Fred: emittance model and regions

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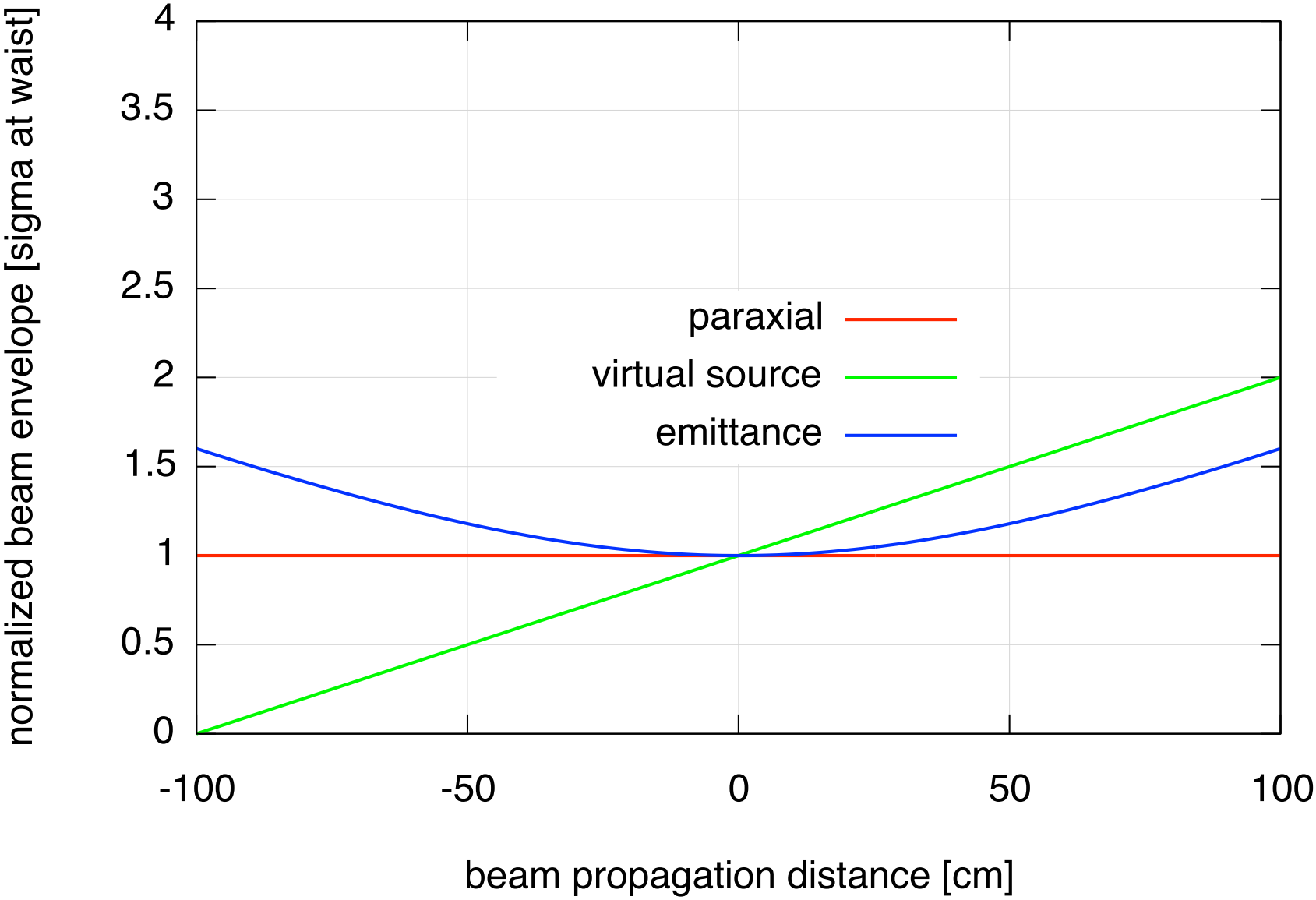
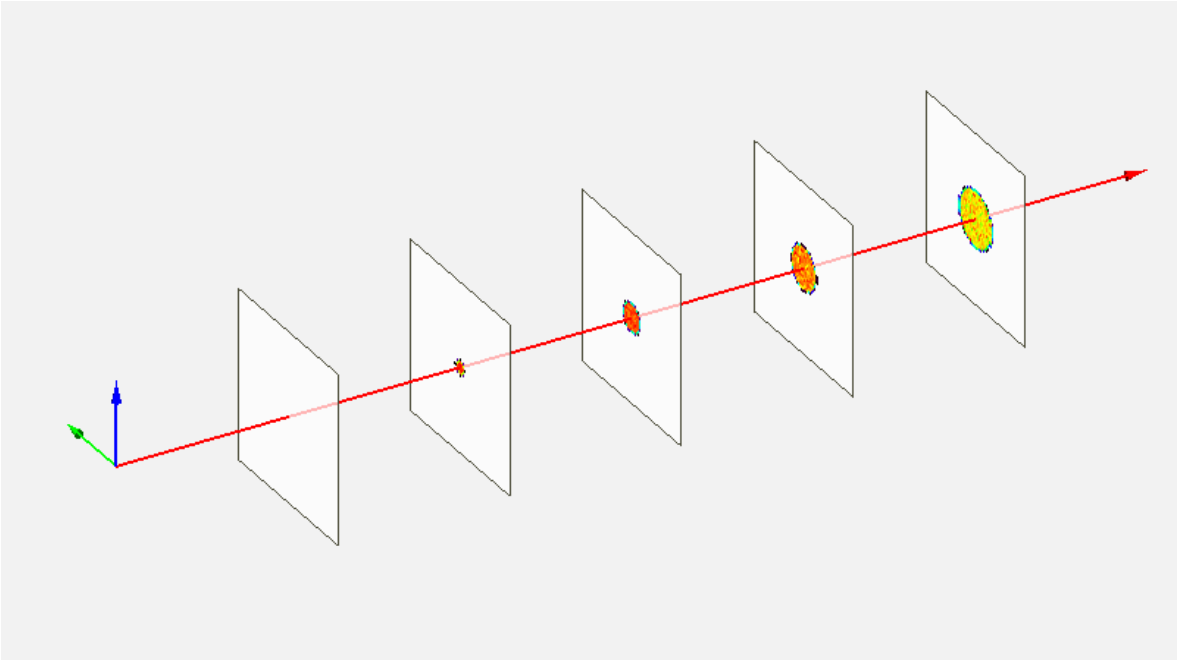
Emittance model

