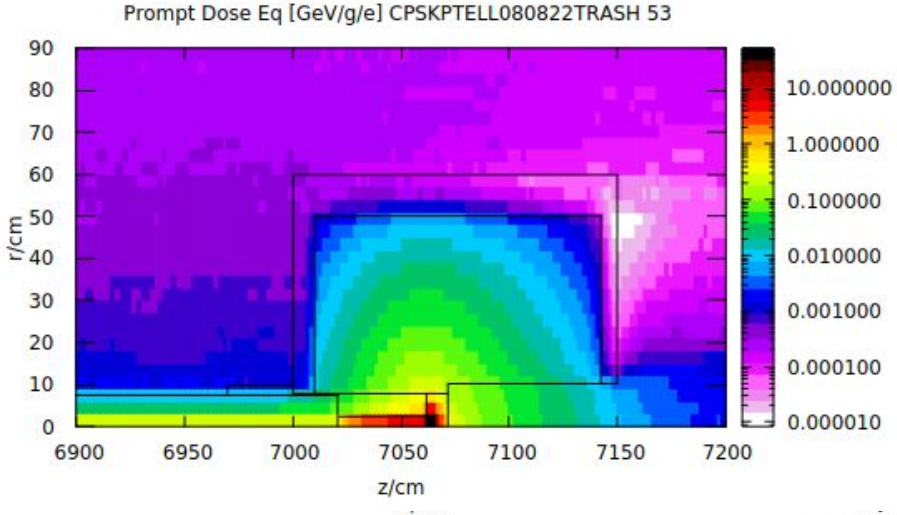
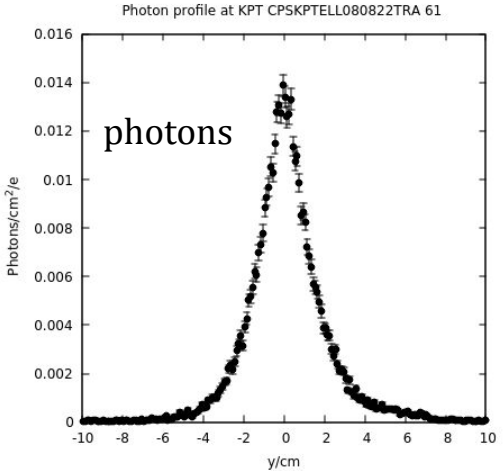
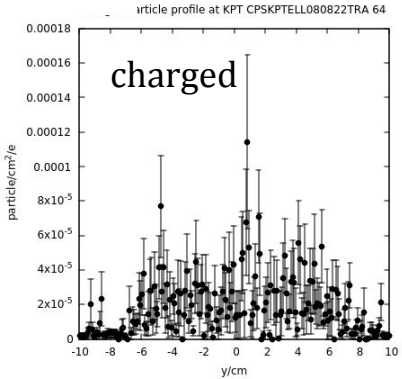
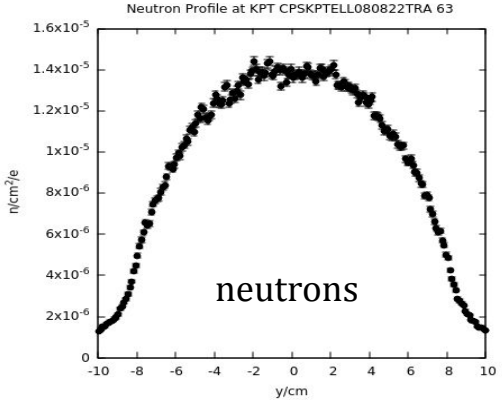
Kaon Production Target

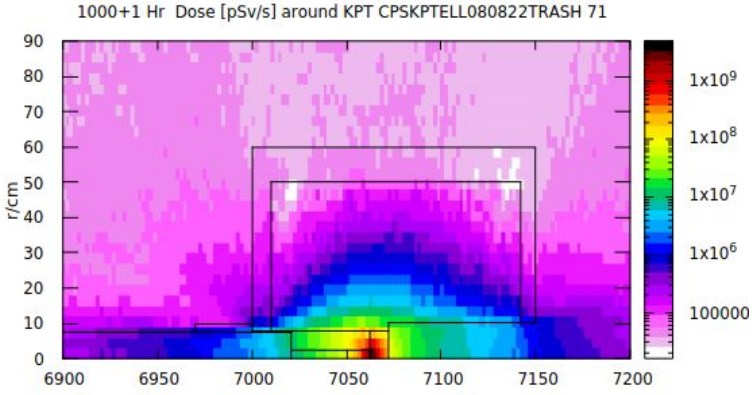
KPT prompt Dose Eq and photon Beam at KPT.

