PREX Dump configuration

Ciprian Gal
UVa

Radiation - entire run values

	HRS detector				Under detector			
	Total NEIL/cm2	uncert	Ratio to P1	uncert	Total NEIL/cm2	uncert	Ratio to P1	uncert
PREX1 (ERR dump)	4.60E+10	1.79E+09	1.00	0.06	7.43E+10	4.92E+09	1.00	0.09
PREX1 (actual dump)	4.05E+10	1.68E+09	0.88	0.05	7.78E+10	5.39E+09	1.05	0.10
PREX2 ERR	4.96E+09	6.72E+08	0.11	0.02	1.09E+10	2.61E+09	0.15	0.04
PREX2 current	5.77E+10	5.69E+09	1.25	0.13	7.60E+10	1.85E+10	1.02	0.26
P2 with P1pipe	2.12E+10	3.38E+09	0.46	0.08	4.39E+10	1.31E+10	0.59	0.18
P2 current+4in	4.46E+10	4.64E+09	0.97	0.11	6.68E+10	1.45E+10	0.90	0.20
P2 current+Conc	2.38E+10	3.44E+09	0.52	0.08	2.76E+10	1.04E+10	0.37	0.14
P2 current+ (Conc*2)	1.54E+10	1.81E+09	0.33	0.04	1.72E+10	4.07E+09	0.23	0.06
P2 current+ (Conc*0.5)	2.70E+10	2.63E+09	0.59	0.06	2.40E+10	6.13E+09	0.32	0.09
P2 current+Poly	2.19E+10	3.09E+09	0.48	0.07	5.40E+10	1.59E+10	0.73	0.22
P2 current+4in+1ftCont	1.83E+10	2.84E+09	0.40	0.06	2.69E+10	7.95E+09	0.36	0.11
P2 current + donut shield	5.27E+10	5.61E+09	1.15	0.13	8.28E+10	1.98E+10	1.11	0.28
CREX ERR	6.73E+09	2.05E+09	0.15	0.04	1.31E+10	6.57E+09	0.18	0.09
C5 current	3.86E+10	7.80E+09	0.84	0.17	4.70E+10	1.96E+10	0.63	0.27
C5 current+4in	9.86E+09	2.61E+09	0.21	0.06	3.80E+10	2.11E+10	0.51	0.29
C5 P1pipe	7.31E+10	1.12E+10	1.59	0.25	1.06E+11	3.38E+10	1.43	0.47
C5 current+Conc	2.23E+10	5.78E+09	0.49	0.13	3.21E+10	1.65E+10	0.43	0.22
C5 current+(Conc*2)	1.73E+10	3.23E+09	0.38	0.07	2.68E+10	1.00E+10	0.36	0.14
C5 current+(Conc*0.5)	1.70E+10	3.35E+09	0.37	0.07	1.09E+10	5.20E+09	0.15	0.07
C5 current+Poly	1.86E+10	5.13E+09	0.40	0.11	1.40E+10	1.01E+10	0.19	0.14
C5 current+ 2Pipe septum	3.85E+10	8.70E+09	0.84	0.19	9.65E+10	3.52E+10	1.30	0.48
C5 current+ 4in+1ftConc	1.01E+10	3.28E+09	0.22	0.07	3.85E+10	2.35E+10	0.52	0.32
C5 current+2Pipe+donut shield	4.09E+10	7.86E+09	0.89	0.17	4.73E+10	2.41E+10	0.64	0.33

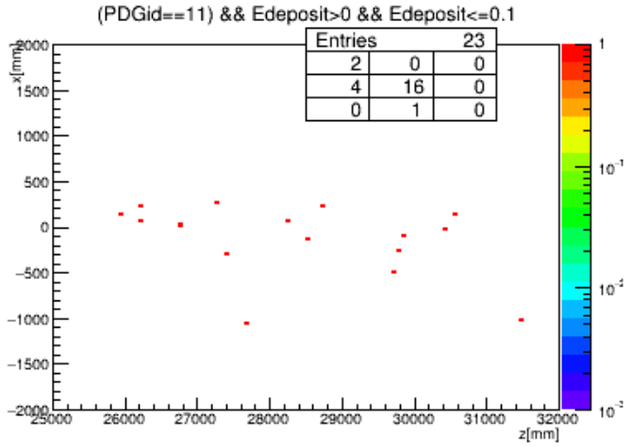
Area for HRS det: 4e5 cm^2
Area for Under det: 6e4 cm^2

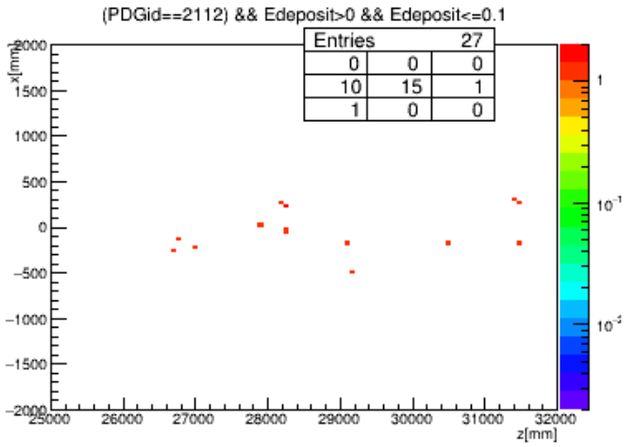
Todo list

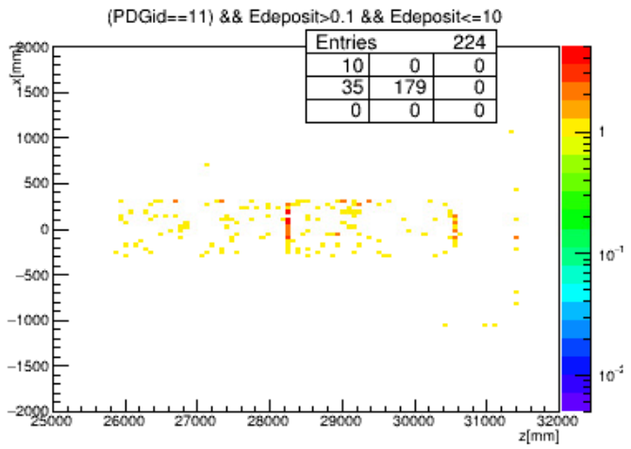
- More work is going to have to be done to optimize the shielding
- Sanghwa and I went over to the hall and we made some more measurement of the dimensions and locations of the electronics boxes on the HRS (fisheye picture and video at: https://goo.gl/photos/Q2RjKWvZrBsajLcCA)
  - More pictures on hallaweb: http://hallaweb.jlab.org/parity/prex/beamline/hrsPlatform/
- Maduka has sent us his geometry implementation: http://galileo.phys.virginia.edu/~mmk6qa/Geant4_simulations/
  - unfortunately they are coded in c++ source files but the information is very useful nonetheless

