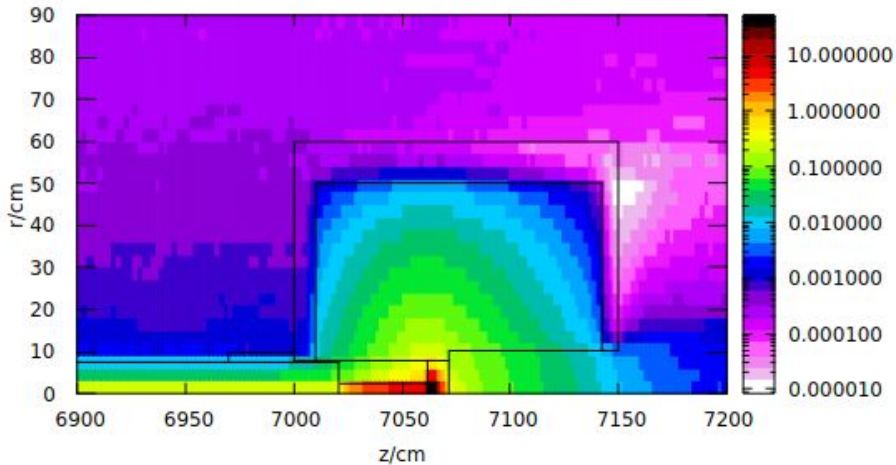


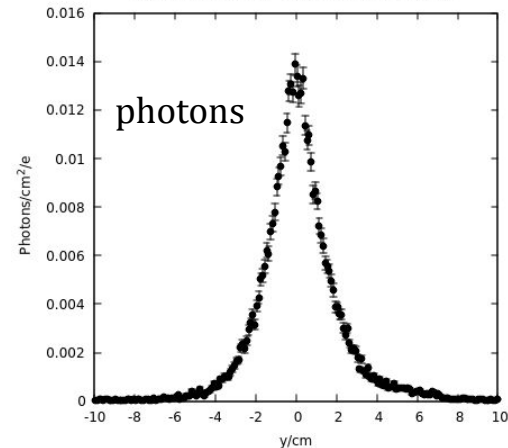
# Kaon Production Target

# KPT prompt Dose Eq and photon Beam at KPT.

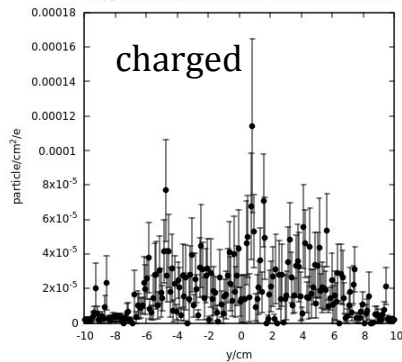
Prompt Dose Eq [GeV/g/e] CPSKPTCELL080822TRASH 53



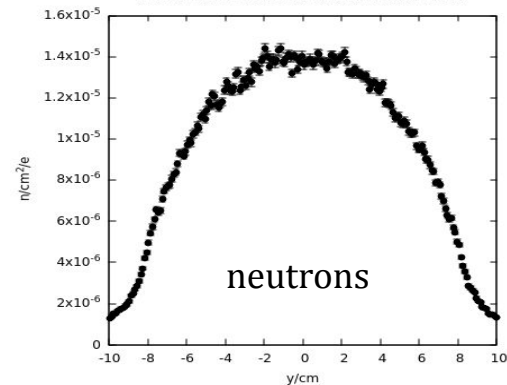
Photon profile at KPT CPSKPTCELL080822TRA 61



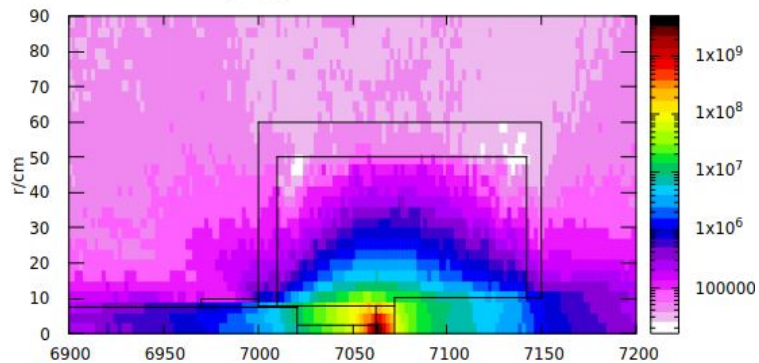
particle profile at KPT CPSKPTCELL080822TRA 64