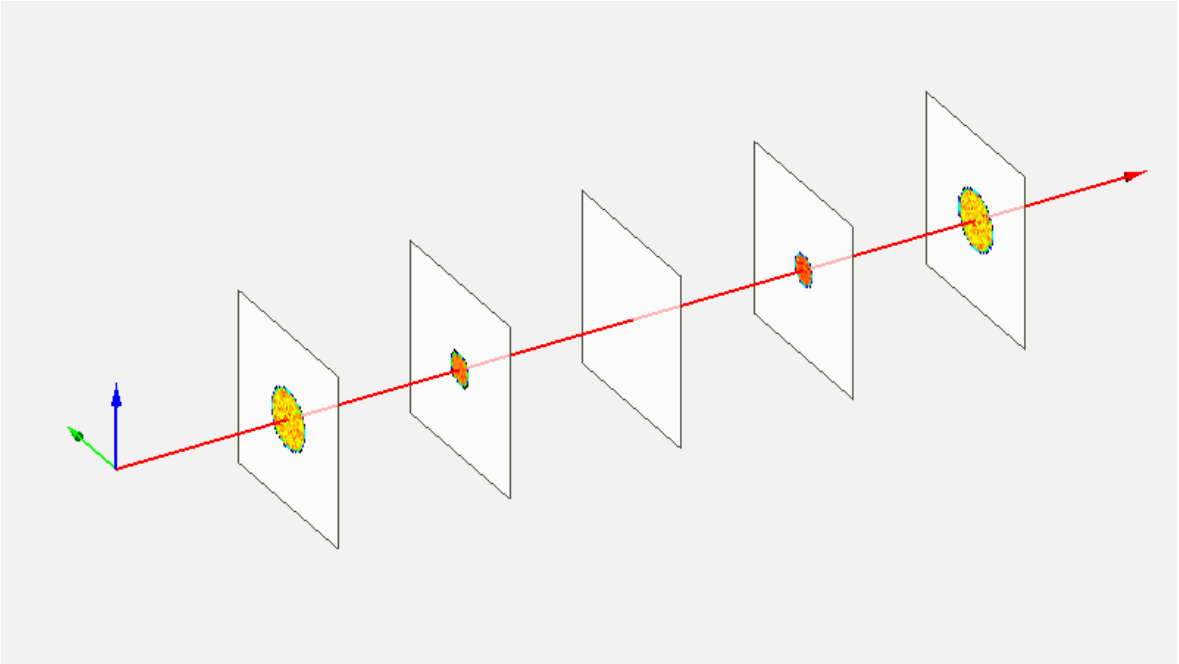




Virtual source

source position is at about 6 m from isocentre @ CNAO

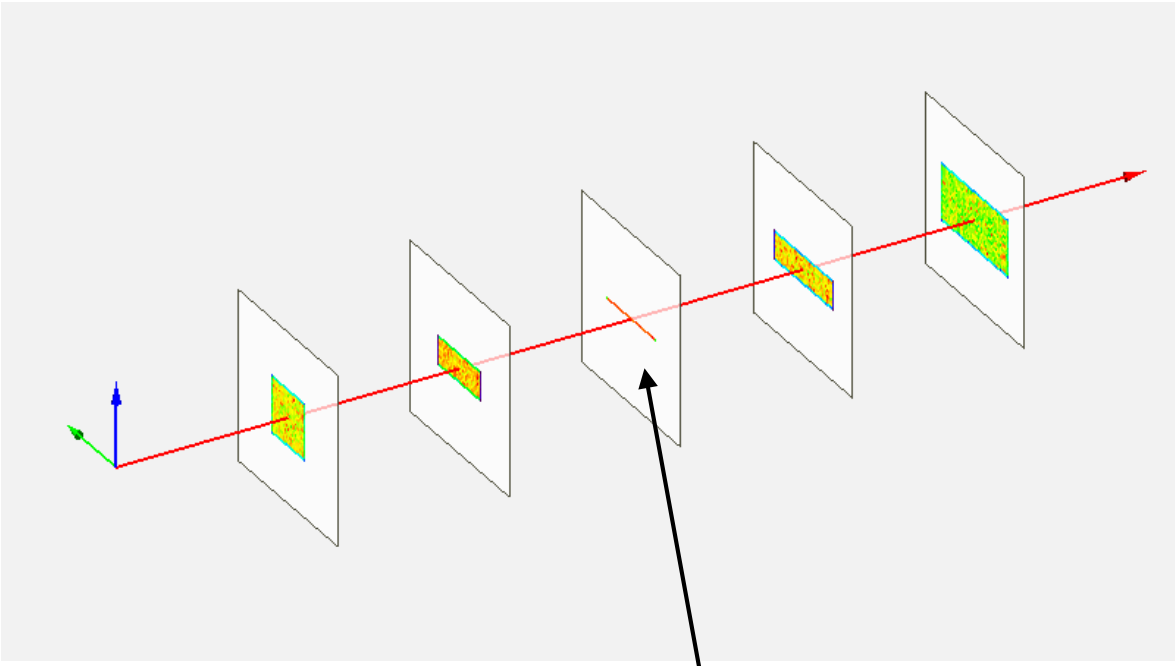
2 mrad divergence



Emittance model

Twiss beta is about 80 cm @ CCB

6% sigma increase at 30 cm from waist



line focus

Astigmatic source

(if needed!)