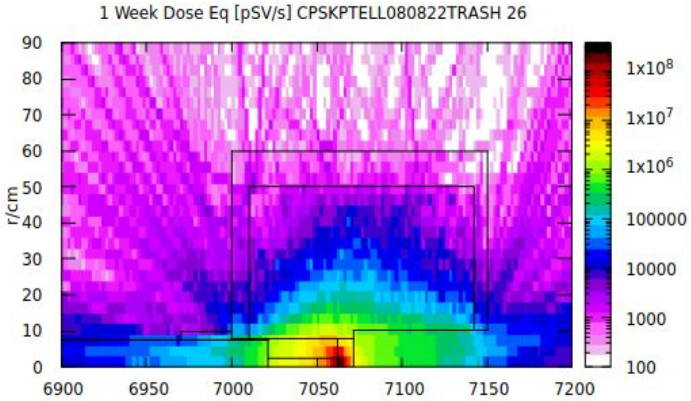


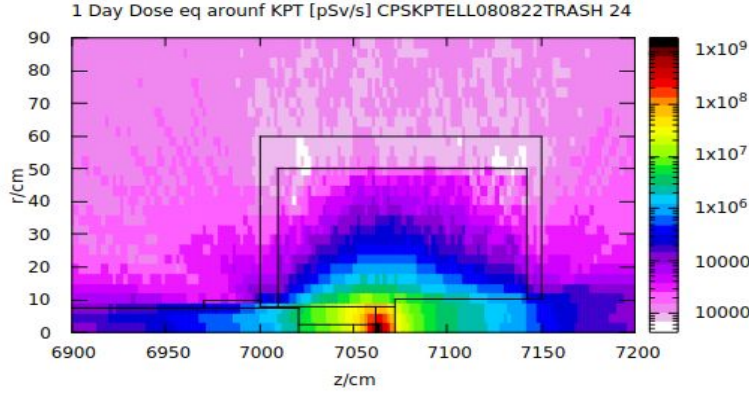


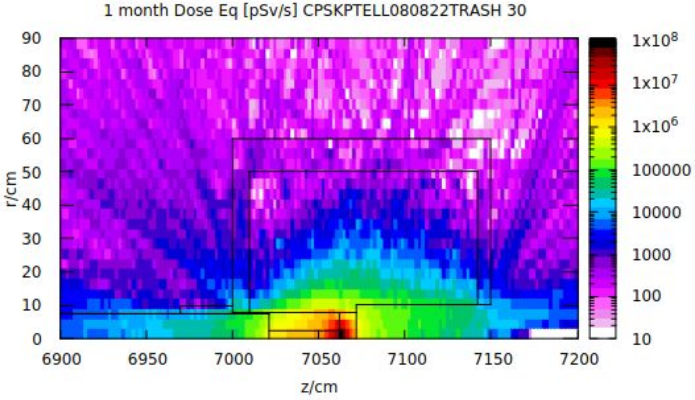





1000+1 Hr Dose [pSv/s] around KPT CPSKPTELL080822TRASH 71
r/cm
0
10
20
30
40
50
60
70
80
90
6900
6950
7000
7050
7100
7150
7200
1x10^9
1x10^8
1x10^7
1x10^6
100000