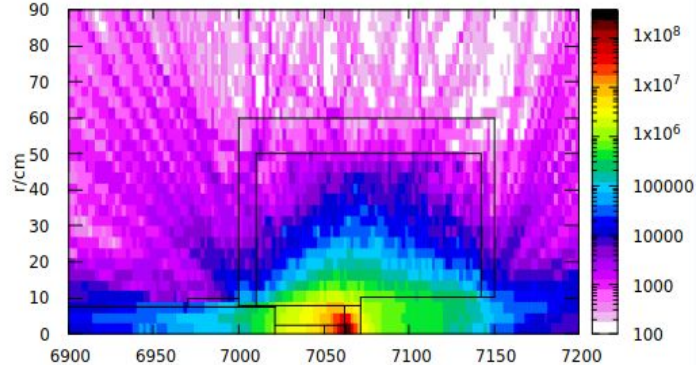
Neutron Profile at KPT CPSKPTCELL080822TRA 63



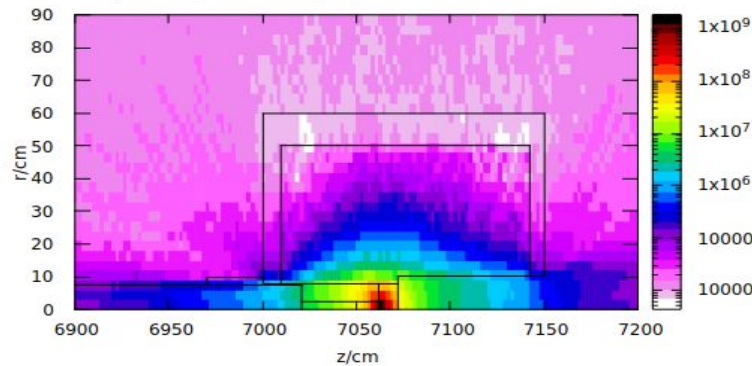
1000+1 Hr Dose [pSv/s] around KPT CPSKPTCELL080822TRASH 71



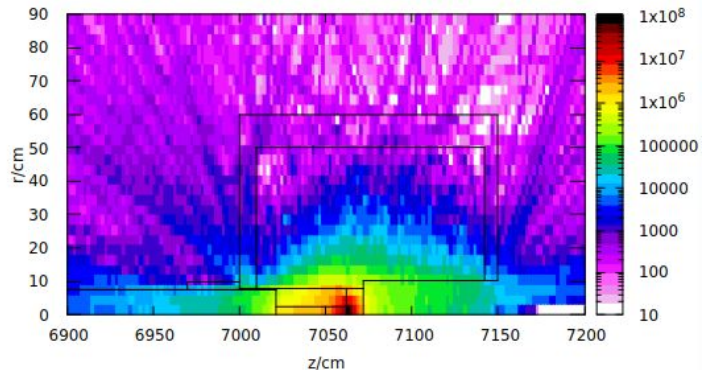
1 Week Dose Eq [pSv/s] CPSKPTCELL080822TRASH 26