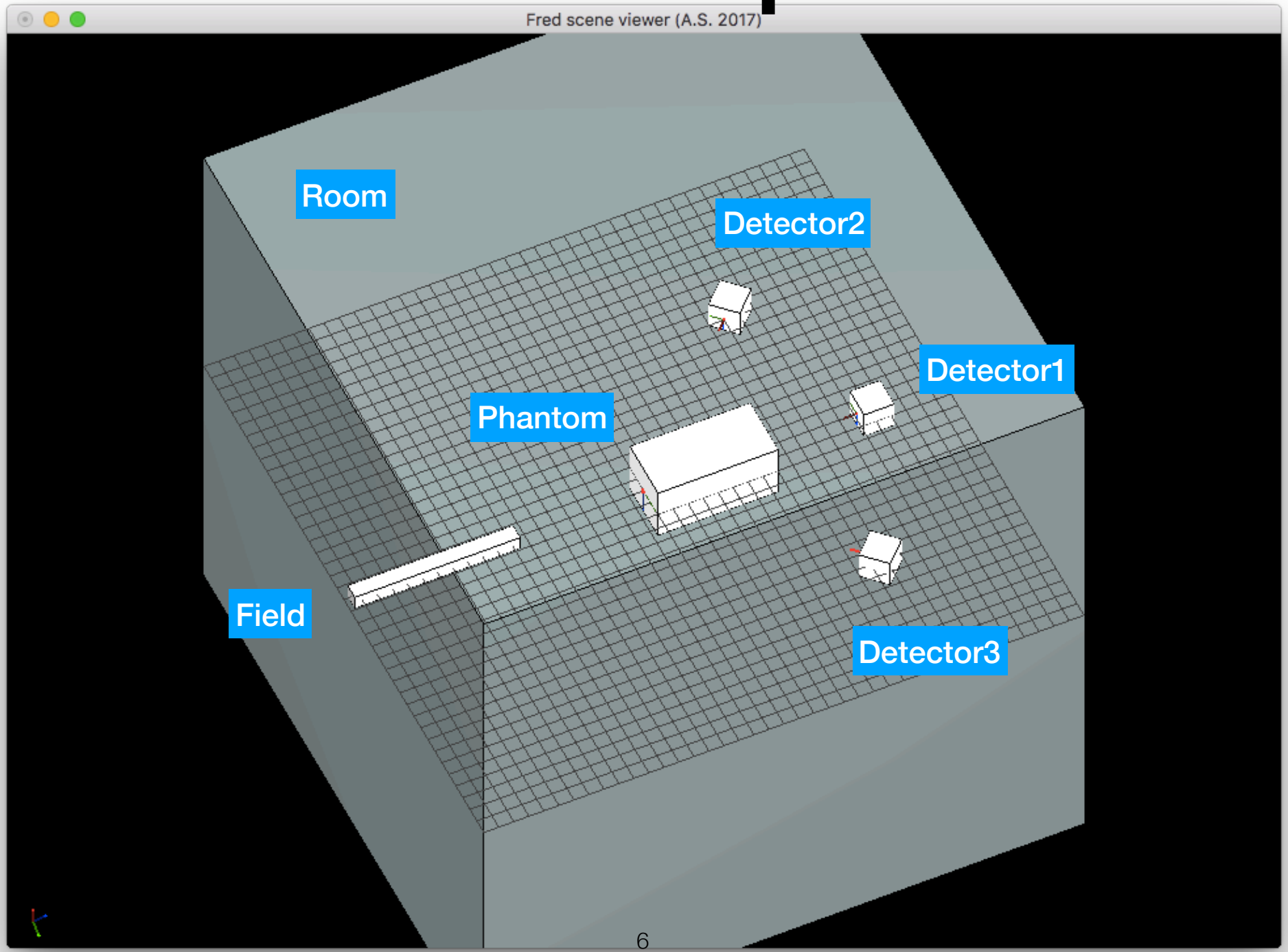
Region input

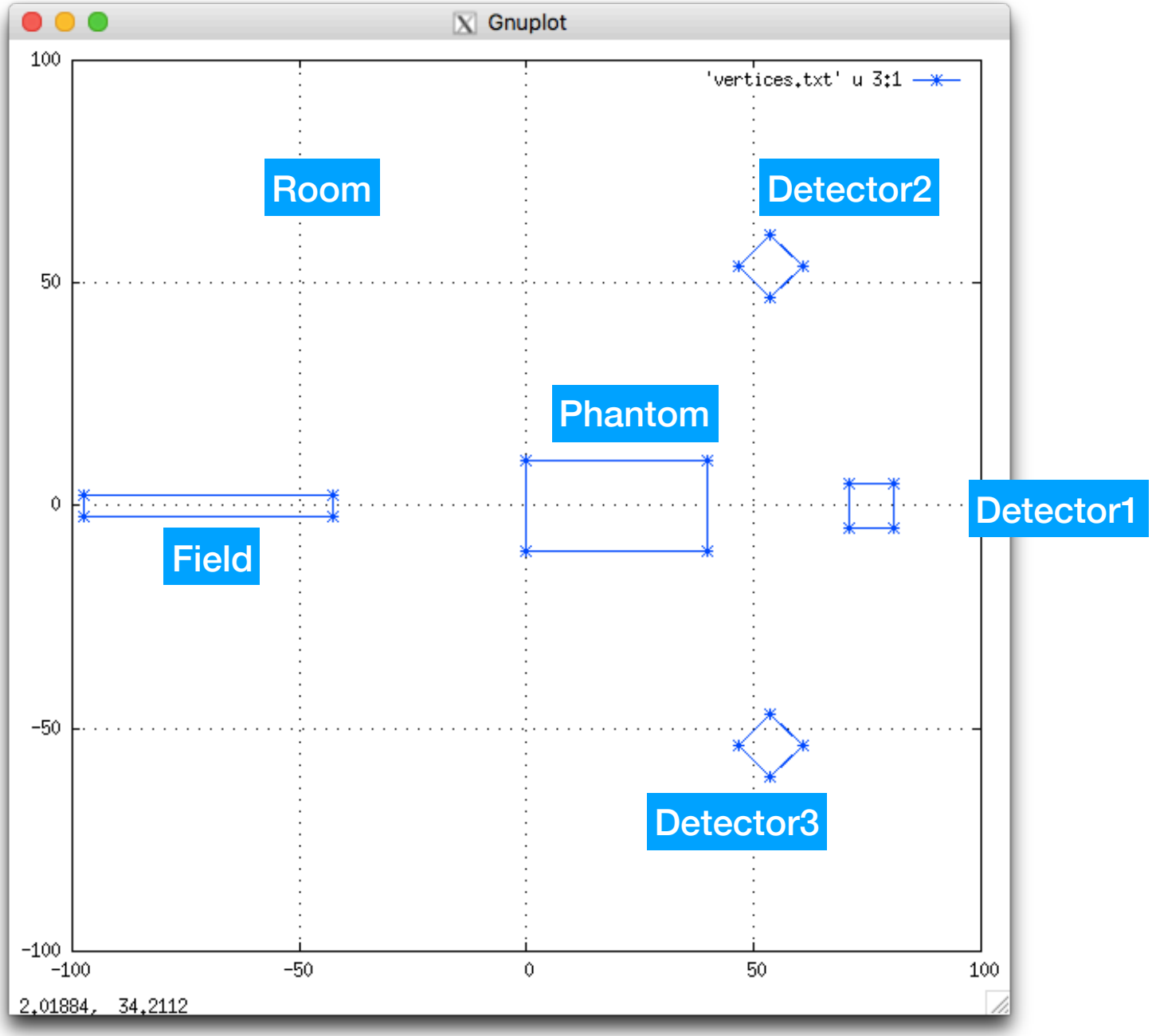
```
region<
 ID = phantom
 L=[20,20,40]
 O=[0 ,0, 0 ]
 pivot=[0.5,0.5,0.0]
 maxStepSize=22
region>

region<
 ID=detector1 ; L=[10,10,10];
 O=[-50,0,50 ] # comment bla bla bla
 pivot = [0.5, 0.5,1.0]
 u = [0,1,0]
 lookAt = [0,0,0]
 fromDistance = 71
region>

region<
    ID=room
    maxStepSize=7
region>
```