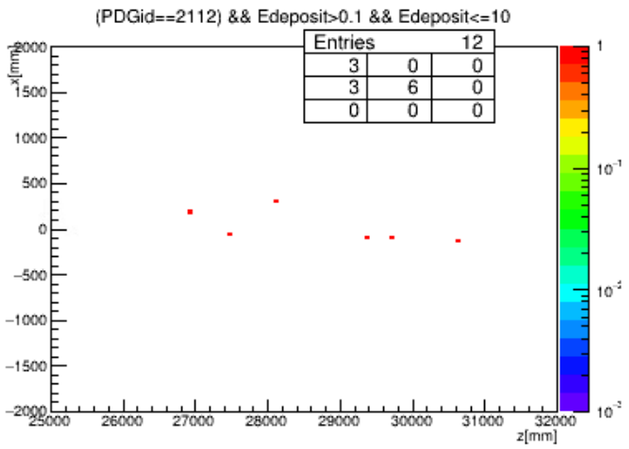
PREX2 - Under HRS detector

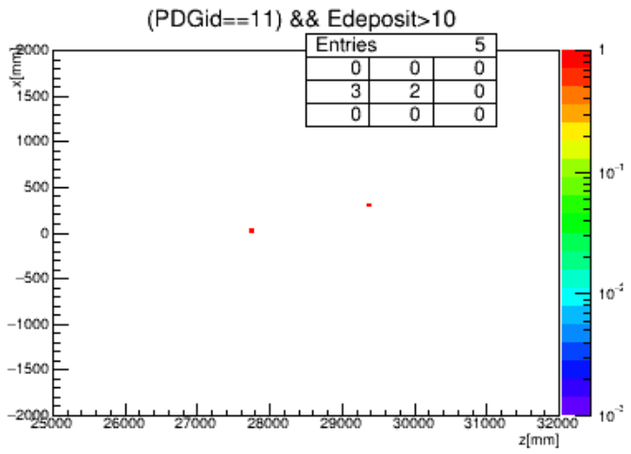
current setup

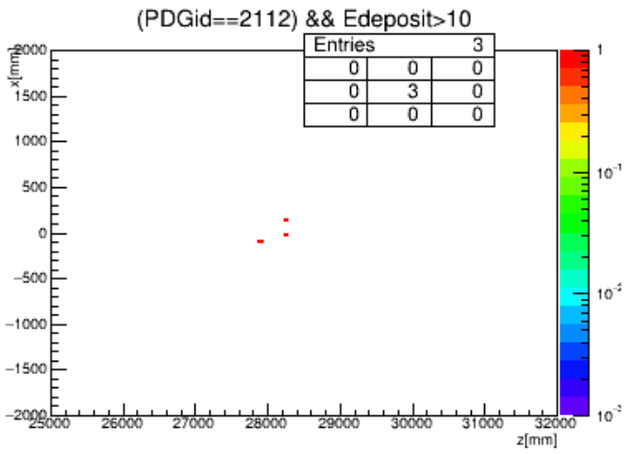




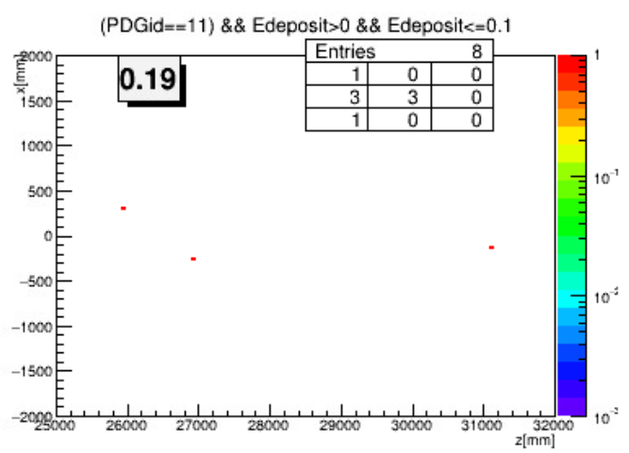


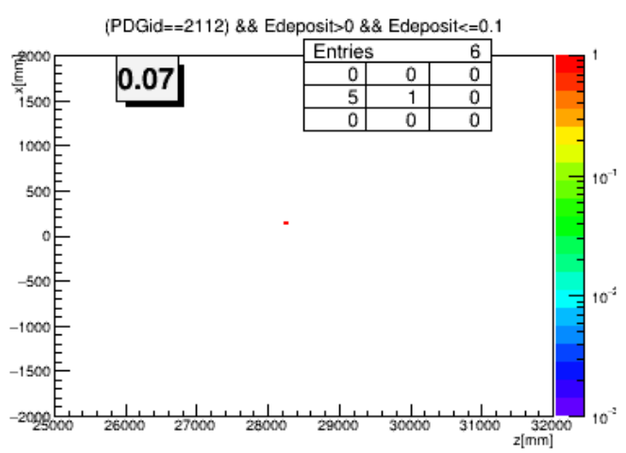


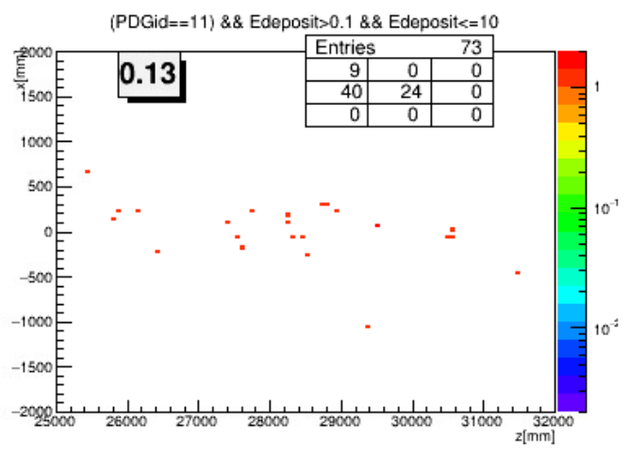


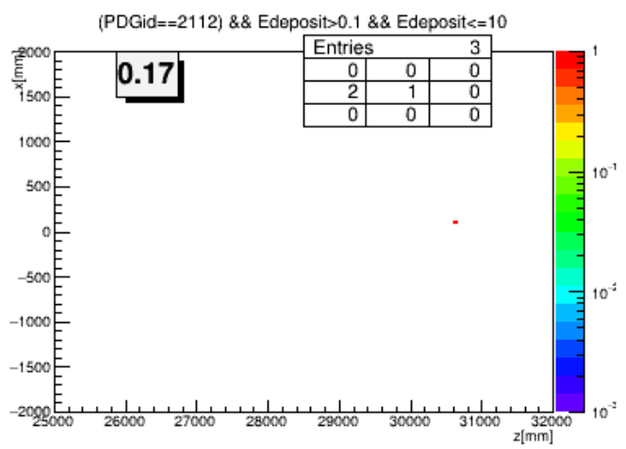


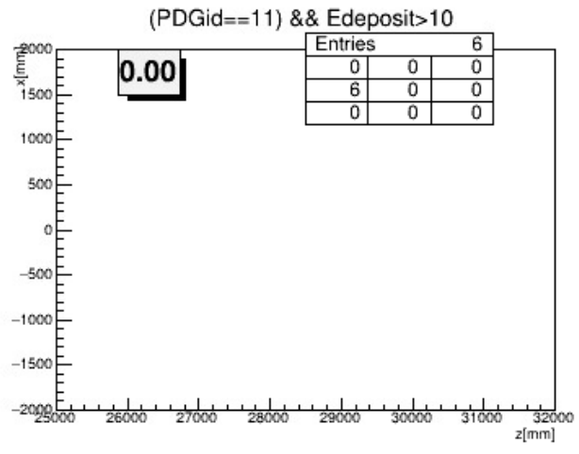
current setup + 1 ft Concrete

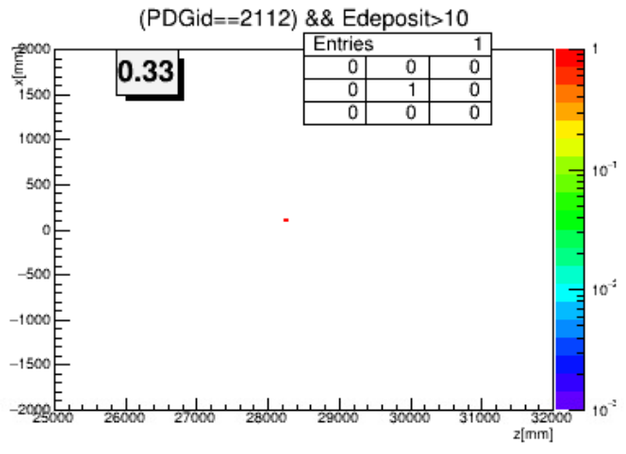






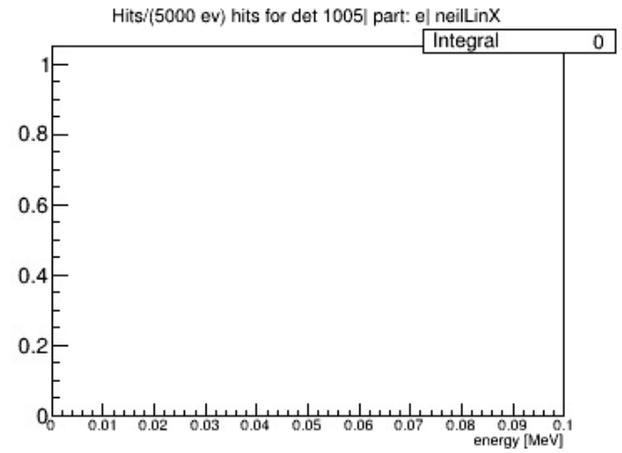


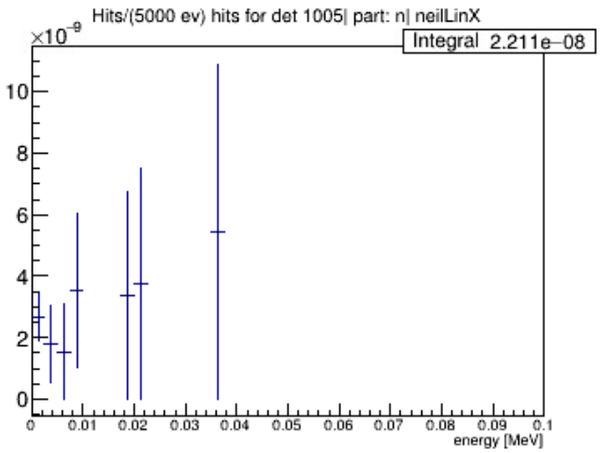


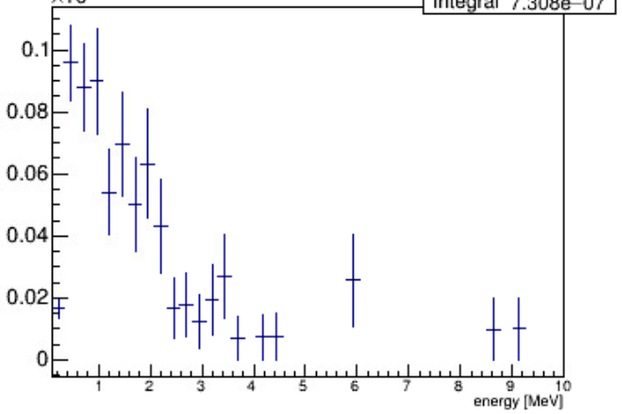


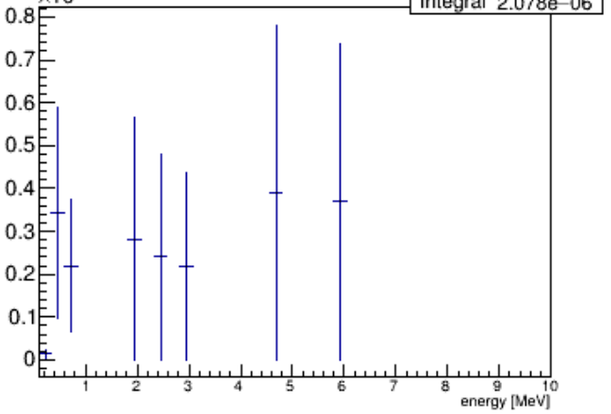