1 Day Dose eq around KPT [pSv/s] CPSKPTCELL080822TRASH 24

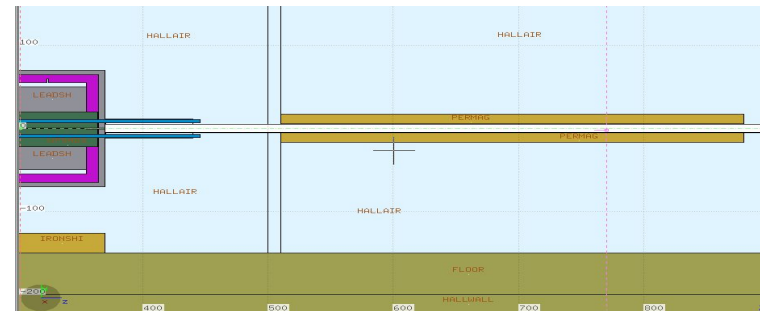
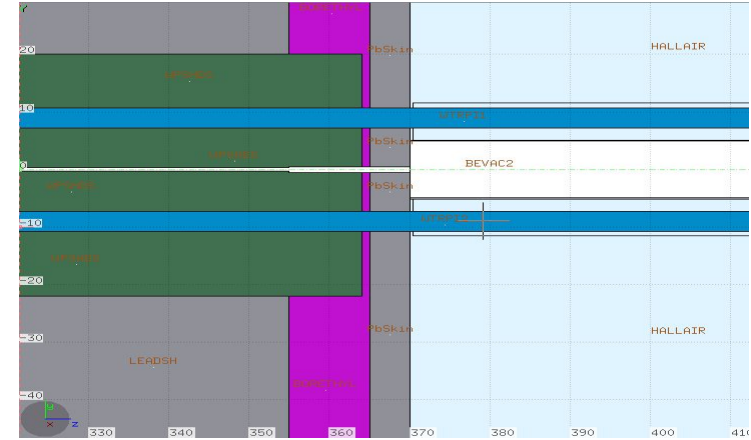
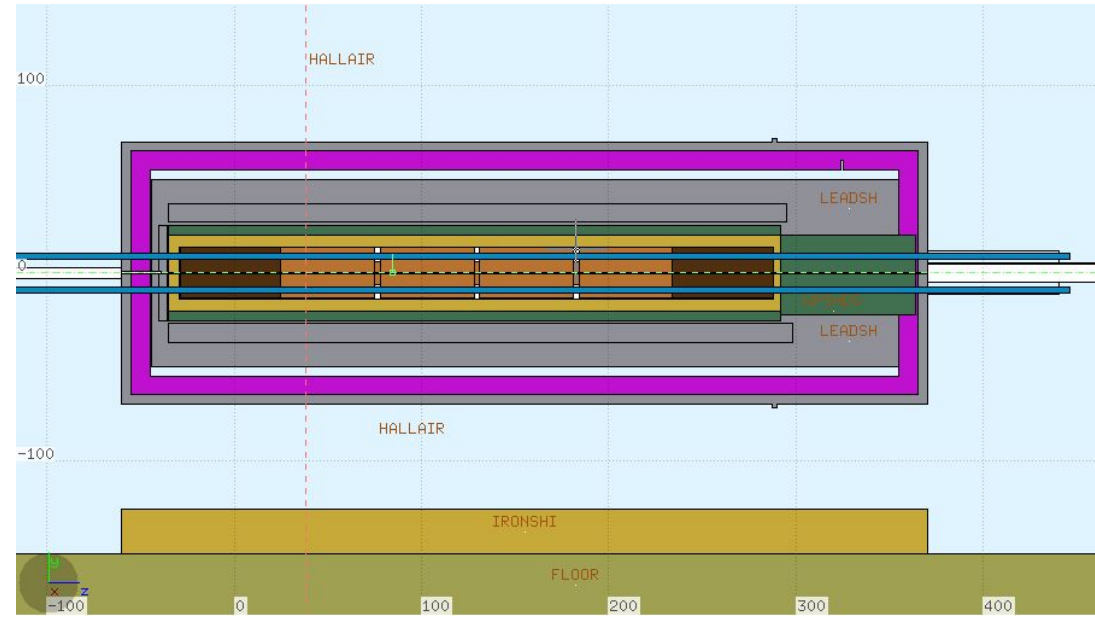