Defaults:

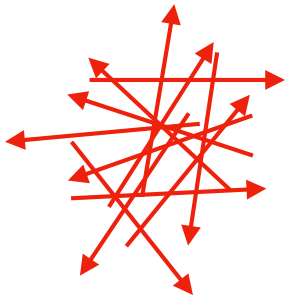
Room
Phantom
Field

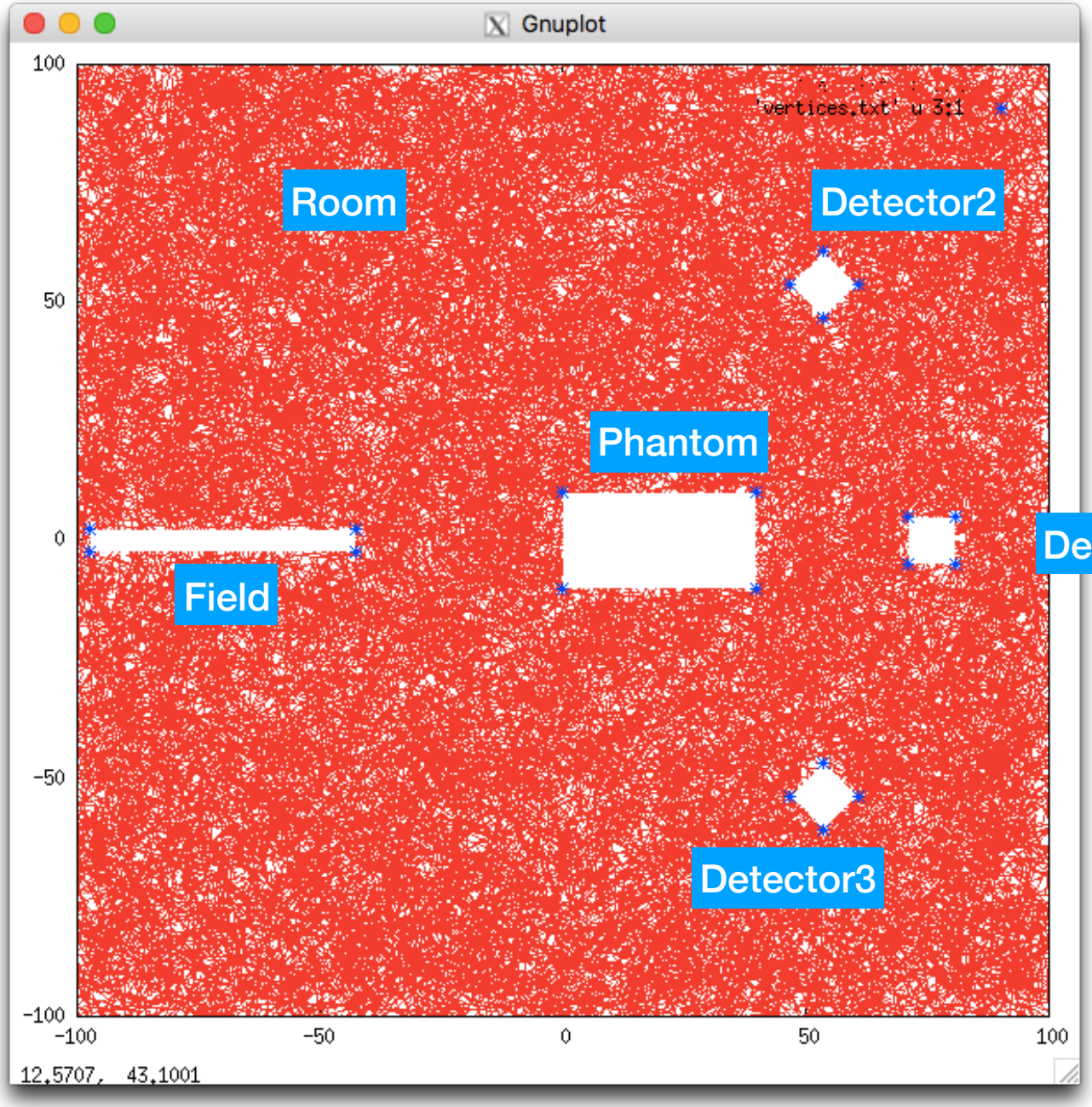
Scene in OpenGL



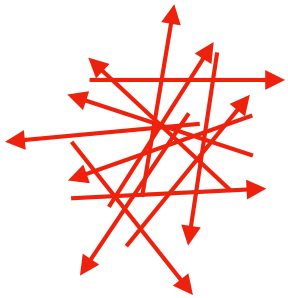

Gnuplot
'vertices.txt' u 3:1
Room
Detector2
Phantom
Field
Detector1
Detector3
100
50
0
-50
-100
-100
-50
0
50
100
2.01884, 34.2112

