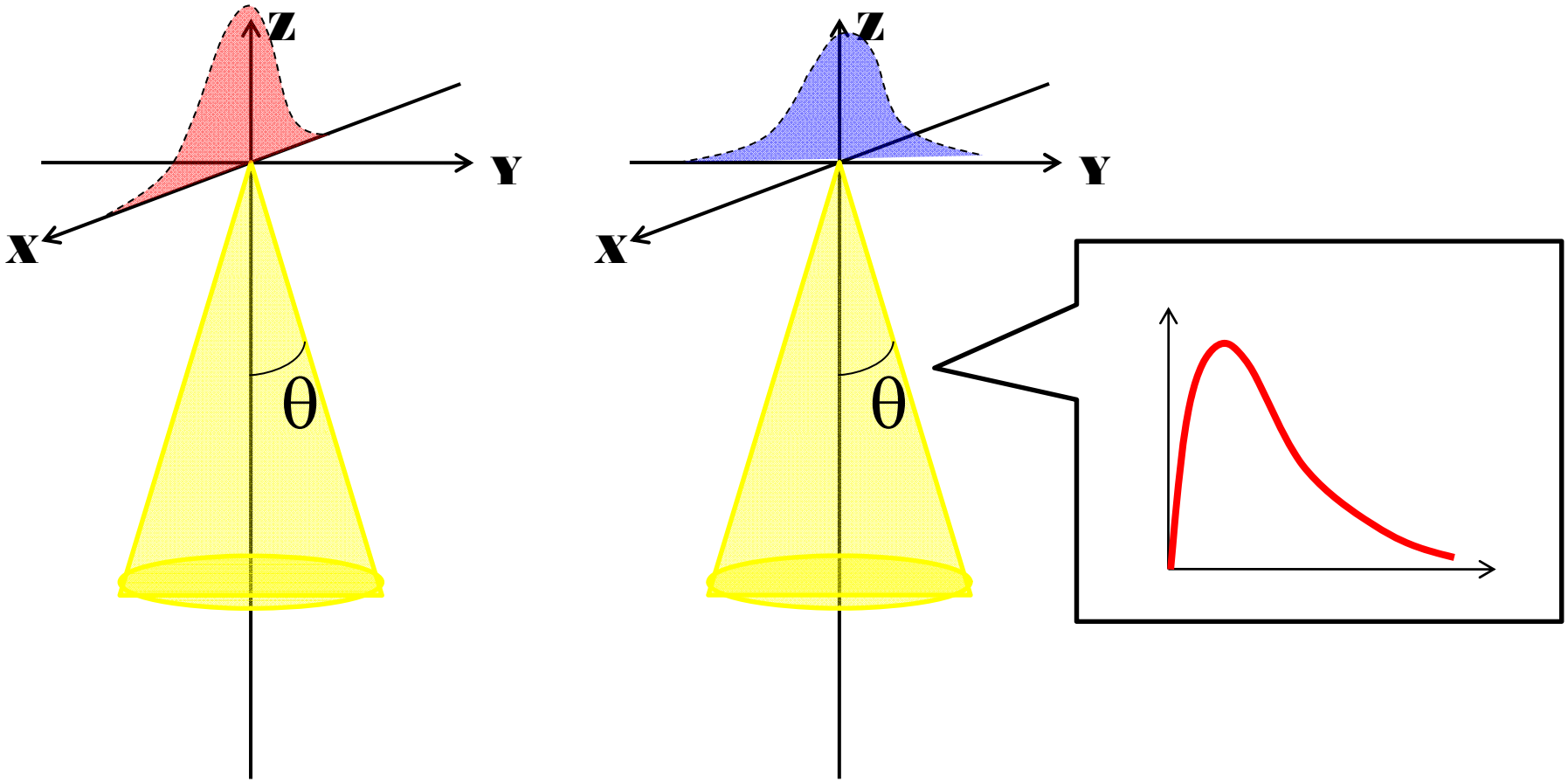
srad=0で線線源相当になる

Source type 4 – Energy Spectrum

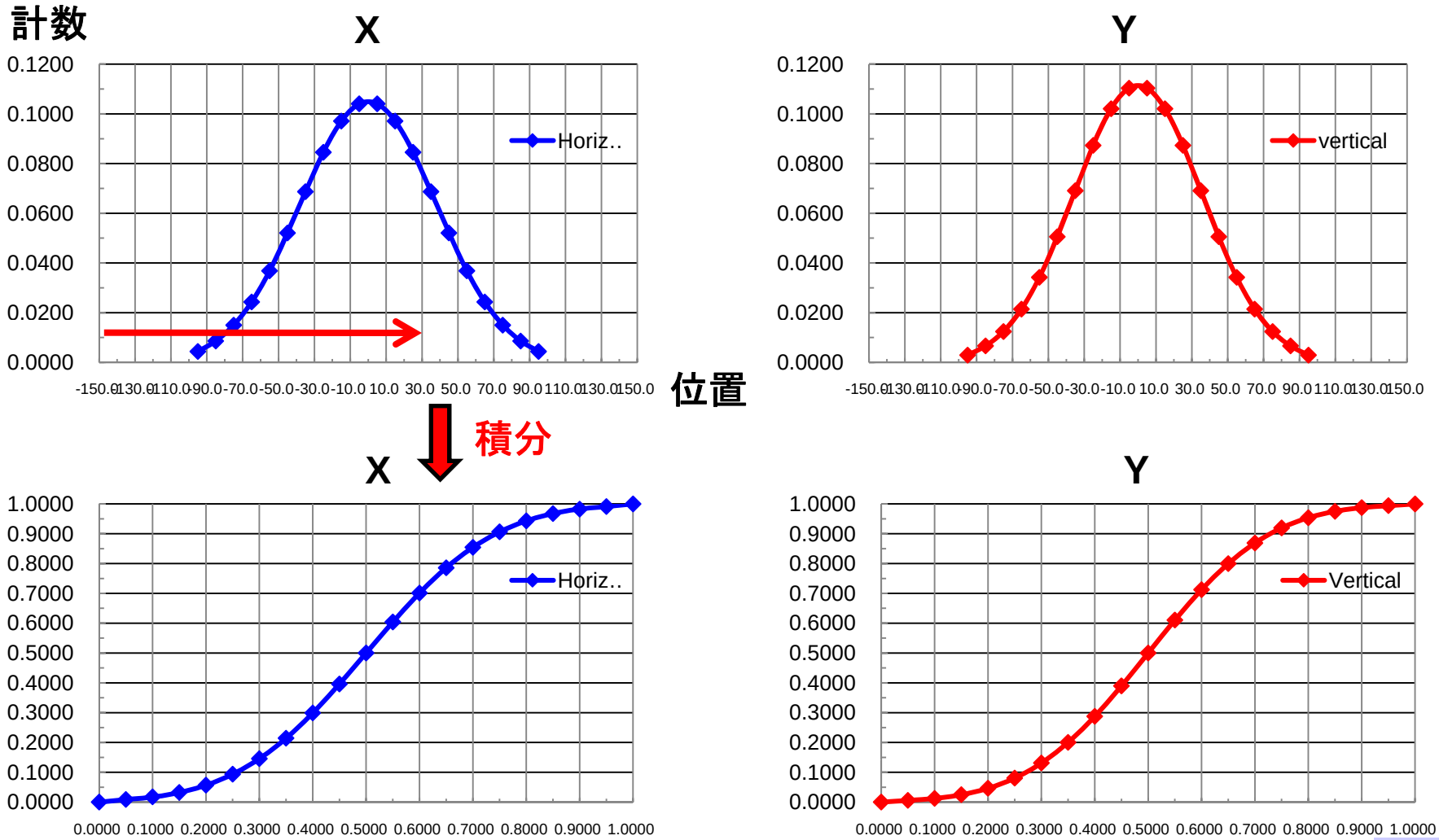


エネルギー分布、
入射粒子の座標情報を
乱数を用いて与える

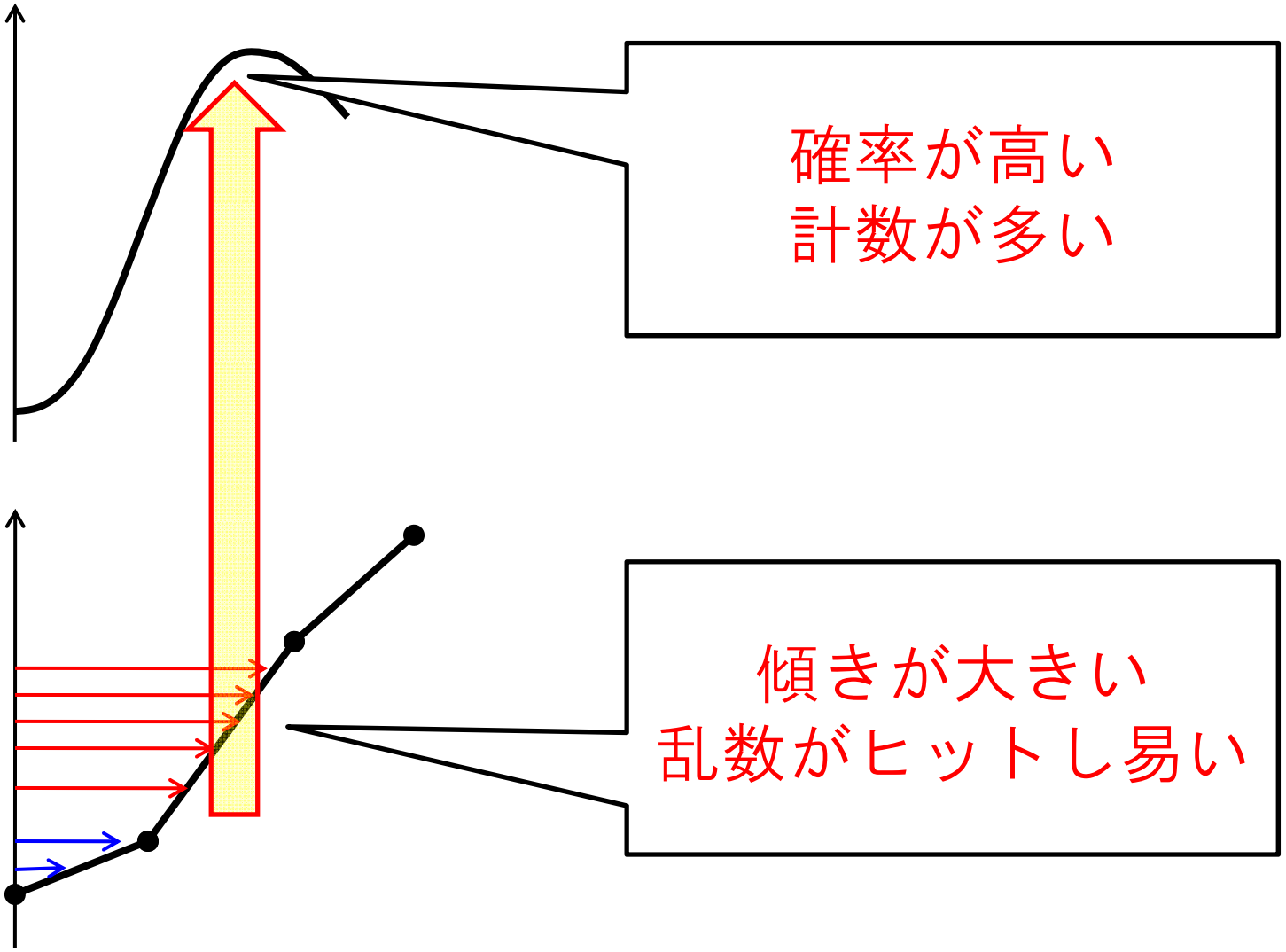
Source type 4 – Energy Spectrum