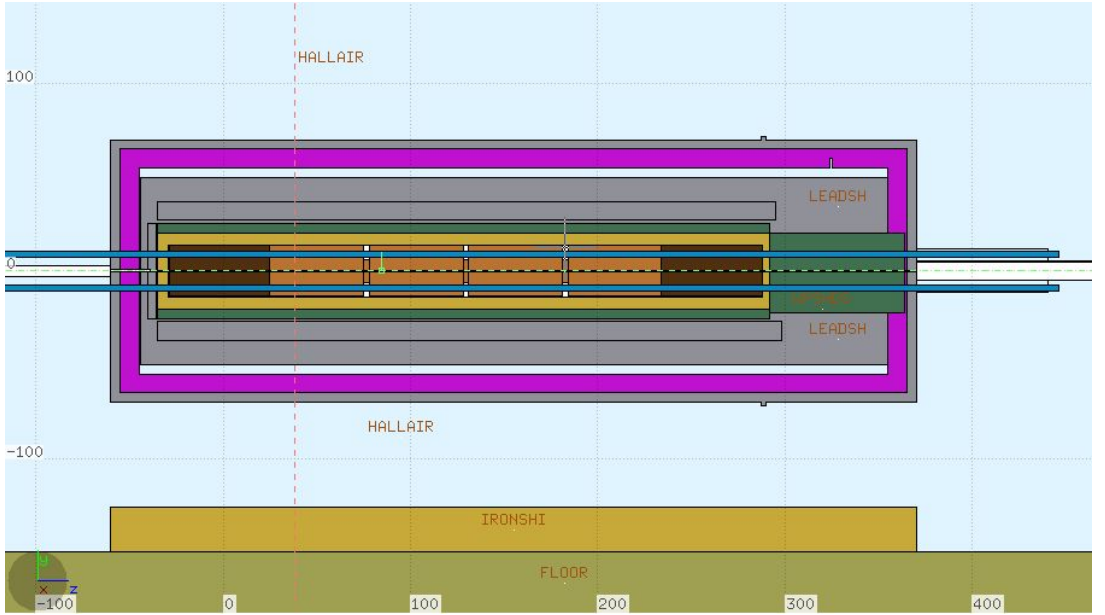

1 Week Dose Eq [pSV/s] CPSKPTELL080822TRASH 26
r/cm
0
10
20
30
40
50
60
70
80
90
6900
6950
7000
7050
7100
7150
7200
1x10^8
1x10^7
1x10^6
100000
10000
1000
100

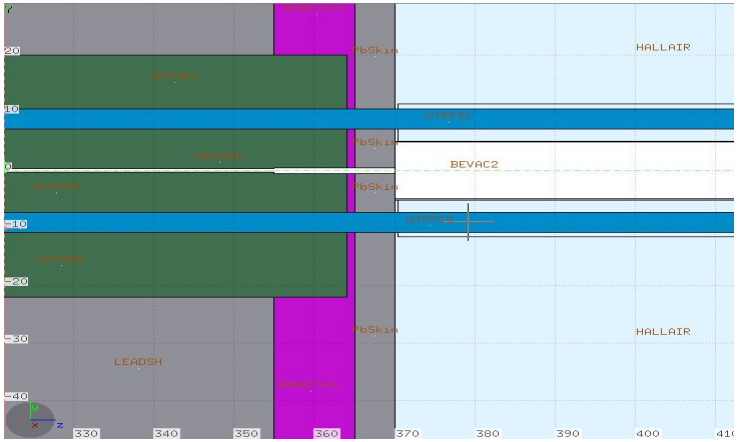

1 Day Dose eq arounf KPT [pSv/s] CPSKPTELL080822TRASH 24
r/cm
0
10
20
30
40
50
60
70
80
90
6900
6950
7000
7050
7100
7150
7200
z/cm
1x10^9
1x10^8
1x10^7
1x10^6
10000
10000

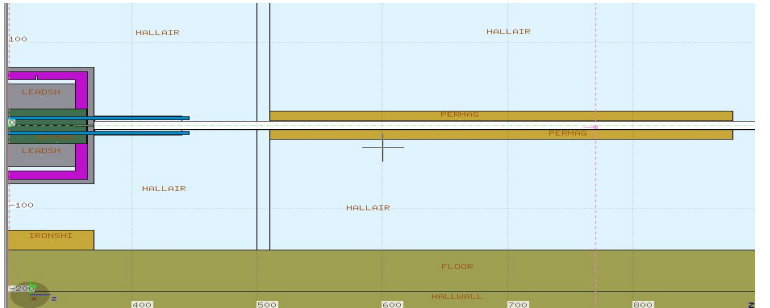

1 month Dose Eq [pSv/s] CPSKPTELL080822TRASH 30
r/cm
0
10
20
30
40
50
60
70
80
90
6900
6950
7000
7050
7100
7150
7200
z/cm
1x10^8
1x10^7
1x10^6
100000
10000
1000
100
10

Compact Photon Source

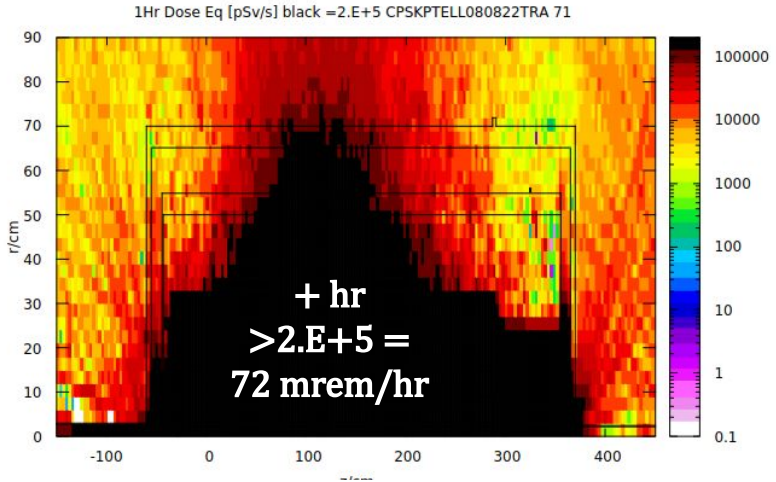
CPS Latest Model with Segmented Absorber and Trimper at the CPS exit