PREX2 - Under HRS detector

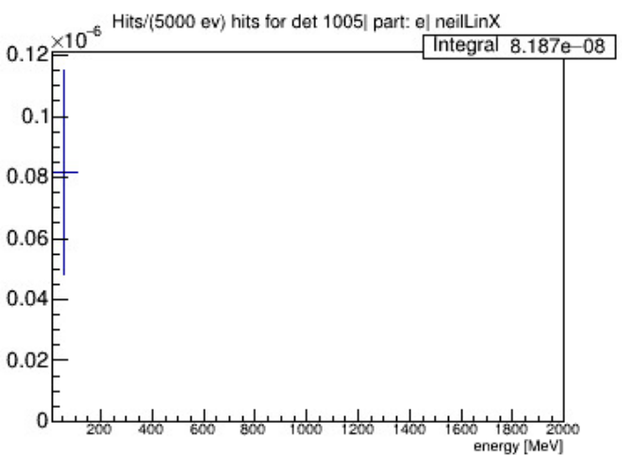
current setup

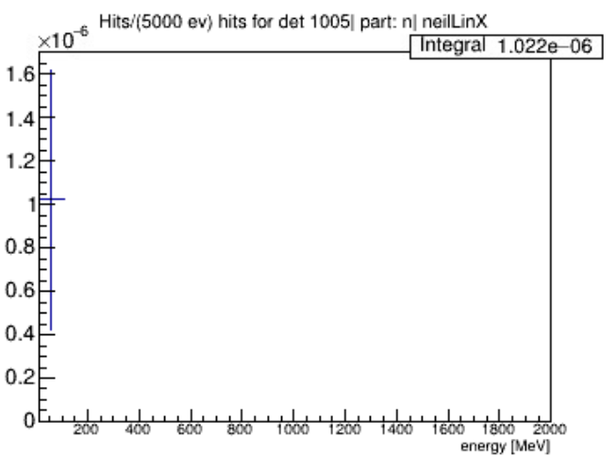




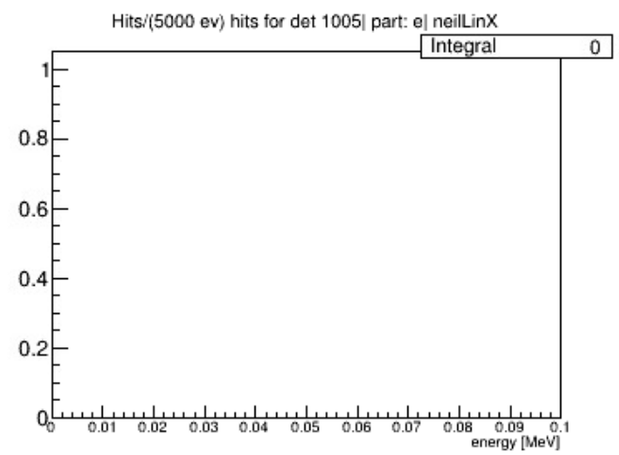


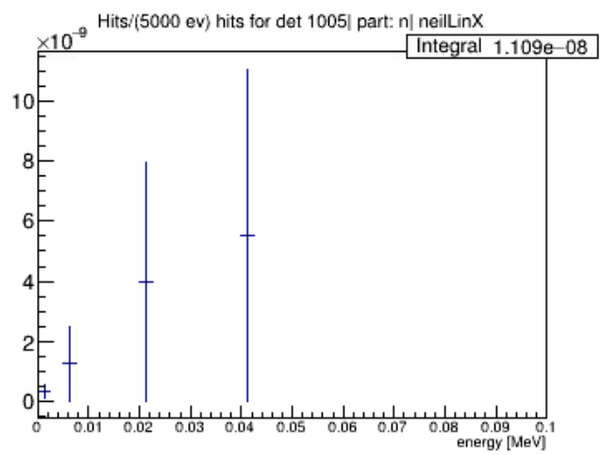


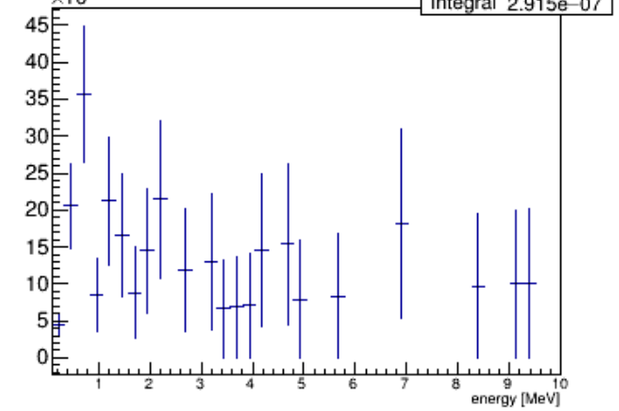


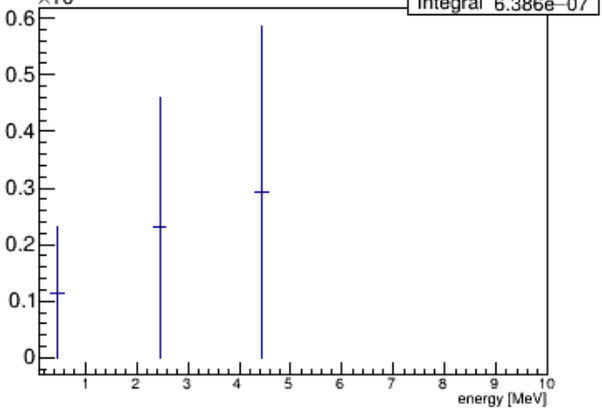


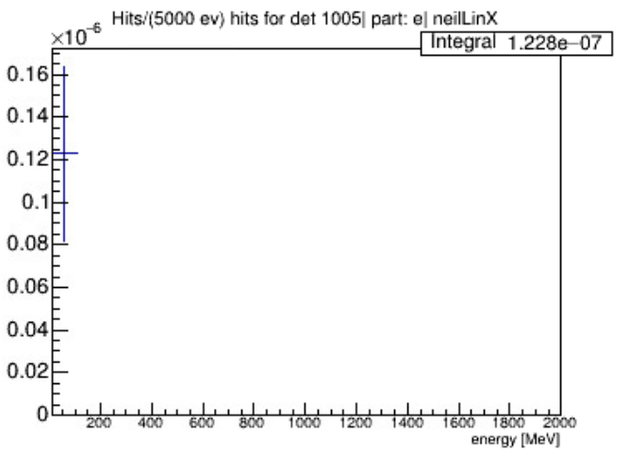
current setup + 1 ft Concrete

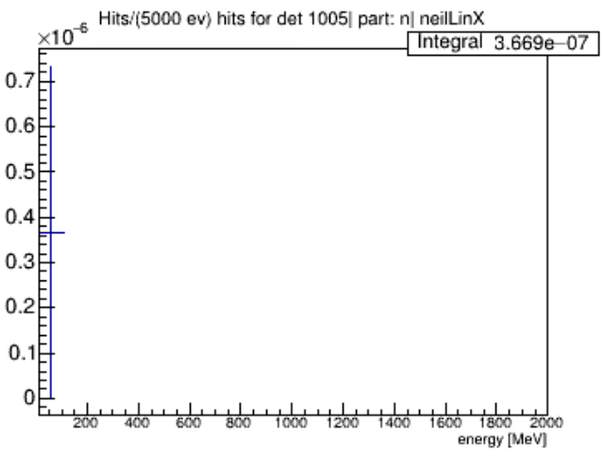






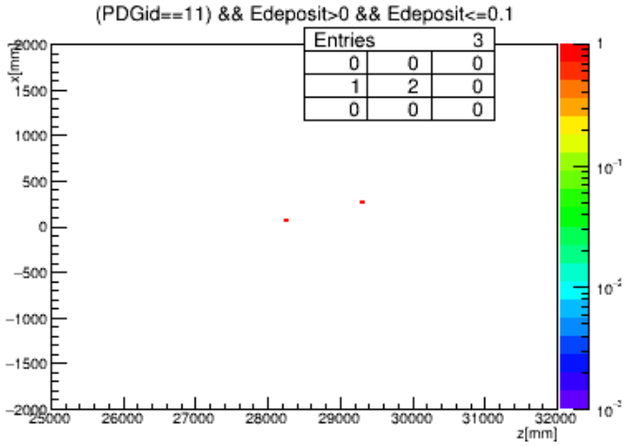


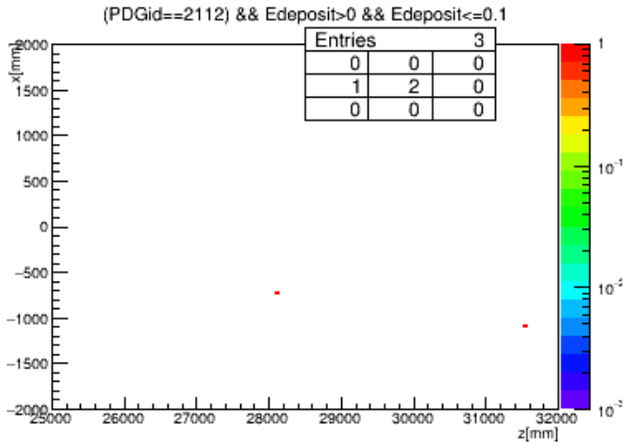


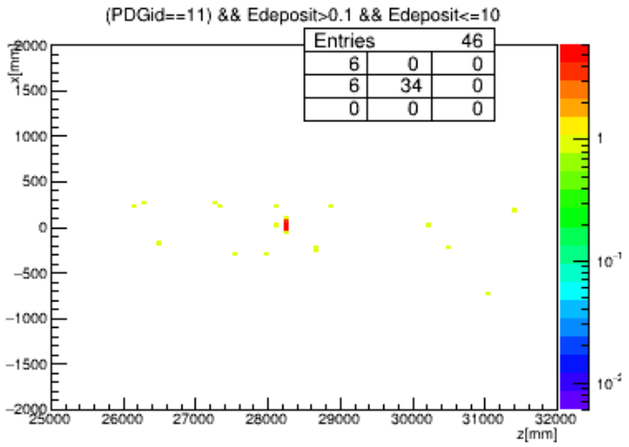


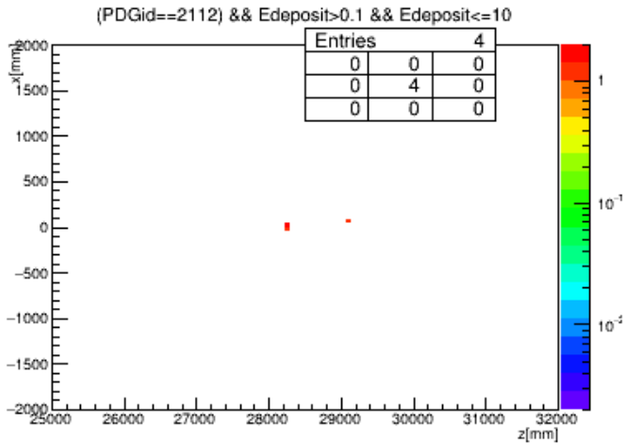
CREX - Under HRS detector