1 month Dose Eq [pSv/s] CPSKPTCELL080822TRASH 30

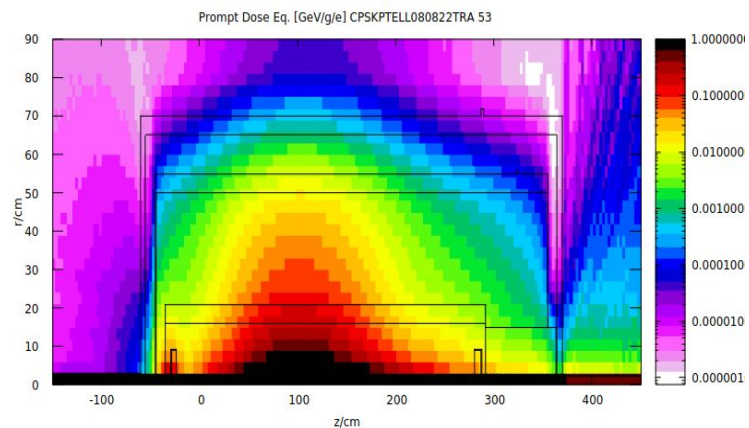
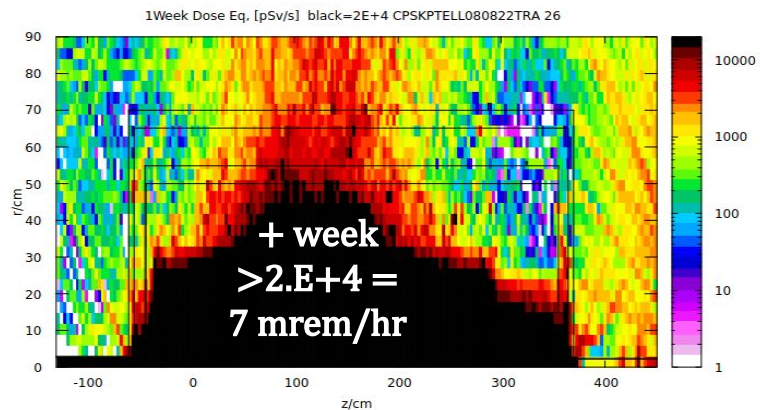
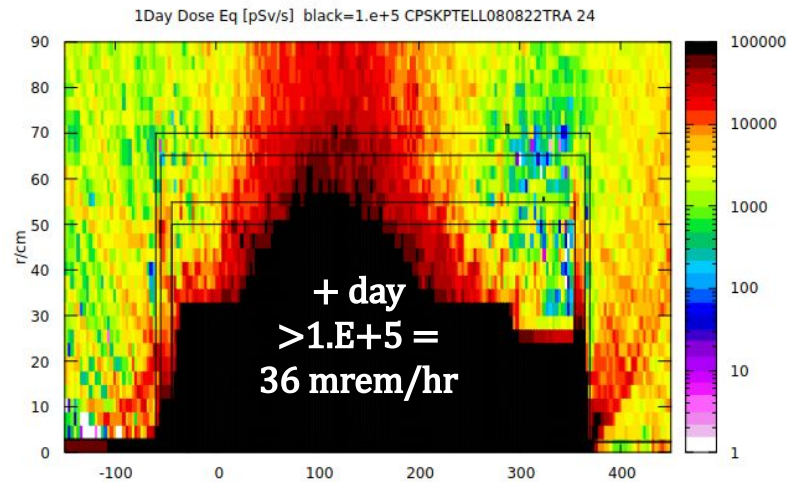
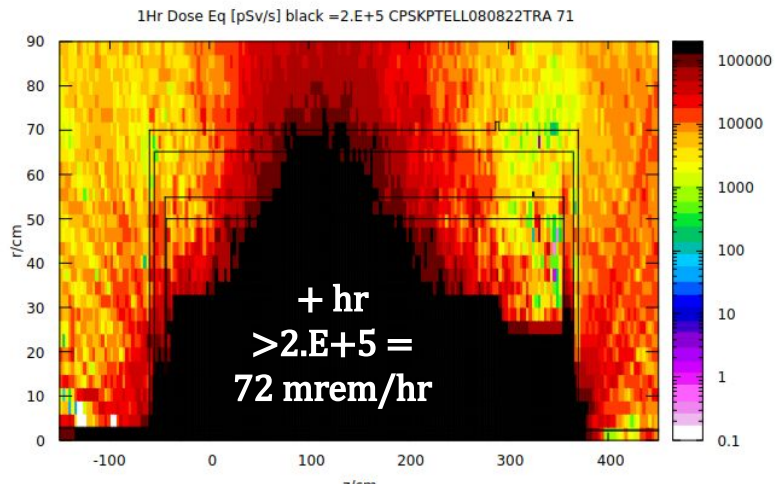