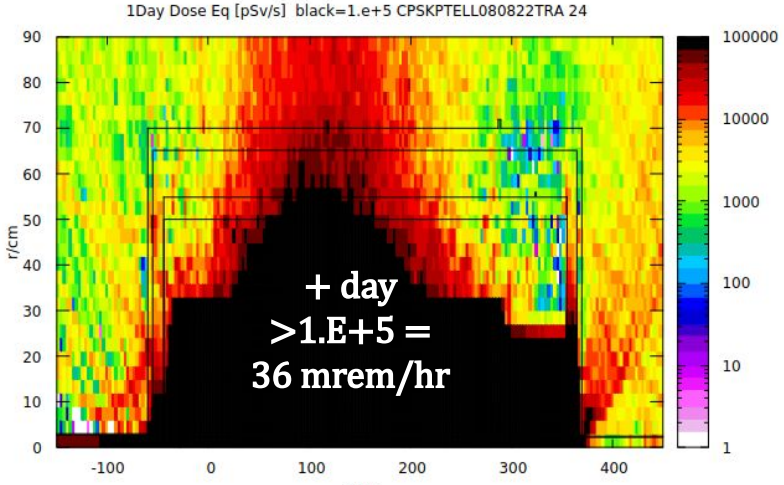


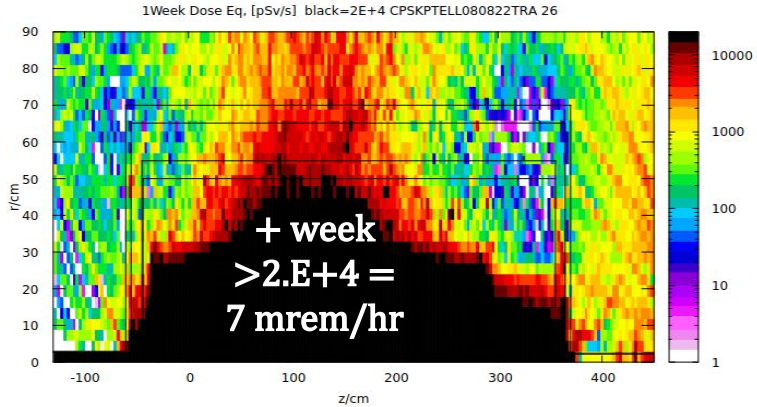


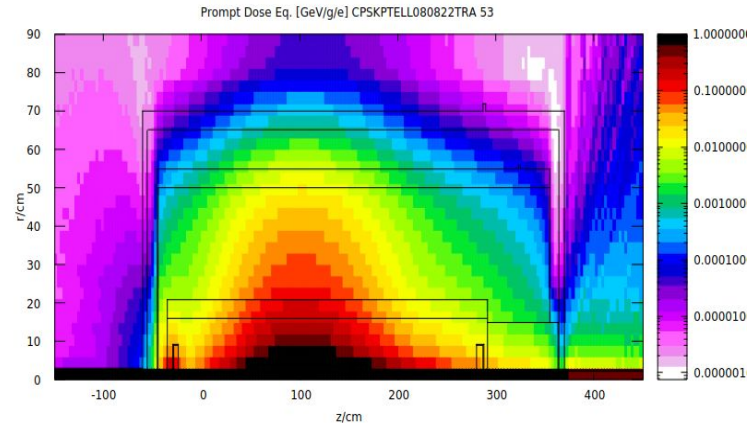


Latest Model. After 1000 hr + Dose Equivalent profiles within 1' around the CPS.