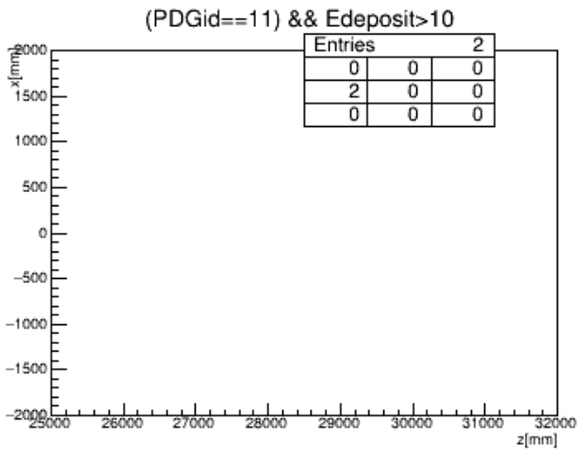
current setup

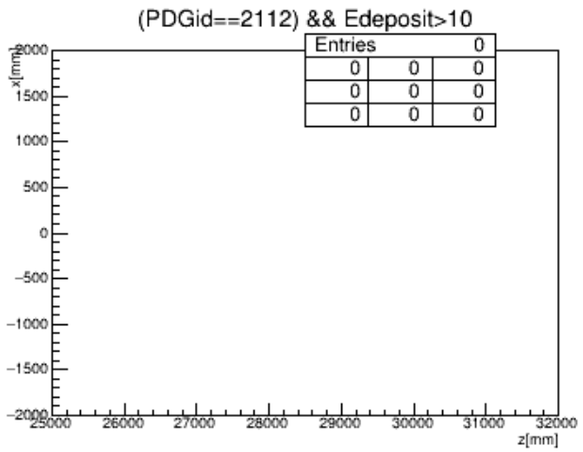




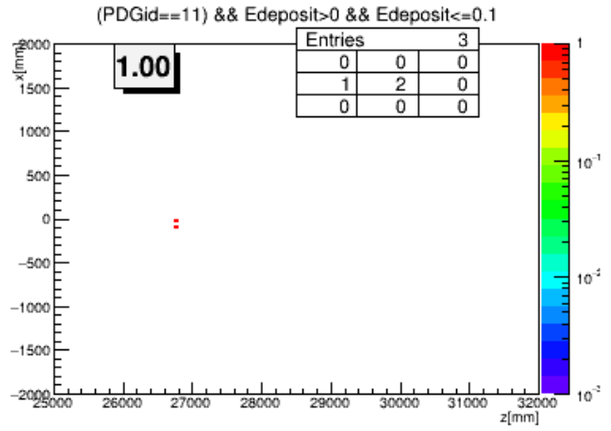


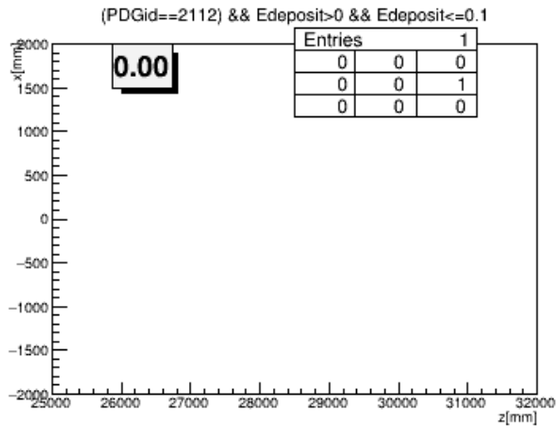


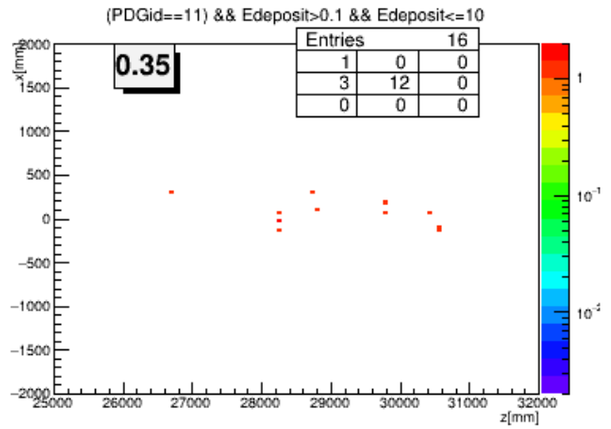


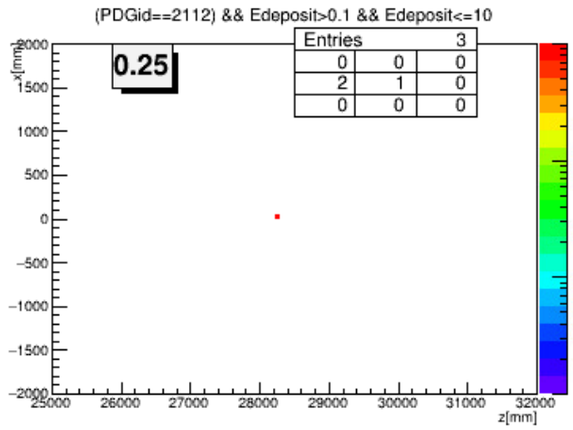


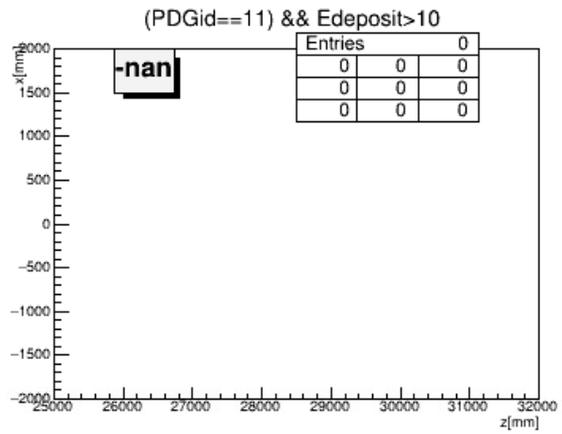
current setup + 1 ft Concrete

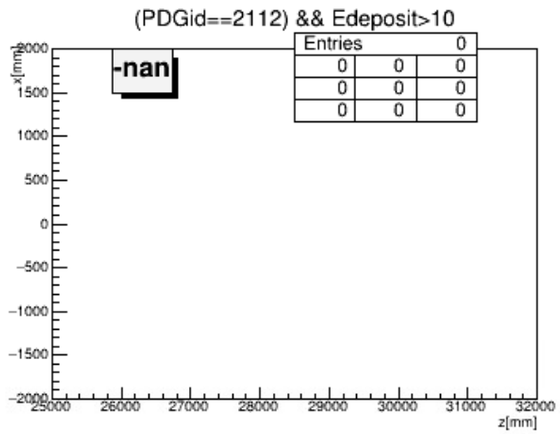






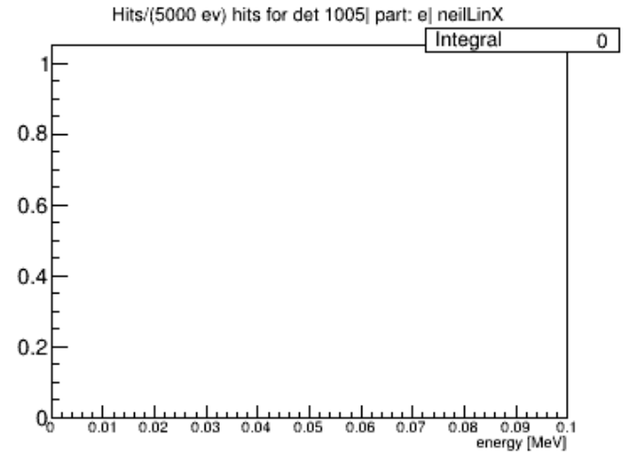


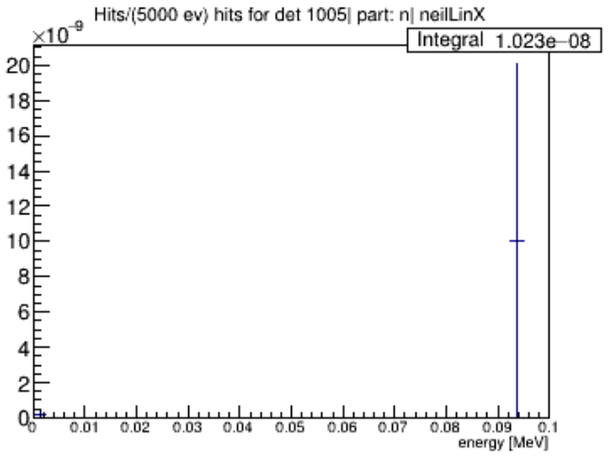


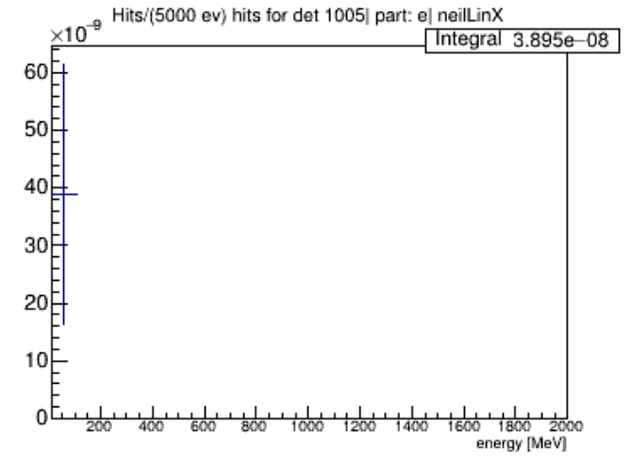


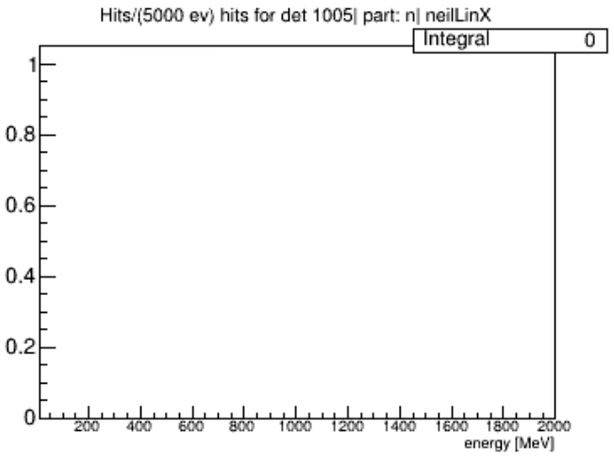
CREX - Under HRS detector

current setup

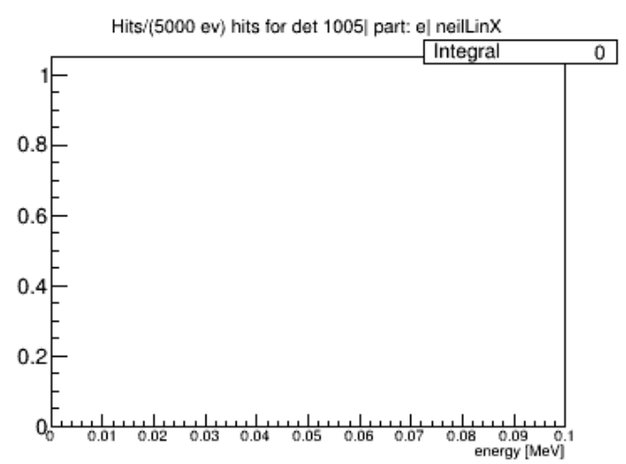