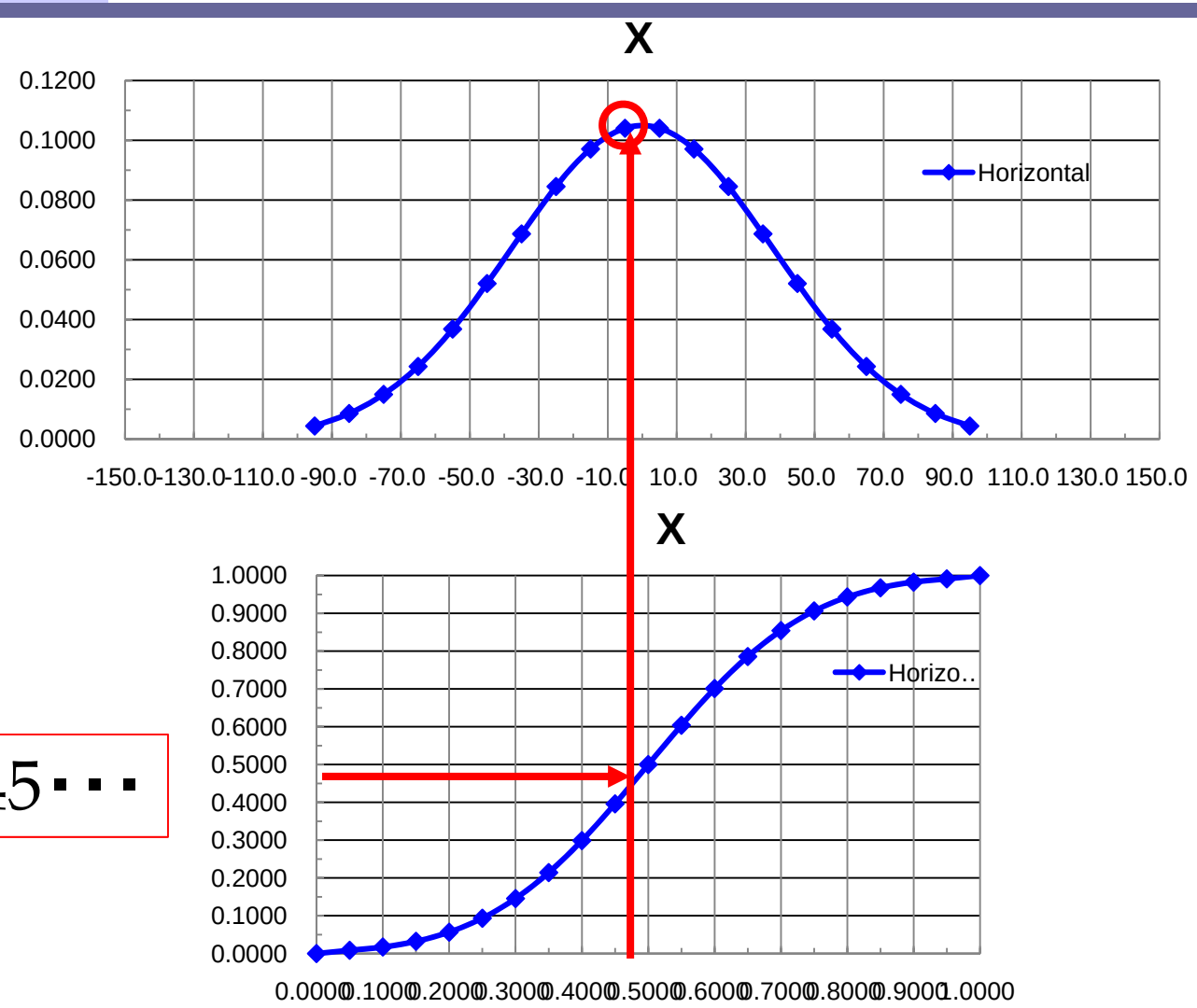
2D Gaussian


計数
X
0.1200
0.1000
0.0800
0.0600
0.0400
0.0200
0.0000
Horiz..
-150.0 -130.0 -110.0 -90.0 -70.0 -50.0 -30.0 -10.0 10.0 30.0 50.0 70.0 90.0 110.0 130.0 150.0
位置
Y
0.1200
0.1000
0.0800
0.0600
0.0400
0.0200
0.0000
vertical
-150.0 -130.0 -110.0 -90.0 -70.0 -50.0 -30.0 -10.0 10.0 30.0 50.0 70.0 90.0 110.0 130.0 150.0
積分
X
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
Horiz..
0.0000 0.1000 0.2000 0.3000 0.4000 0.5000 0.6000 0.7000 0.8000 0.9000 1.0000
Y
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
Vertical
0.0000 0.1000 0.2000 0.3000 0.4000 0.5000 0.6000 0.7000 0.8000 0.9000 1.0000