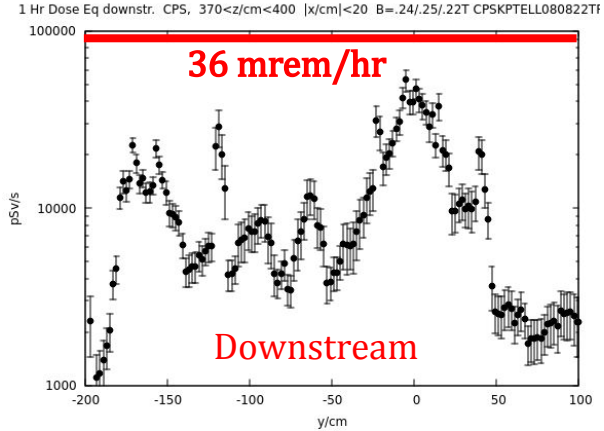


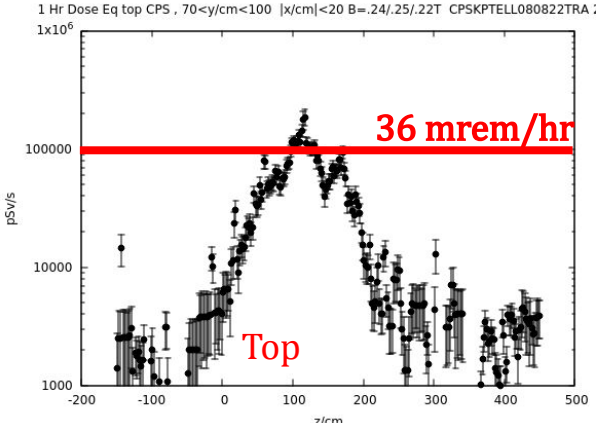


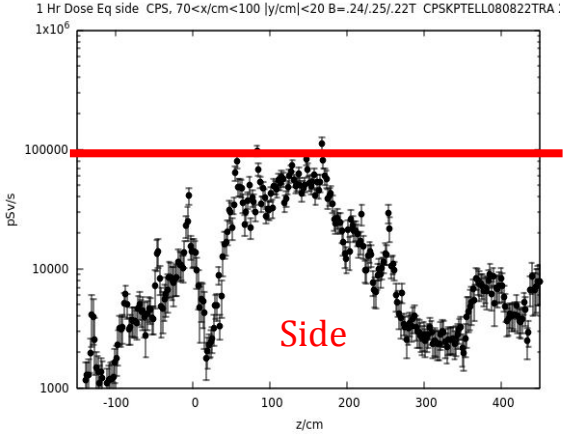


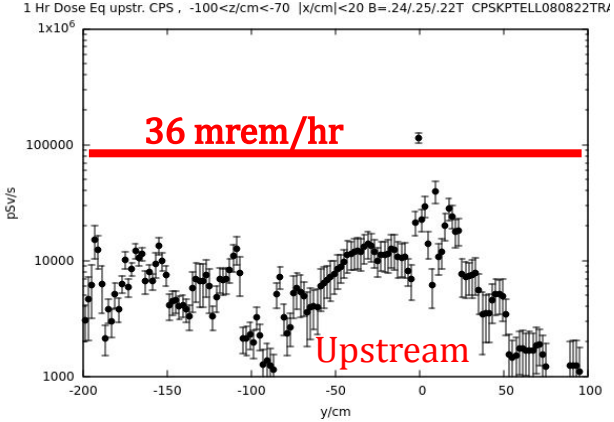


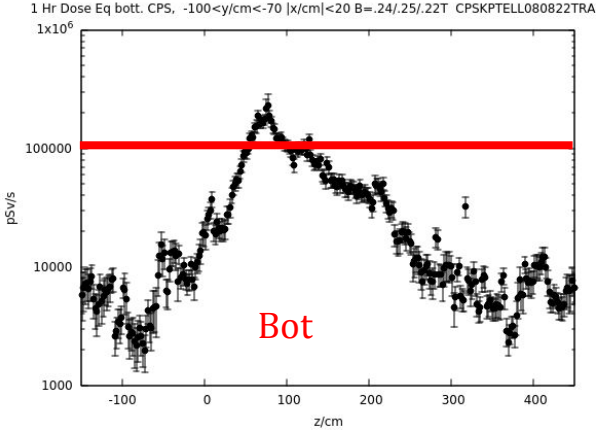
Latest Model. After 1000 +1 hr Dose Equivalent profiles within 1' around the CPS.