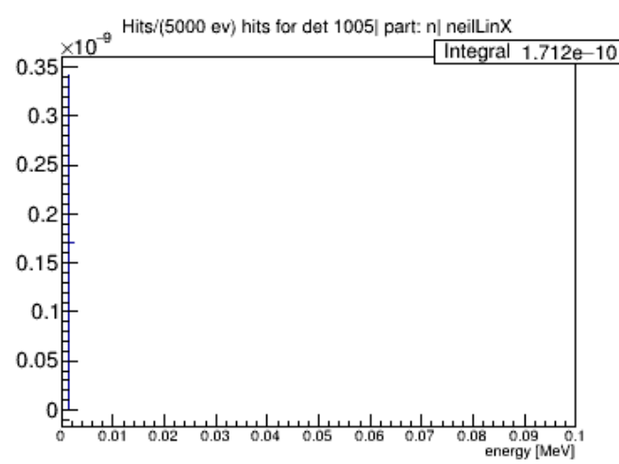


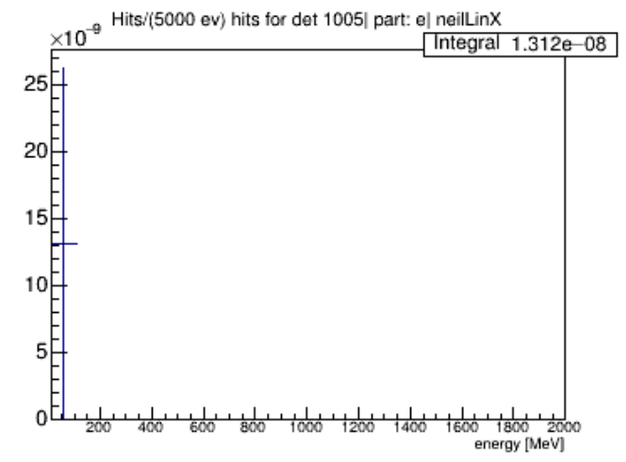


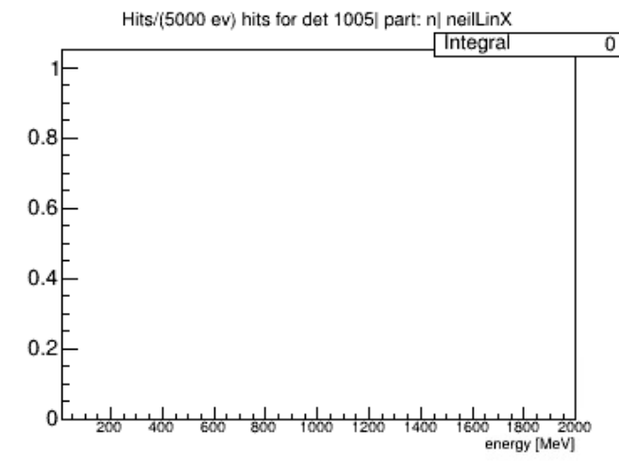


current setup + 4 in donut



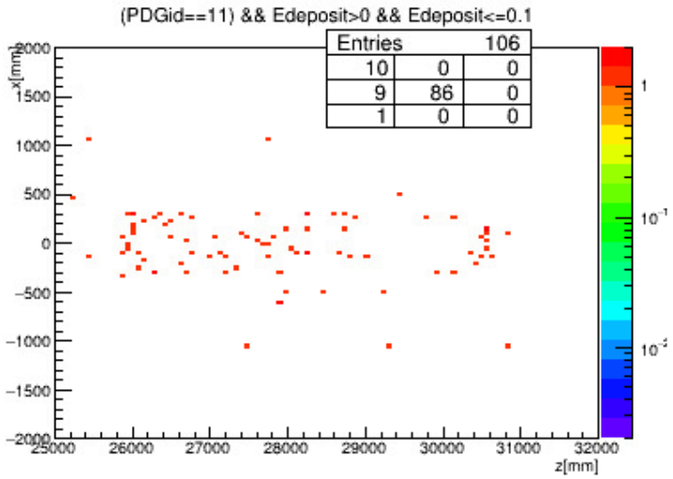




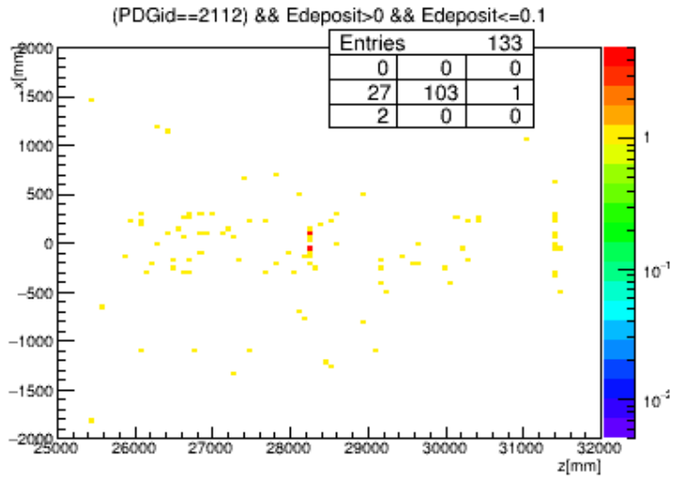


PREX2 - current dump

electrons



neutrons



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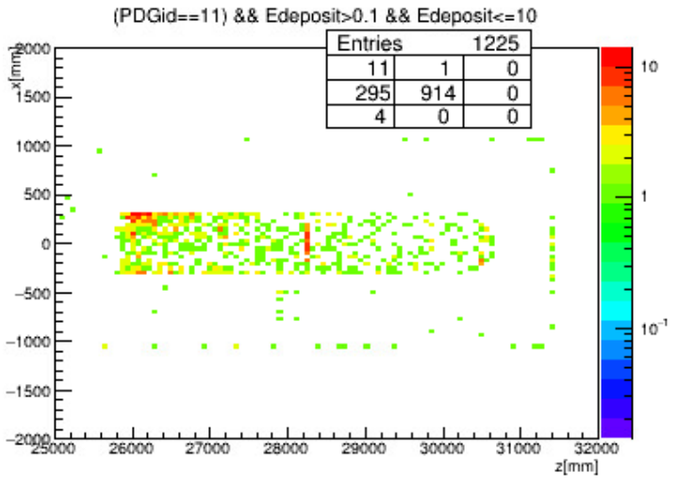

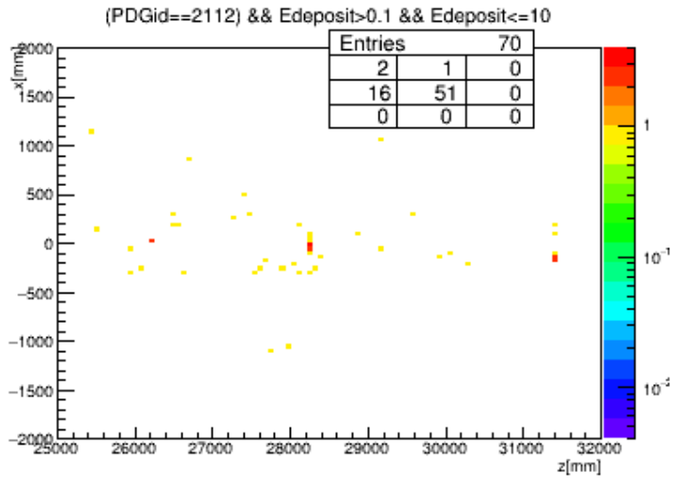

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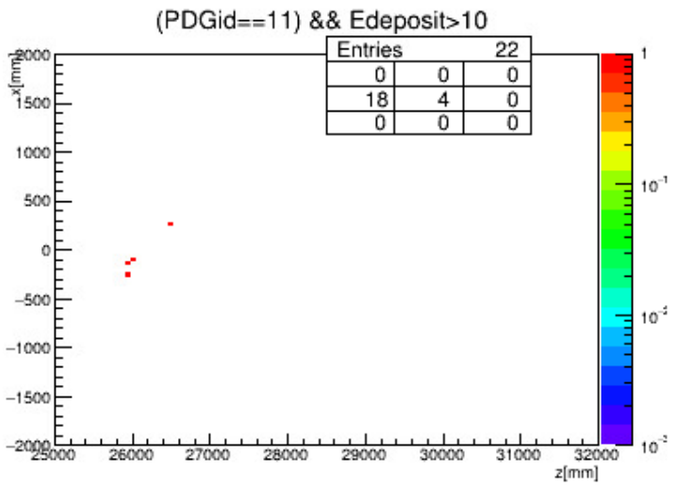
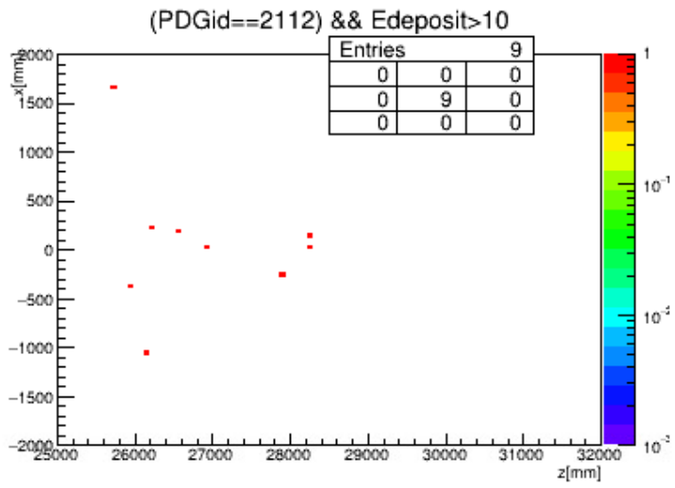
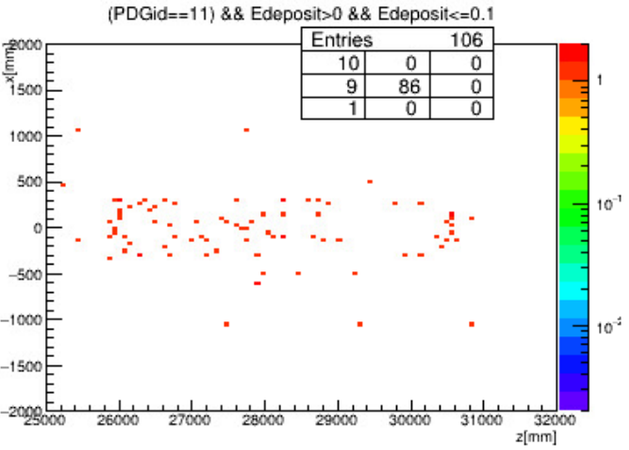