Probability Density Function



2D Gaussian



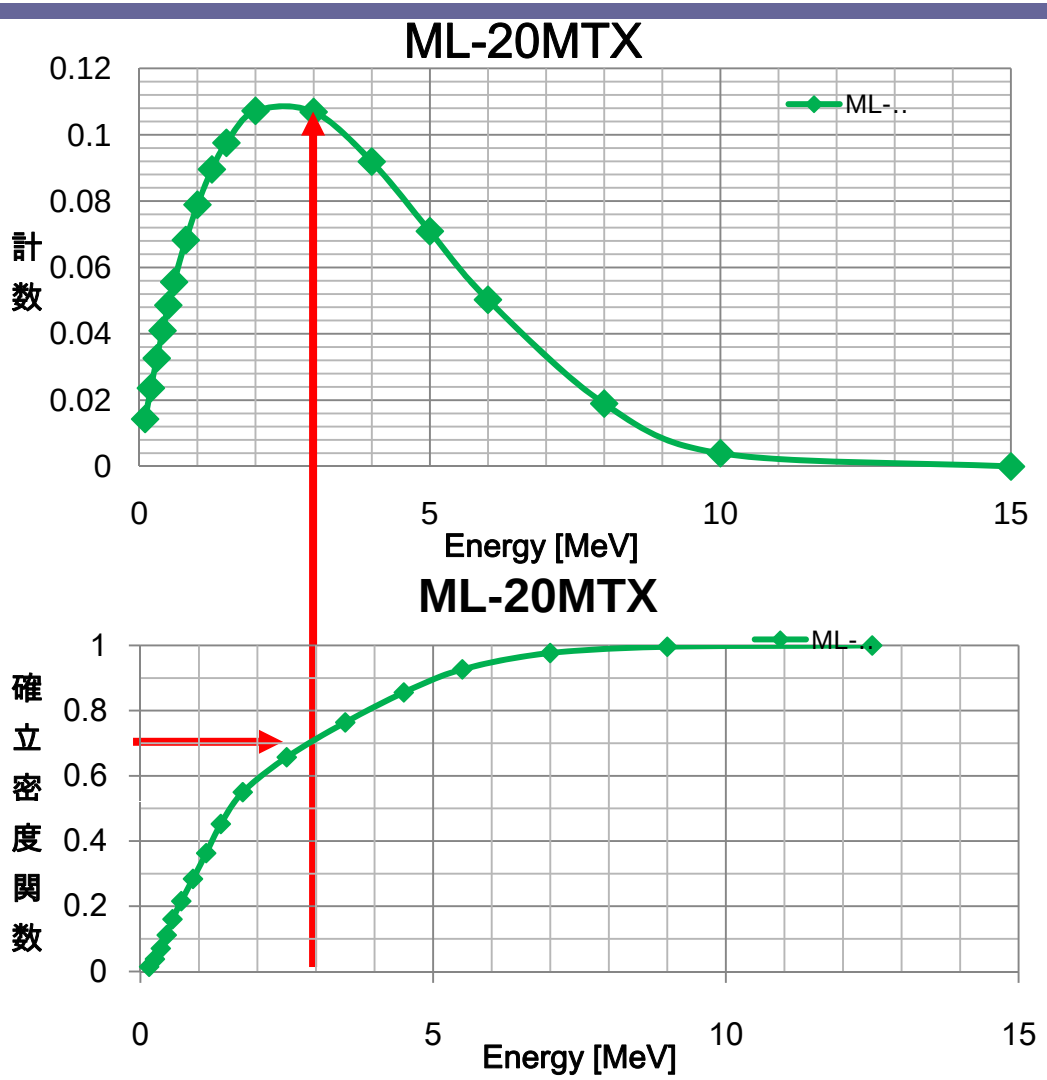
X : 0.45▪▪▪

2D Gaussian

L:257

```
!=================================================================
! Get Position parameters by H.I
!=================================================================
      open(40,file='13th_position.dat',status='old')
      read(40,*) nhorbin
      read(40,*) (horbin(ihor),ihor=1,nhorbin)
      read(40,*) (hprobin(ihor),ihor=1,nhorbin)
      read(40,*) nvertbin
      read(40,*) (vertbin(ivert),ivert=1,nvertbin)
      read(40,*) (vprobin(ivert),ivert=1,nvertbin)
      close(UNIT=40)
      write (0,*) 'Spectrum data are aqcuired !!'
      write (0,*) ''
```