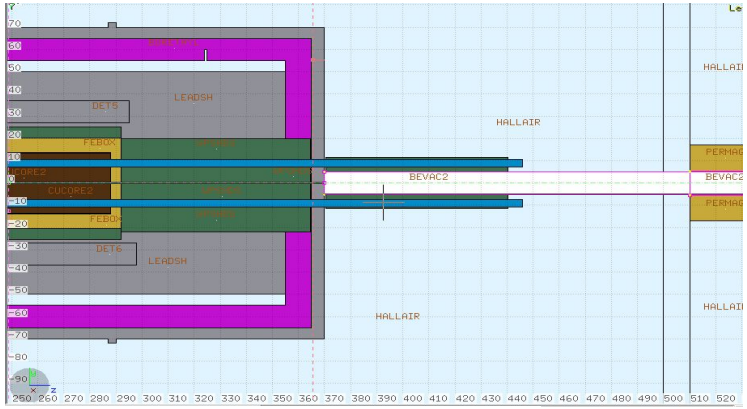


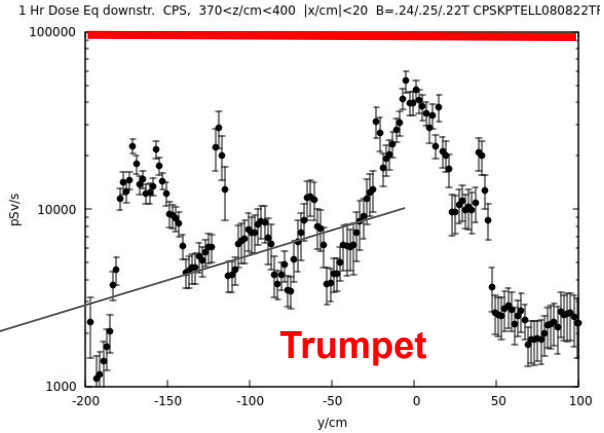


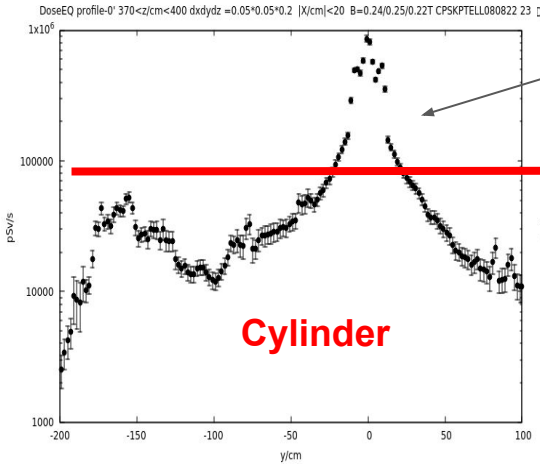


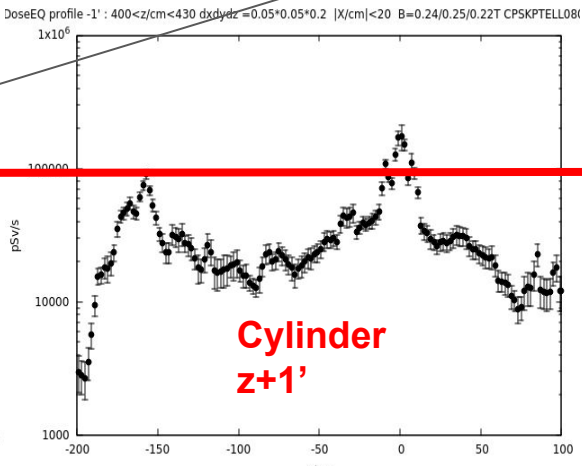
- Activation at the downstream side is low.
- Service lines may be placed at the CPS exit.

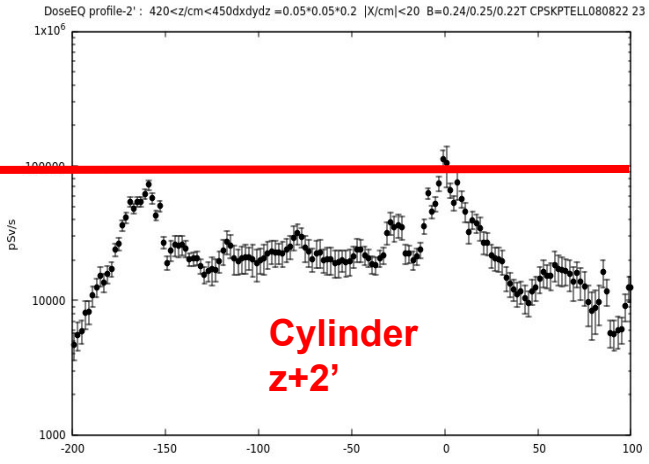
Comparison with Previous CPS model with W Cylinder; No trumpet. After 1000+1hr Dose Eq.