# Compact Photon Source

# CPS Latest Model with Segmented Absorber and Trimmer at the CPS exit

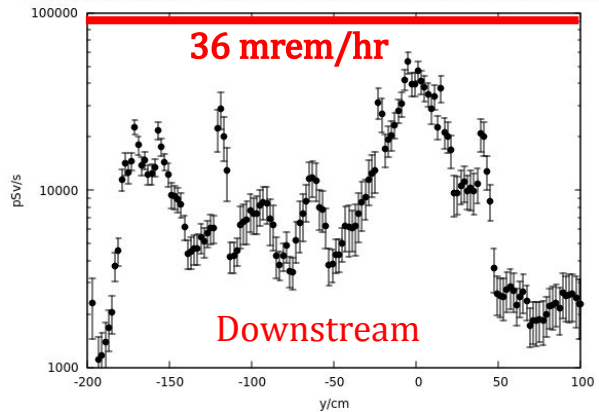


# Latest Model. After 1000 hr + Dose Equivalent profiles within 1' around the CPS.

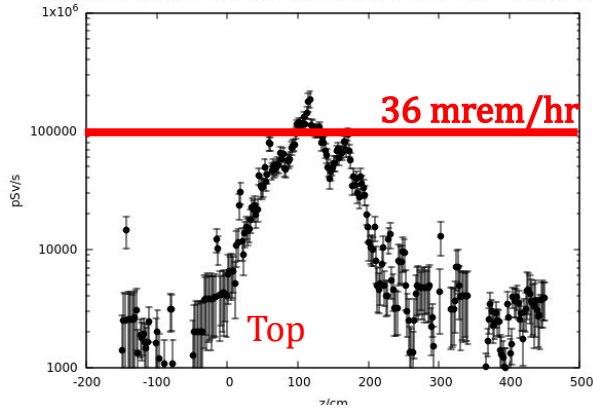


# Latest Model. After 1000 +1 hr Dose Equivalent profiles within 1' around the CPS.

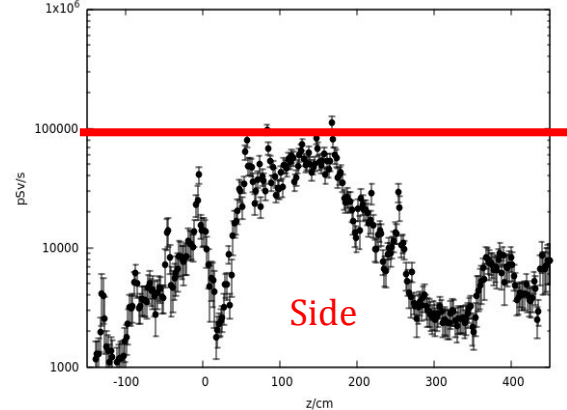
1 Hr Dose Eq downstr. CPS,  $370 < z/\text{cm} < 400$   $|x/\text{cm}| < 20$   $B = .24/.25/.22\text{T}$  CPSKPTCELL080822T



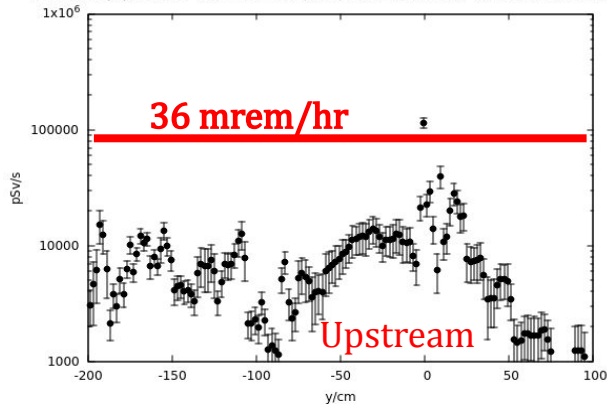
1 Hr Dose Eq top CPS,  $70 < y/\text{cm} < 100$   $|x/\text{cm}| < 20$   $B = .24/.25/.22\text{T}$  CPSKPTCELL080822TRA :



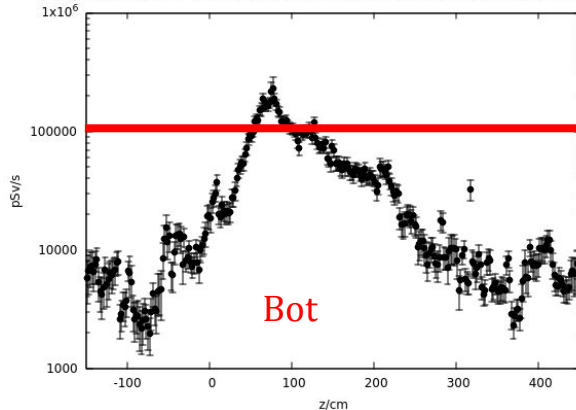
1 Hr Dose Eq side CPS,  $70 < x/\text{cm} < 100$   $|y/\text{cm}| < 20$   $B = .24/.25/.22\text{T}$  CPSKPTCELL080822TRA :



1 Hr Dose Eq upstr. CPS,  $-100 < z/\text{cm} < -70$   $|x/\text{cm}| < 20$   $B = .24/.25/.22\text{T}$  CPSKPTCELL080822TRJ



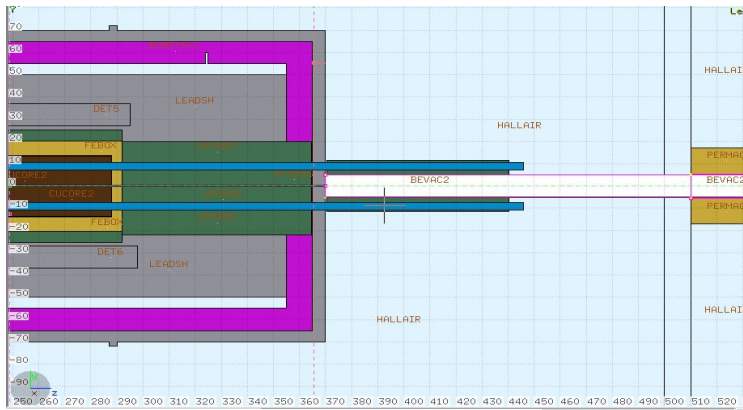
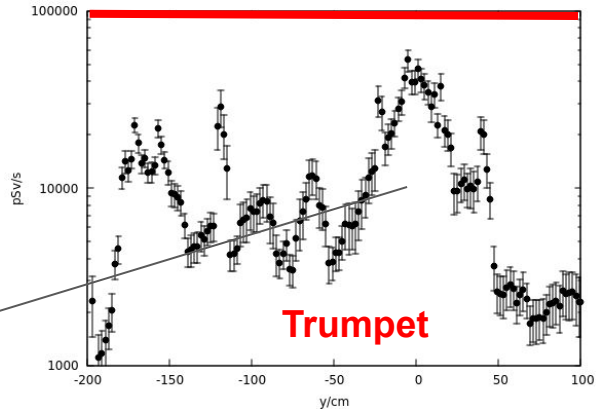
1 Hr Dose Eq bott. CPS,  $-100 < y/\text{cm} < -70$   $|x/\text{cm}| < 20$   $B = .24/.25/.22\text{T}$  CPSKPTCELL080822TRA