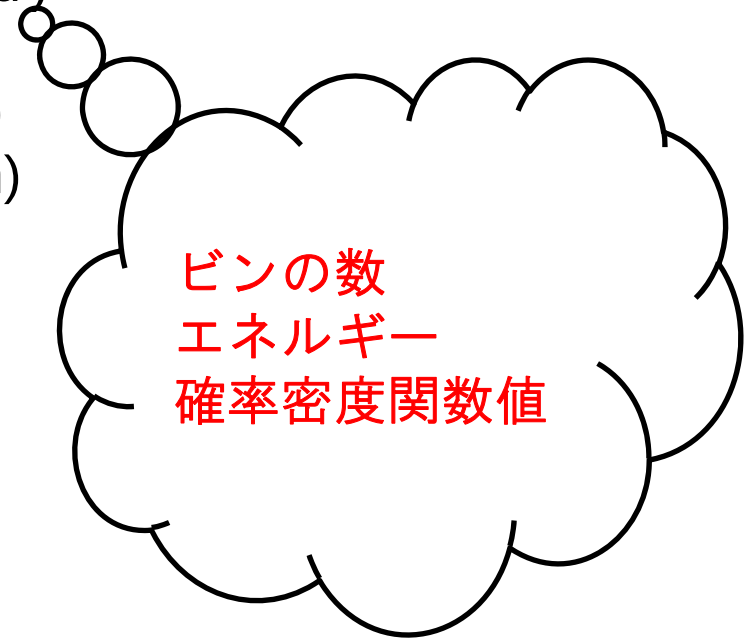
Energy Spectrum



Energy Spectrum

L:249

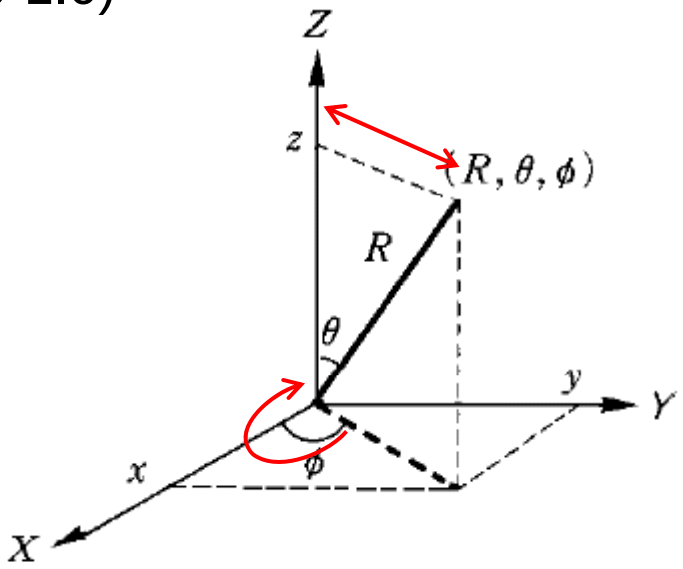
```
!=============================================================
! Get Energy Spectrum parameters by H.I
!=============================================================
      open(41,file='13th_energy.dat',status='old')
      read(41,*) nenebin
      read(41,*) (enebin(iene),iene=1,nenebin)
      read(41,*) (eprobin(iene),iene=1,nenebin)
      close(UNIT=41)
```



Energy Spectrum

L:504

```
!=====Energy spectrum===============
      if(ist.eq.4) then
       call randomset(rndmp)
        coneangle1=PI*(angle/180.0)*(2.0*rndmp-1.0)
        win=-cos(coneangle1)
       call randomset(rndmp2)
        coneangle2=PI*(2.0*rndmp2-1.0)
        uin=dsqrt(1-win*win)*cos(coneangle2)
        vin=dsqrt(1-win*win)*sin(coneangle2)
        zin=100.0
```



Energy Spectrum

L:513

```
call randomset(rndmp3)
      do nnn=1,nhorbin-1
        if (rndmp3.ge.hprobin(nnn).and.rndmp3.lt.hprobin(nnn+1)) then
          xin=horbin(nnn)
        end if
      end do
     call randomset(rndmp4)
      do nnn=1,nvertbin-1
        if (rndmp4.ge.vprobin(nnn).and.rndmp4.lt.vprobin(nnn+1)) then
          yin=vertbin(nnn)
        end if
      end do
     call randomset(rndme)
      do nnn=1,nenebin-1
        if (rndme.ge.eprobin(nnn).and.rndme.lt.eprobin(nnn+1)) then
          ekein=enebin(nnn)
        end if
      end do
```

Modification

✓スライド中に実際のユーザーコード未使用パラメータ“theta”が入っていた点を変更

✓円筒線源の計算形式を霜村代表指示により変更