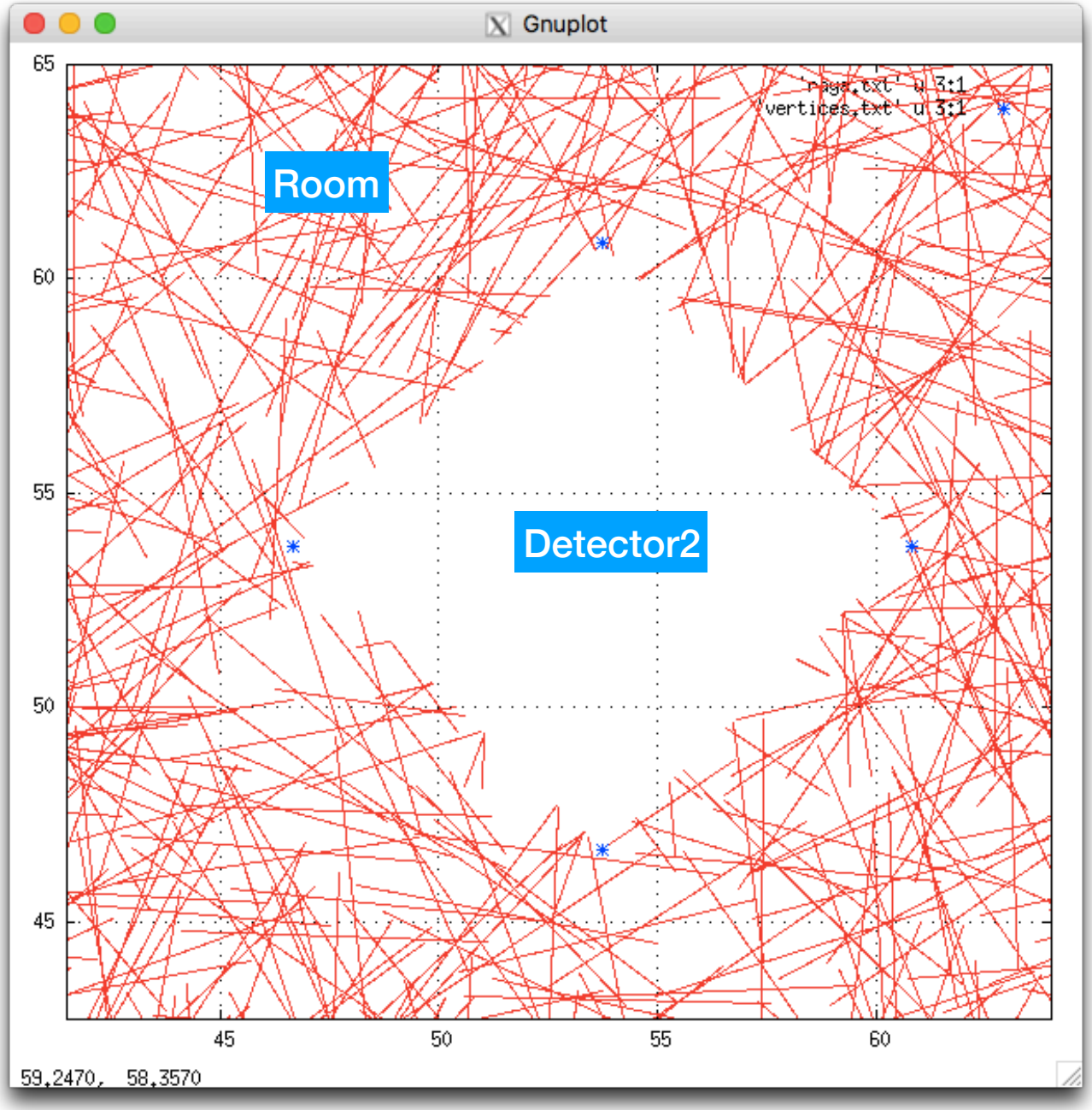
Georays

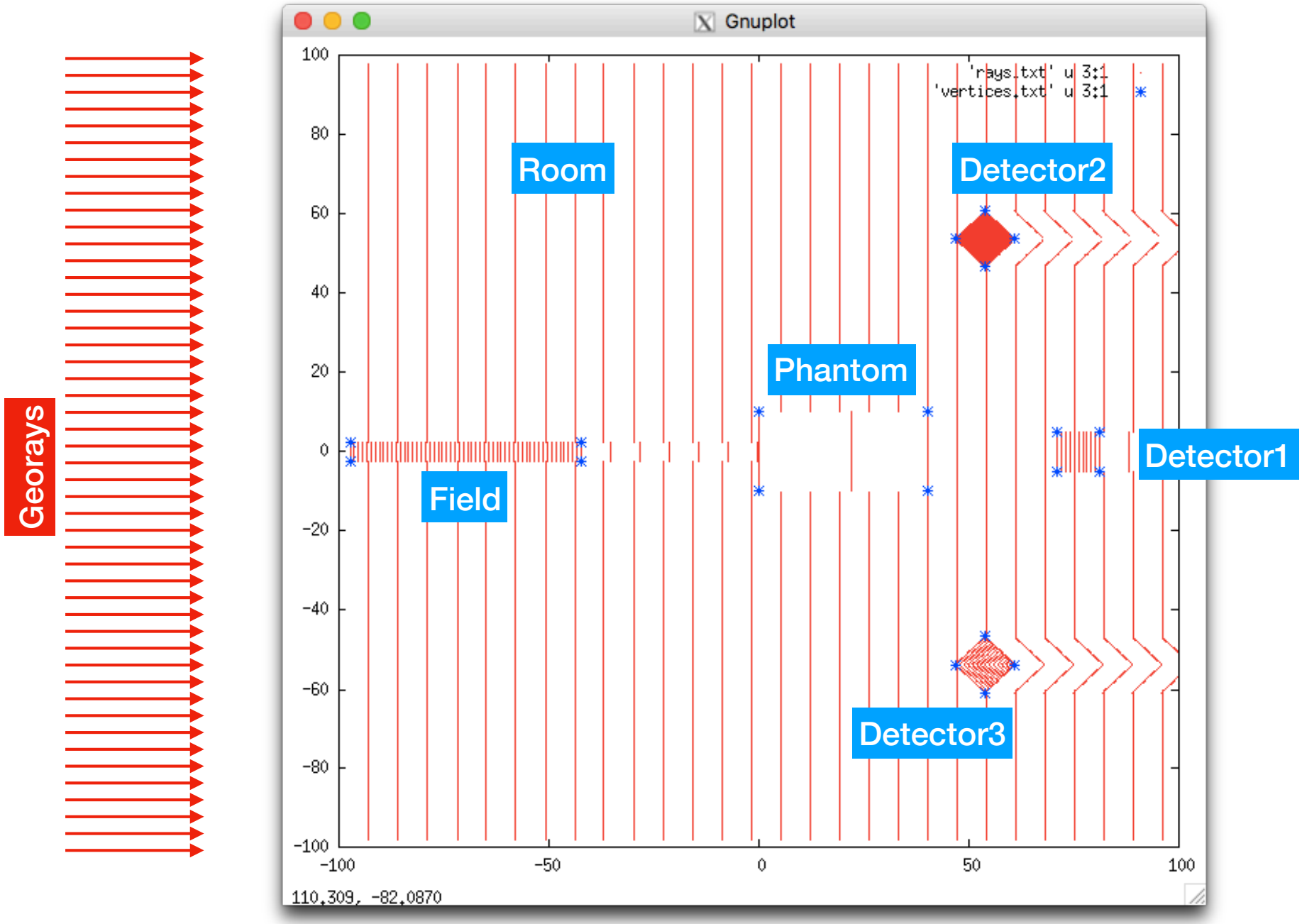



Gnuplot
'vertices.txt' u 3:1
Room
Detector2
Phantom
Field
Detector1
Detector3
100
50
0
-50
-100
-100
-50
0
50
100
12.5707, 43.1001