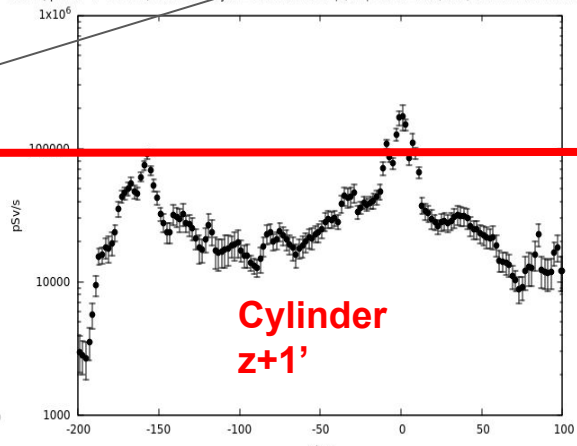
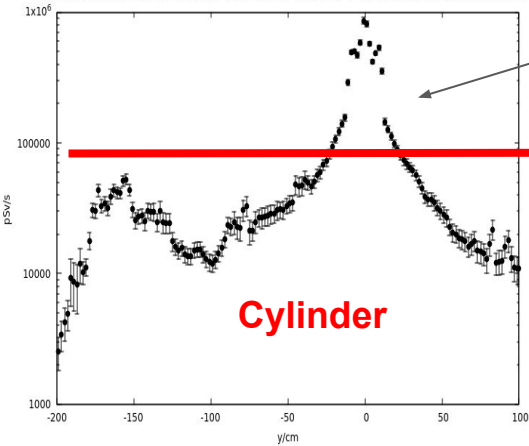
- Activation at the downstream side is low.
- Service lines may be placed at the CPS exit.

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

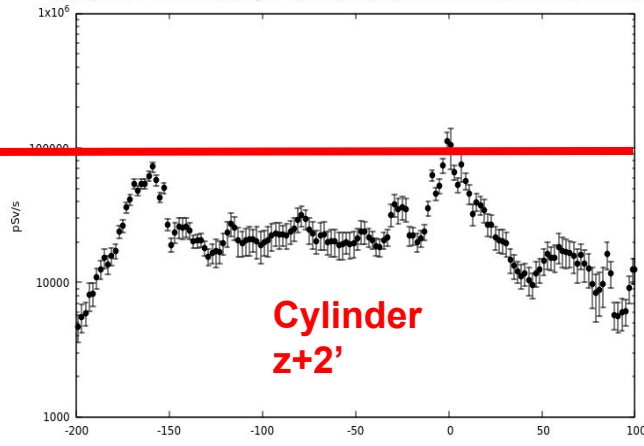
1 Hr Dose Eq downstr. CPS, 370<z/cm<400 |x/cm|<20 B=.24/.25/.22T CPSKPTCELL080822Tf



DoseEQ profile-0' 370<z/cm<400 dx dy dz = 0.05\*0.05\*0.2 |X/cm|<20 B=0.24/0.25/0.22T CPSKPTCELL080822 23 DoseEQ profile -1' : 400<z/cm<430 dx dy dz = 0.05\*0.05\*0.2 |X/cm|<20 B=0.24/0.25/0.22T CPSKPTCELL08



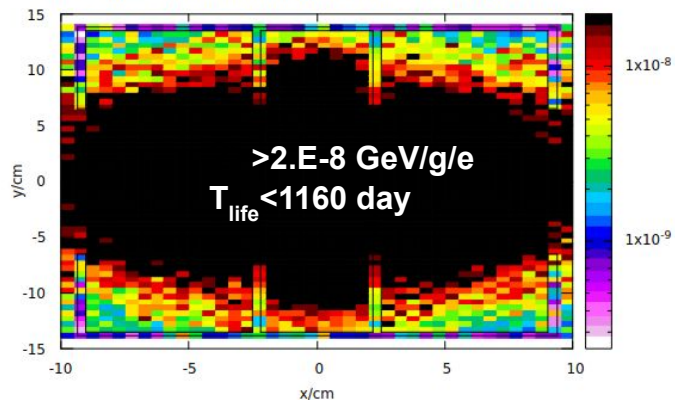
DoseEQ profile-2' : 420<z/cm<450 dx dy dz = 0.05\*0.05\*0.2 |X/cm|<20 B=0.24/0.25/0.22T CPSKPTCELL080822 23