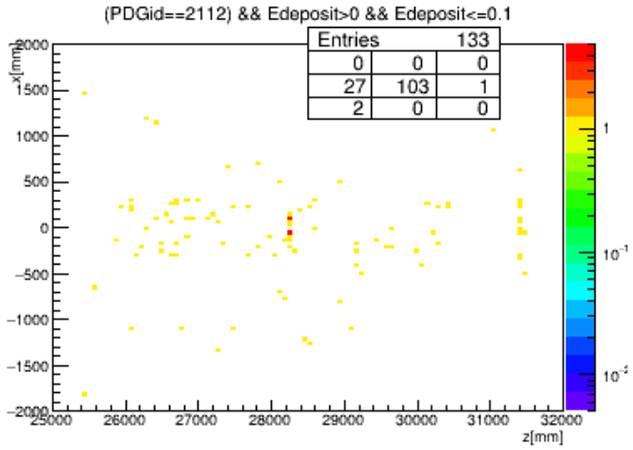


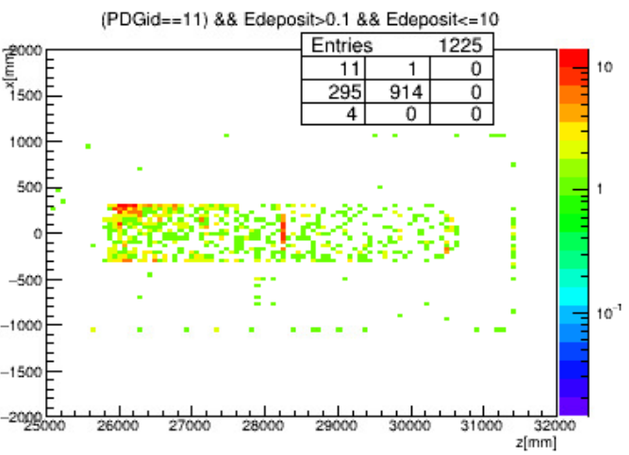
10<E MeV

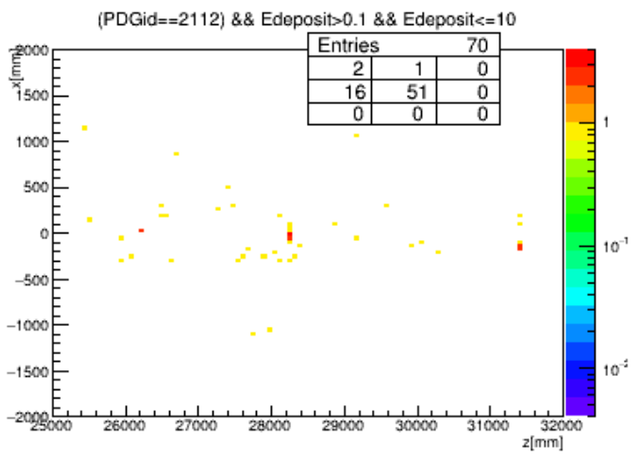
PREX2 - comparison

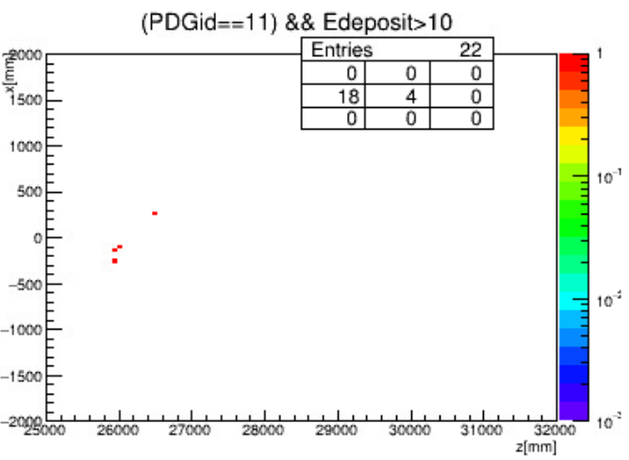
current setup

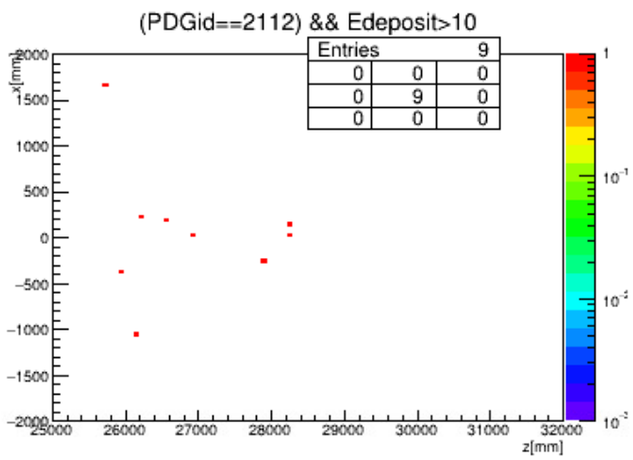




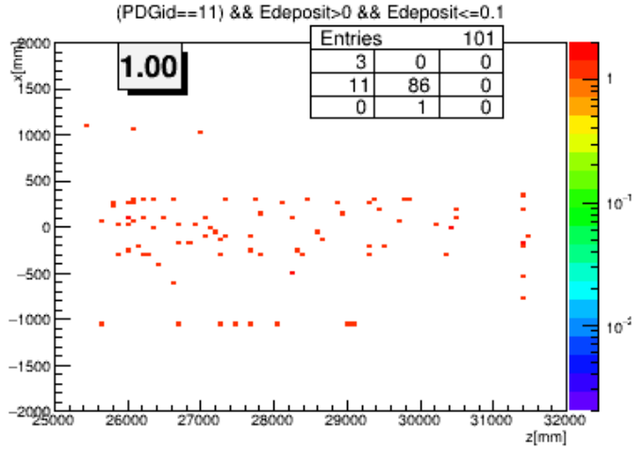


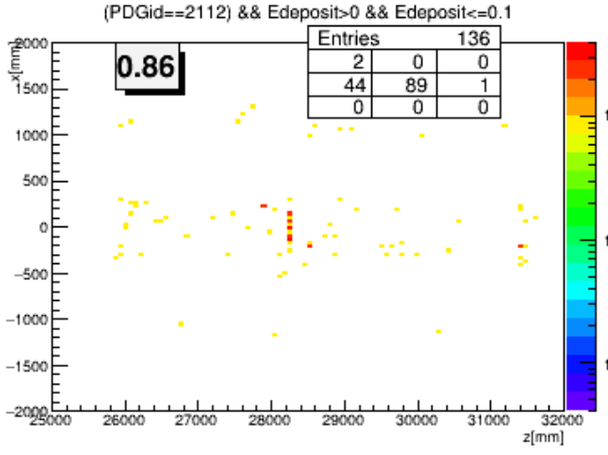


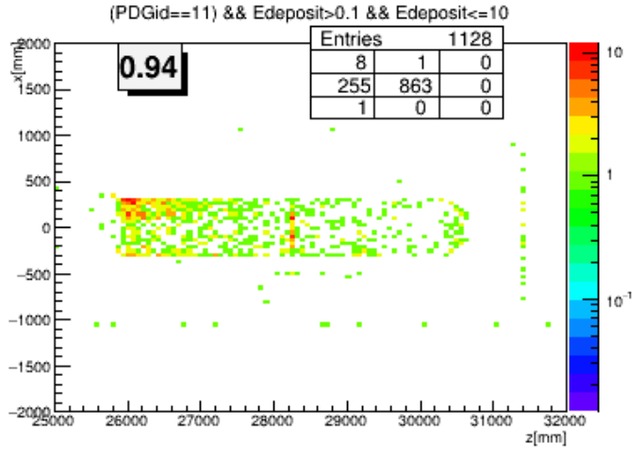


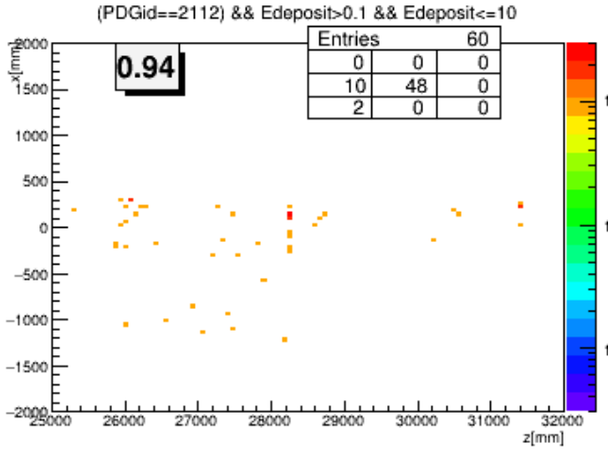


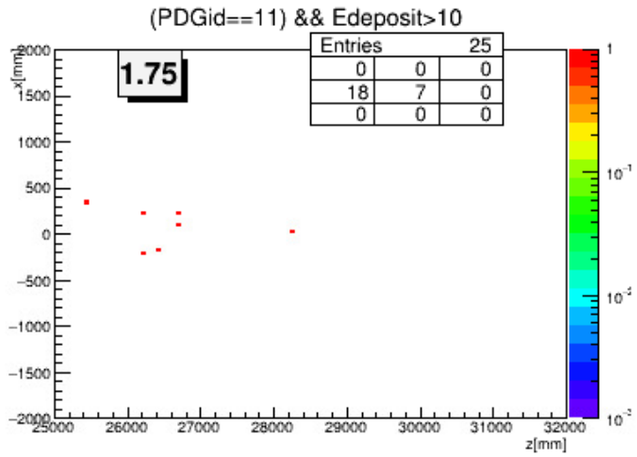
current setup + 4 in donut

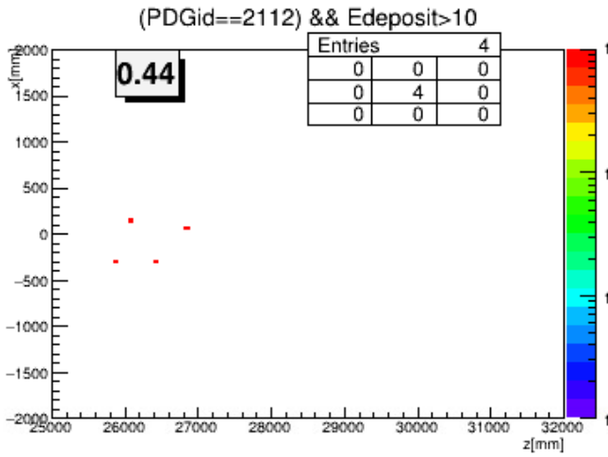






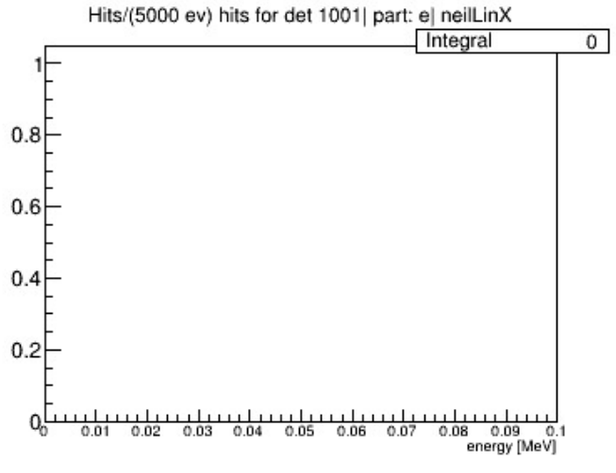