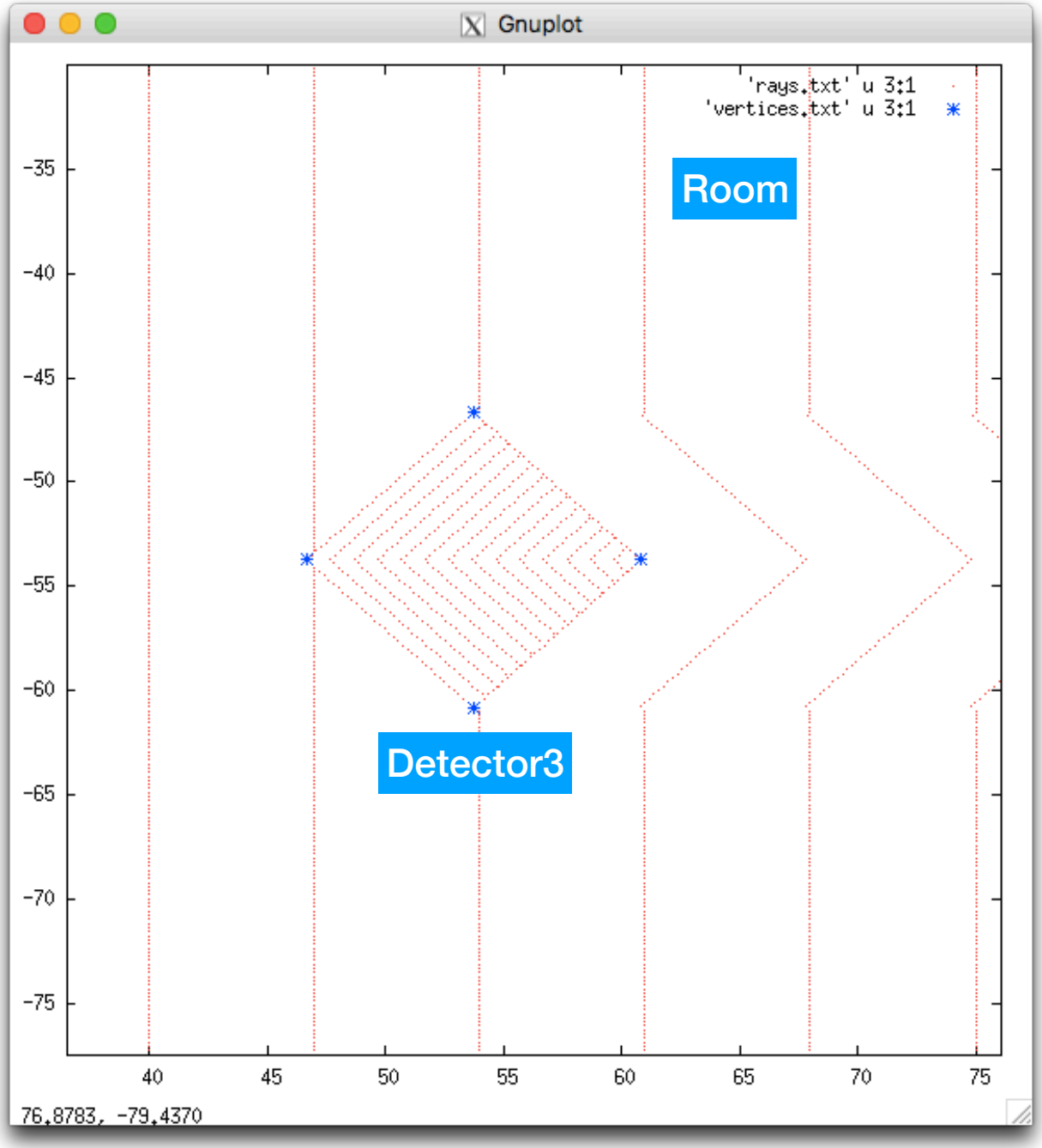
Georays




Gnuplot
'rays.txt' u 3:1
'vertices.txt' u 3:1
Room
Detector2
65
60
55
50
45
45
50
55
60
59.2470, 58.3570


Georays
Gnuplot
'rays.txt' u 3:1
'vertices.txt' u 3:1
Room
Detector2
Phantom
Field
Detector1
Detector3
100
80
60
40
20
0
-20
-40
-60
-80
-100
-100
-50
0
50
100
110.309, -82.0870

Georays


Gnuplot
'rays.txt' u 3:1
'vertices.txt' u 3:1
Room
Detector3
-35
-40
-45
-50
-55
-60
-65
-70
-75
40
45
50
55
60
65
70
75
76.8783, -79.4370

Schedule

- region input
- default region modification (room,phantom)
- region navigation
- contiguous array for material index for all regions
- importing region navigation into GPU code