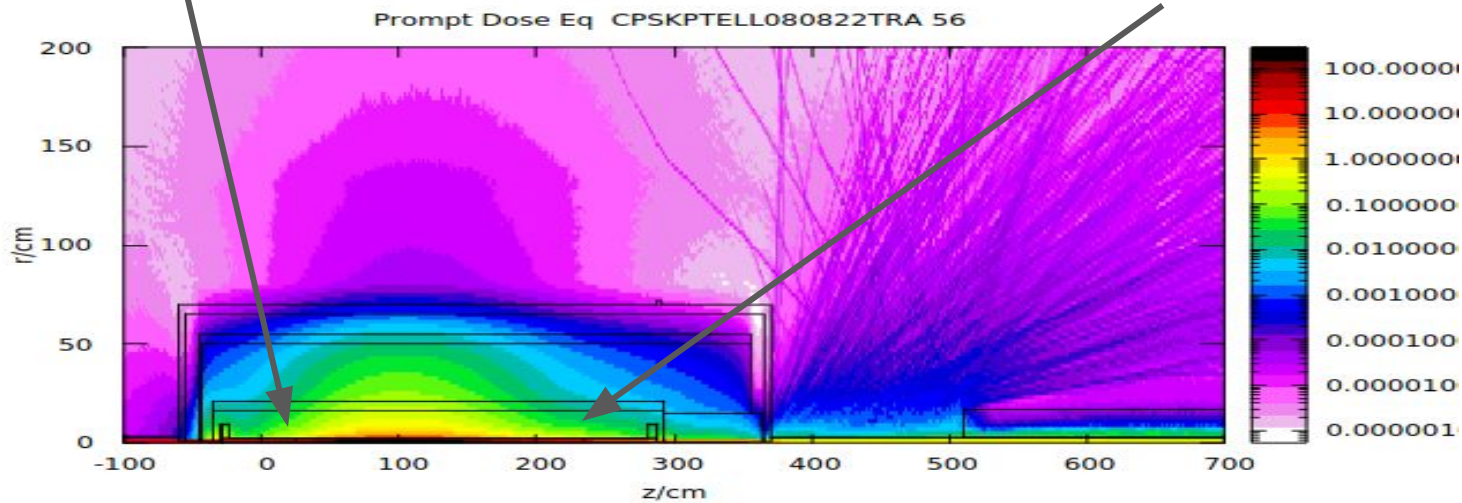
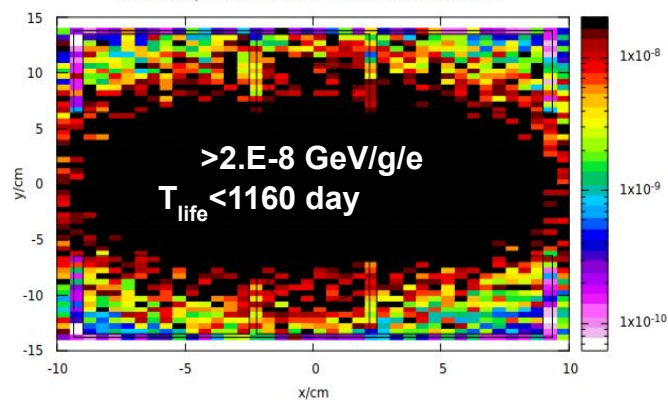