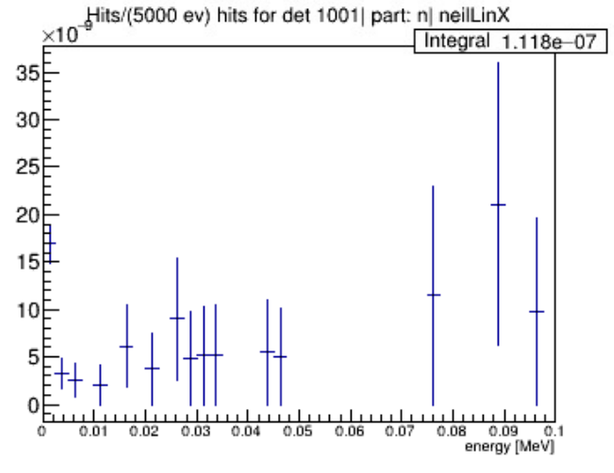


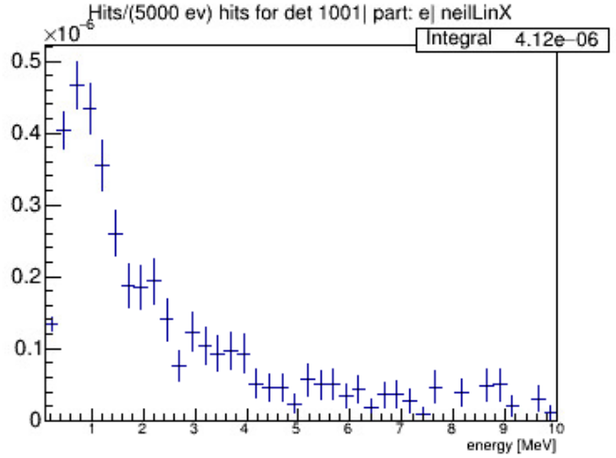


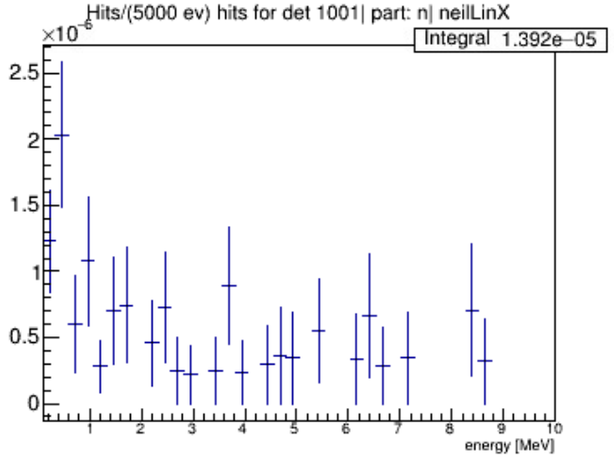
PREX2 - comparison

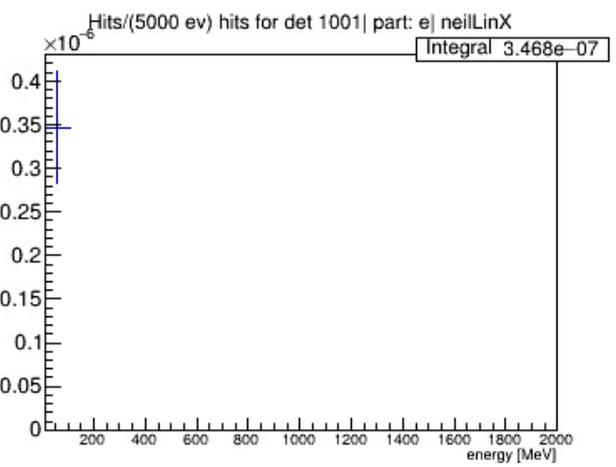
current setup

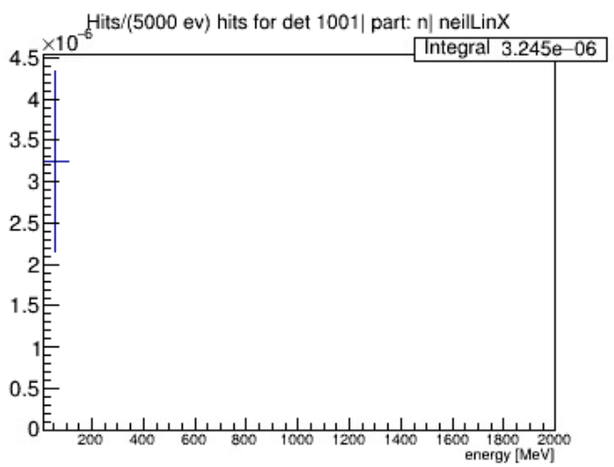




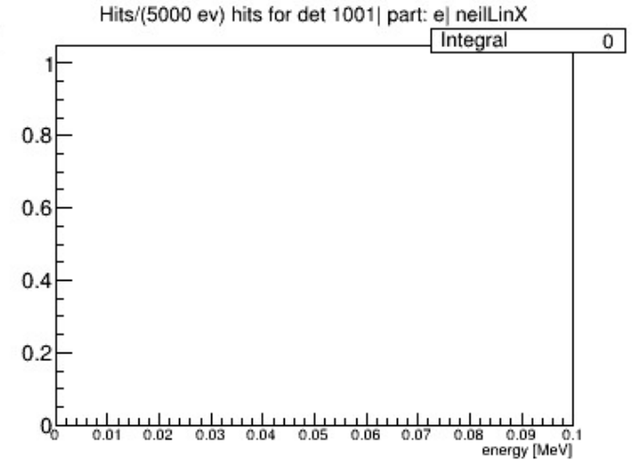


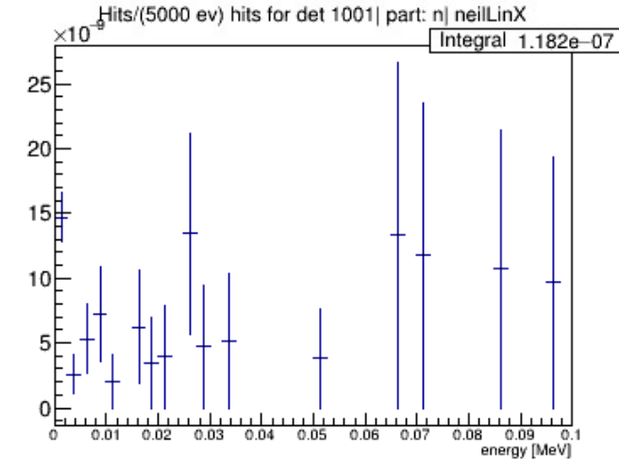


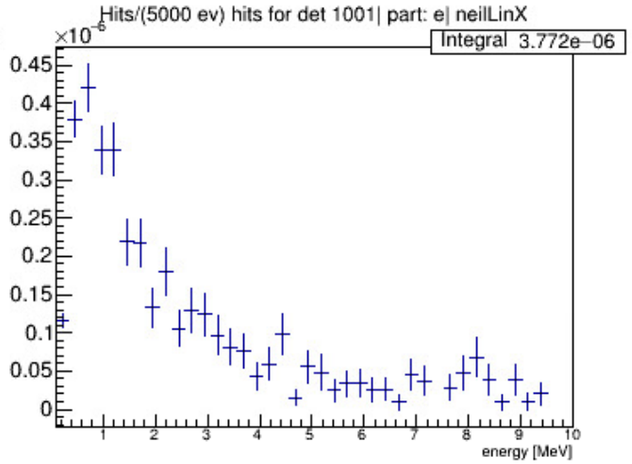


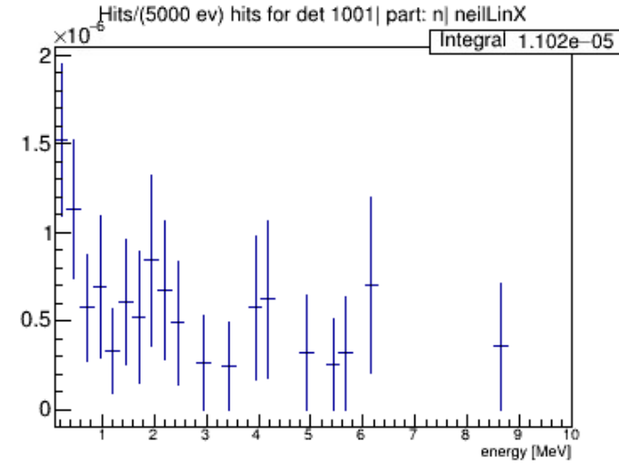


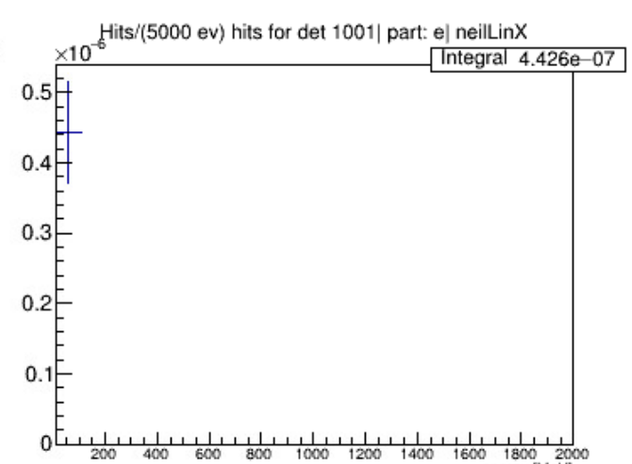
current setup + 4 in Donut

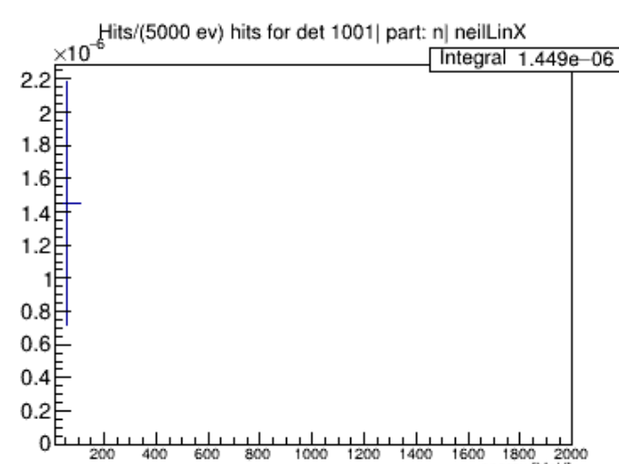






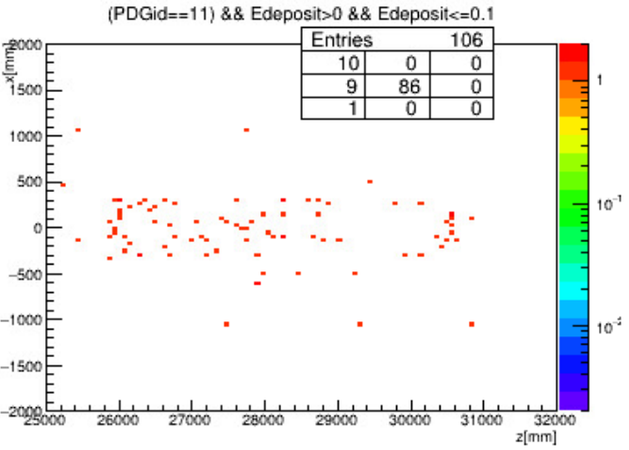