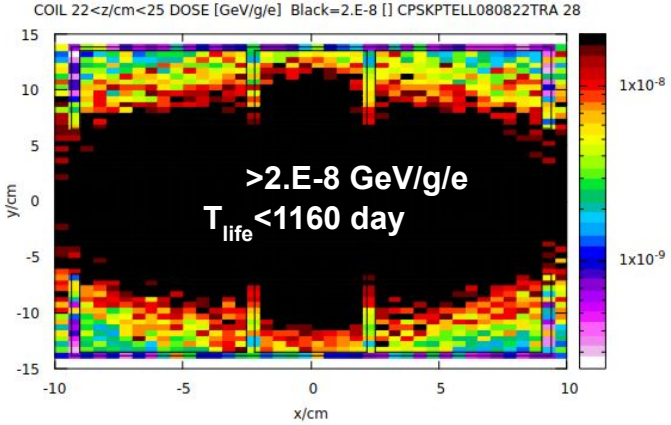


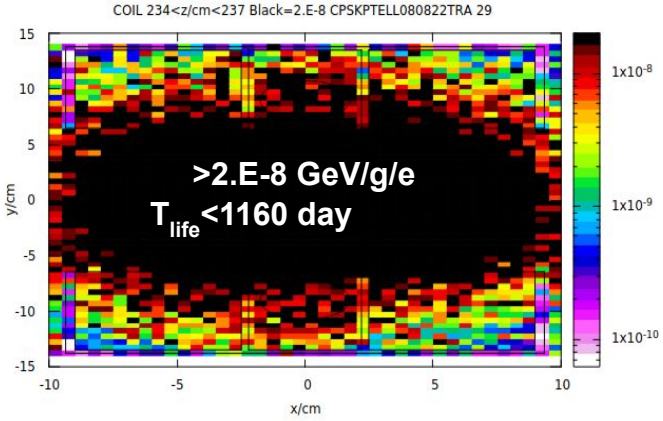


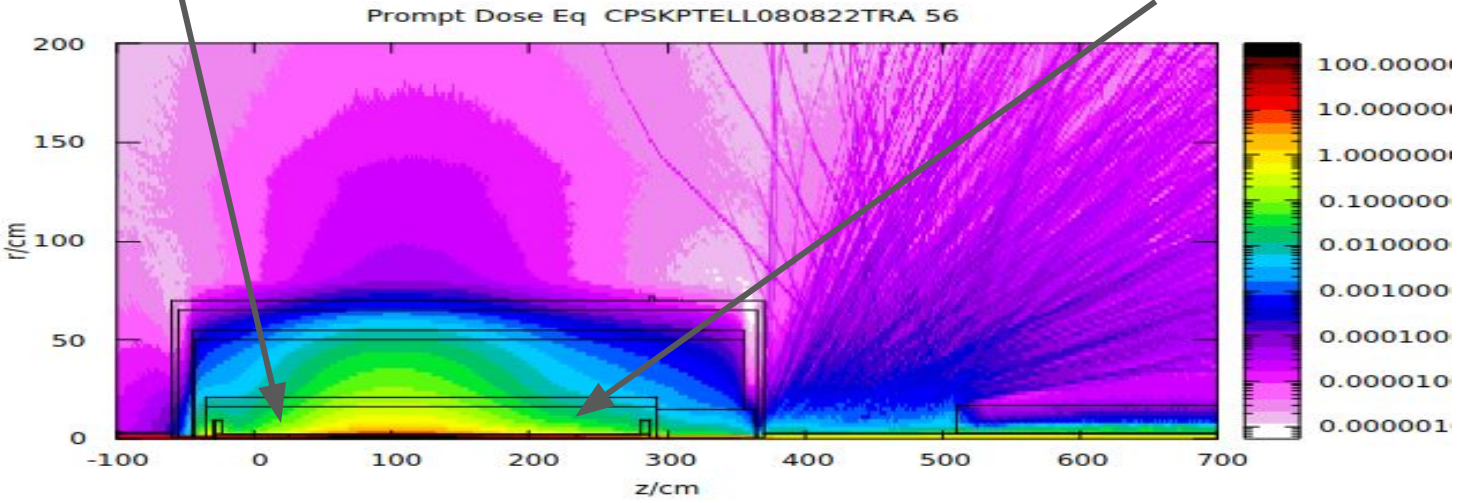




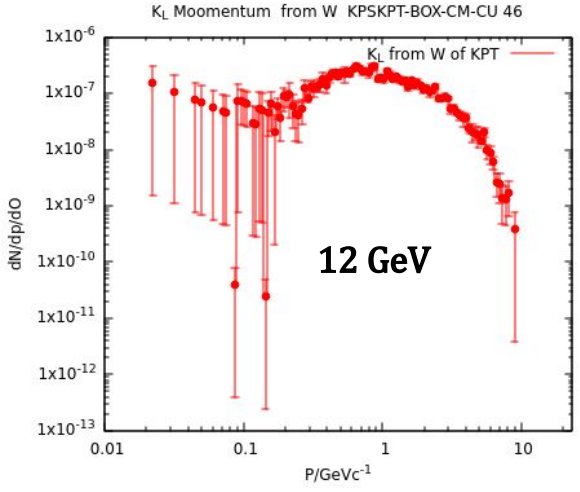
Latest CPS model. Coil Insulation lifetime (Kapton 1.E+7 Gy) and Prompt Radiation