# Latest CPS model. Coil Insulation lifetime (Kapton 1.E+7 Gy) and Prompt Radiation

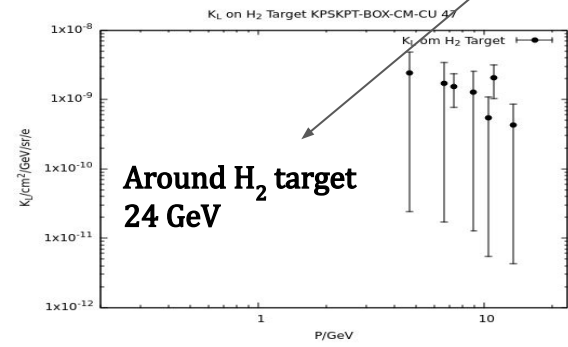
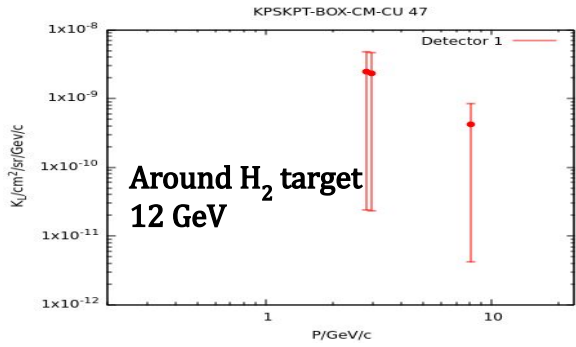
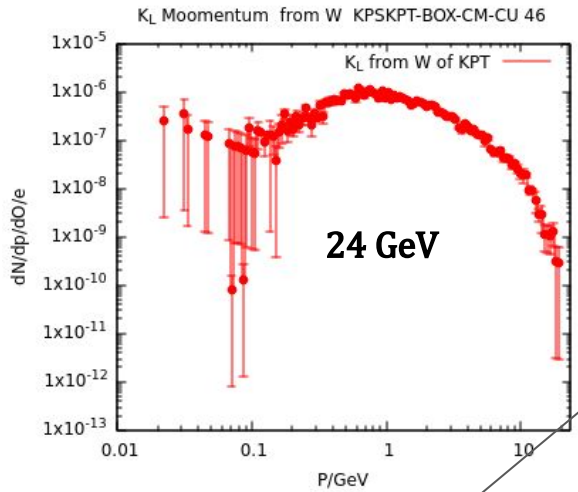
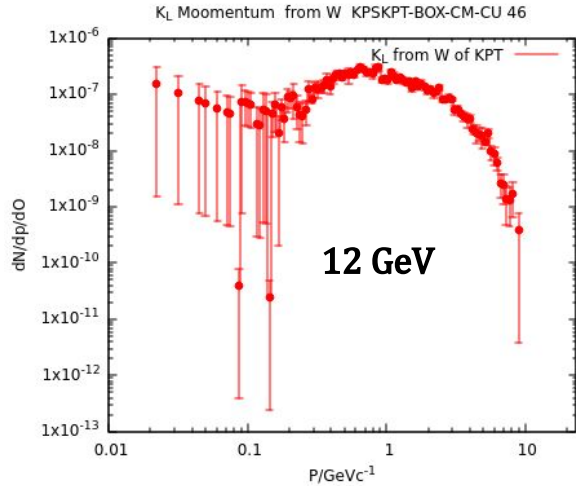
COIL 22 <z/cm<25 DOSE [GeV/g/e] Black=2.E-8 [] CPSKPTTELL080822TRA 28



COIL 234 <z/cm<237 Black=2.E-8 CPSKPTTELL080822TRA 29



# 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<sub>2</sub>
- Integral Under P-spectrum at 24 GeV

$$S \sim 1.E-9 [K_L/e/GeVc^{-1}] * 10 [GeVc^{-1}] = 1.E-8 [K_L/e]$$

- Counting rate

$$dK_L/dt = S * d\epsilon^-/dt = 1.E-8 [K_L/e] * 3.E+13 [e/s] * (6/20)^2 = \sim 3.E+4 [K_L/s].$$

# 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

$$\text{box}(x:X,y:Y,z:Z) = \text{box}(-16:16,-20.4:20.4,-35:292)$$

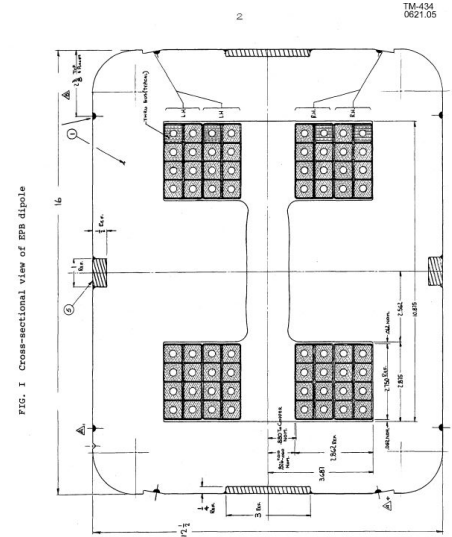
2. include WCu shield as a difference of two box(x:X,y:Y,z:Z):

$$\text{WCu Shield} = \text{box}(-21:21,-25:25,-40:355) - \text{box}(-16:16,-20.4:20.4,-35:292)$$

$$\text{Lead Shield} = \text{box}(-50:50,-50:50,-44:356) - \text{box}(-21:21,-25:25,-40:355)$$

$$\text{Bor-Polyeth} = \text{box}(-65:65,-65:65,-55:365) - \text{box}(-50:50,-50:50,-44:356)$$

$$\text{Lead....Skin} = \text{box}(-70:70,-70:70,-60:370) - \text{box}(-65:65,-65:65,-55:365)$$



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