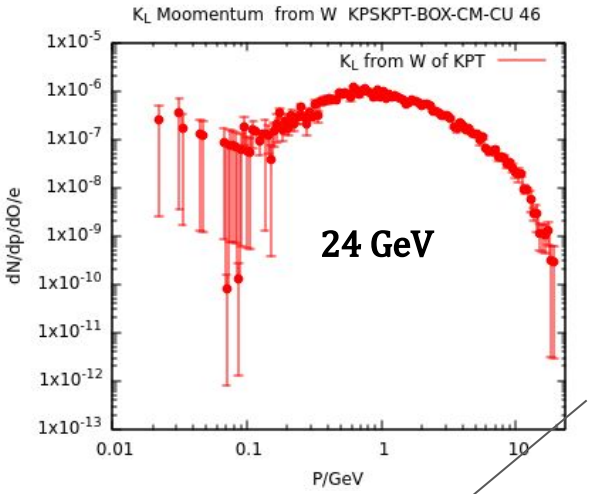


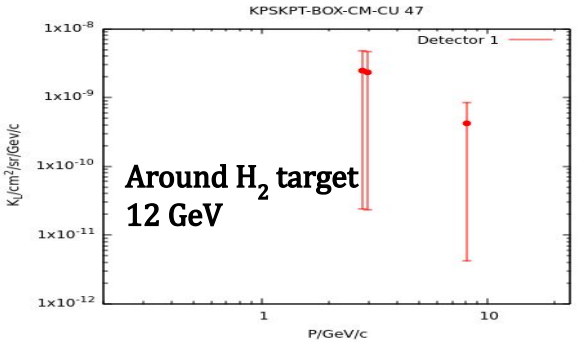


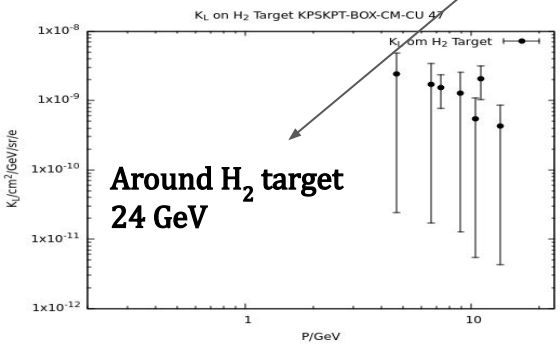


K-long yield vs beam energy. Week of calculations.









- The yield of K-longs at 24 GeV is ~5 times higher
- Area :
  d=20 cm vs d=6 cm for Target H_2
- Integral Under P-spectrum at 24 Gev

$S=\sim 1.E\text{-}9\ [K_L/e/GeVc^{-1}]*10\ [GeVc^{-1}]=$

$=1.E\text{-}8[K_L/e]$

- Counting rate

$dK_L/dt=S*de^-/dt=$

$=1.E\text{-}8\ [K_L/e]*3.E+13\ [e/s]*(6/20)^2=$

$=\sim 3.E+4\ [K_L/s].$

Next Step for Temperature Calculations.

As FLUKA export to “OPEN SCAD” does not work correctly let’s

1.Include Magnet design from the drawing with external dimensions of Iron Yoke

box(x:X,y:Y,z:Z) = box(-16:16,-20.4:20.4,-35:292)

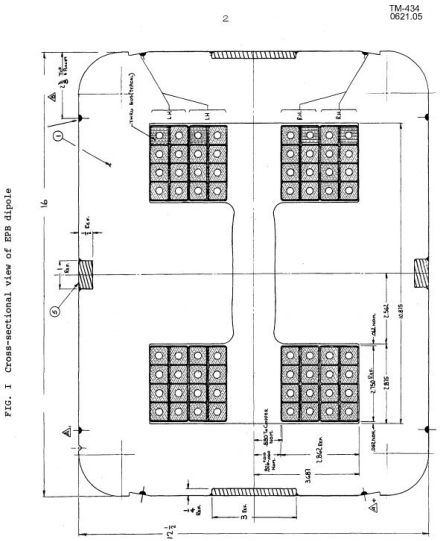
2. include WCu shield as a difference of two box(x:X,y:Y,z:Z):

WCu Shield = box(-21:21,-25:25,-40:355)-box(-16:16,-20.4:20.4,-35:292)

Lead Shield = box(-50:50,-50:50,-44:356)-box(-21:21,-25:25,-40:355)

Bor-Polyeth = box(-65:65,-65:65,-55:365)-box(-50:50,-50:50,-44:356)

Lead….Skin = box(-70:70,-70:70,-60:370)-box(-65:65,-65:65,-55:365)



After 1000 hr of operation Dose Equivalent in and around the KPT.