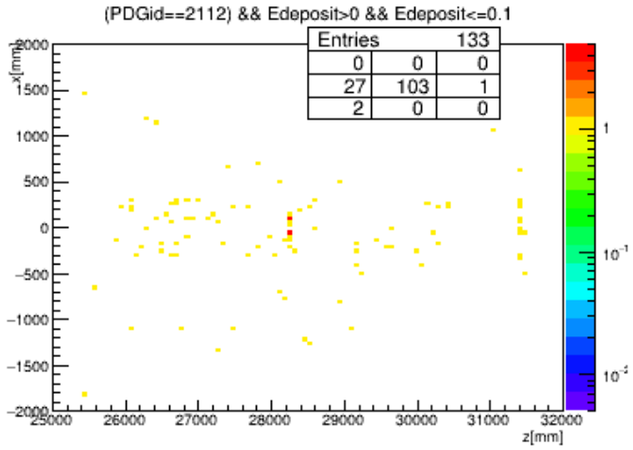


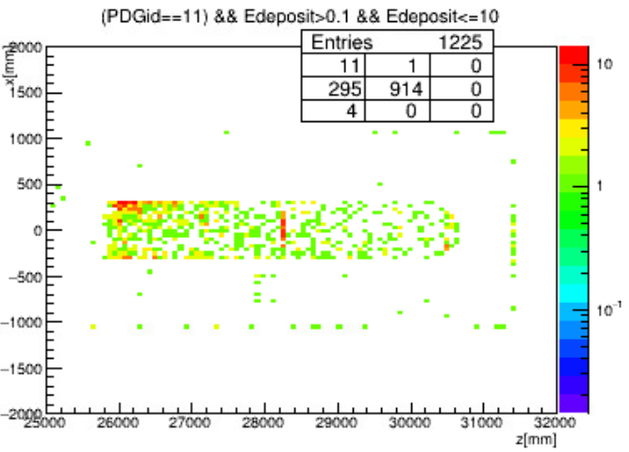


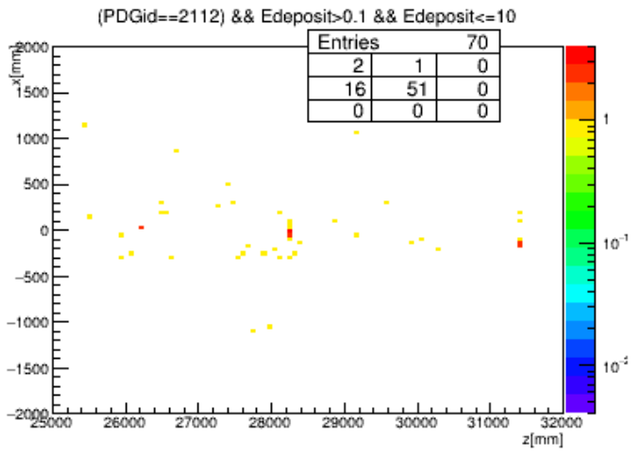
PREX2 - comparison

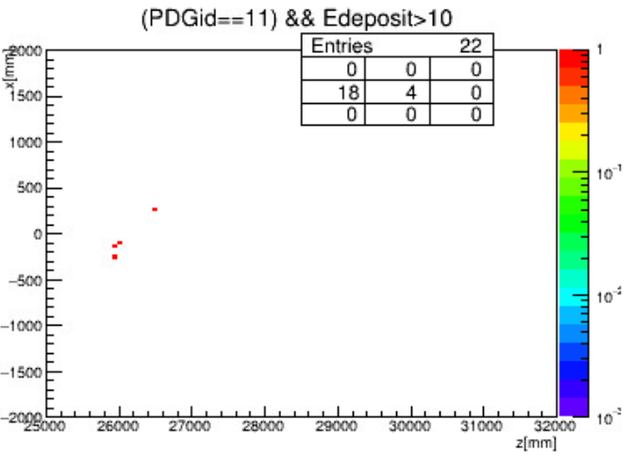
current setup

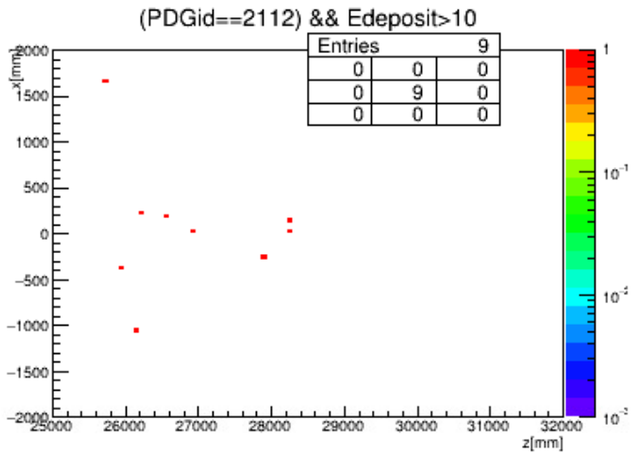




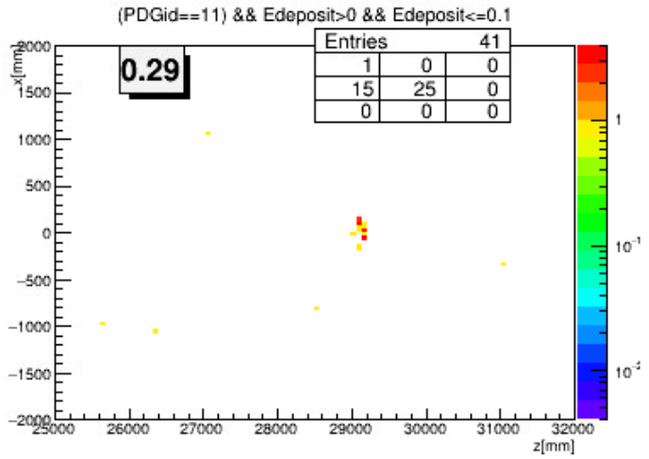


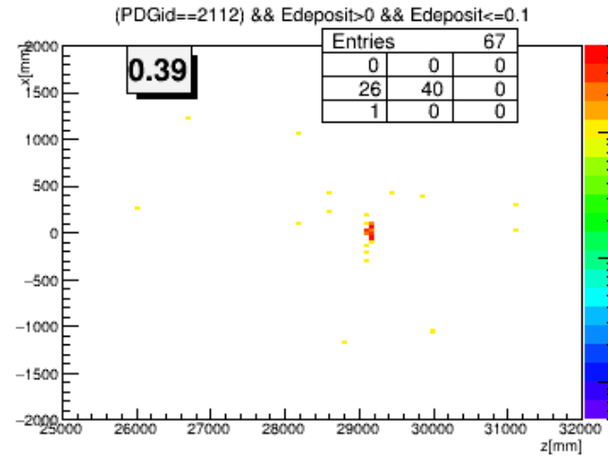


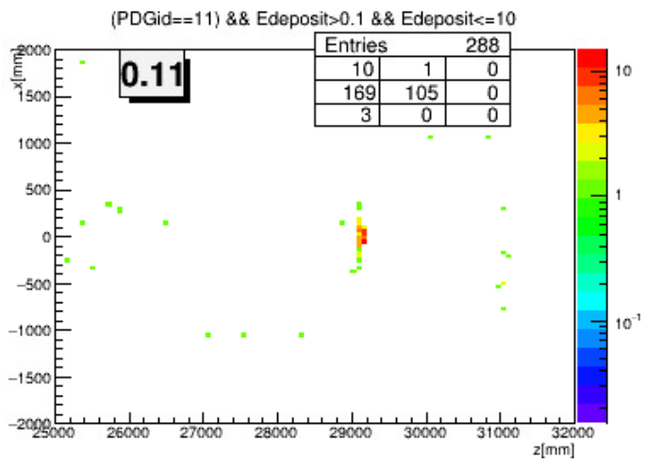


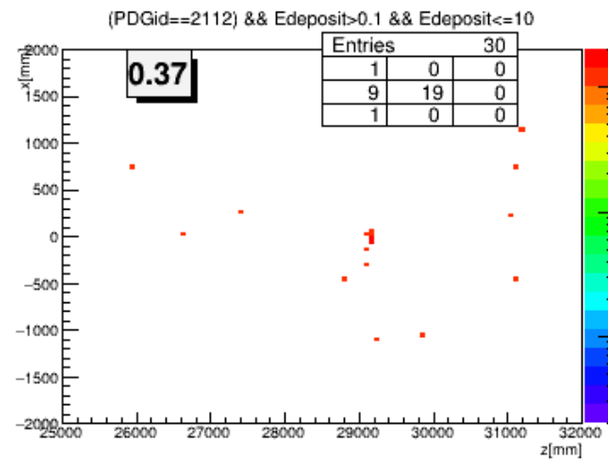


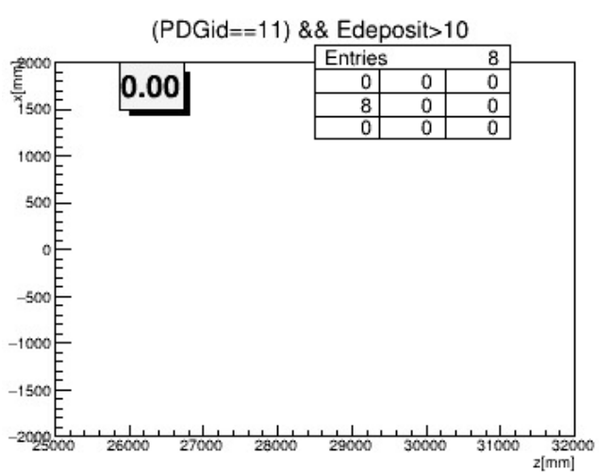
PREX1 dump configuration

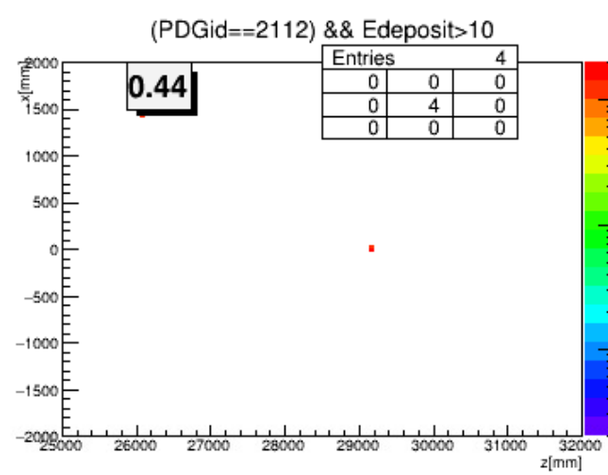






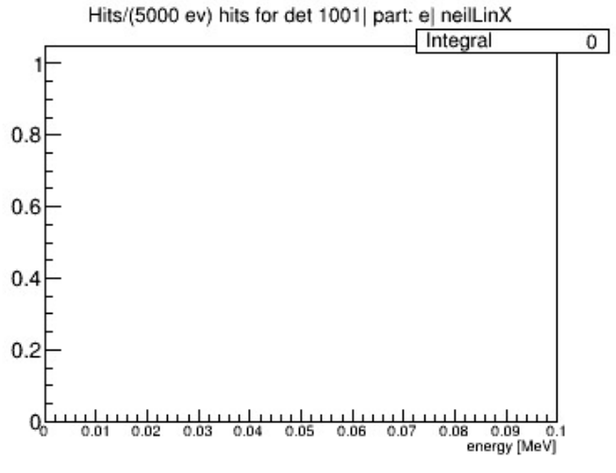


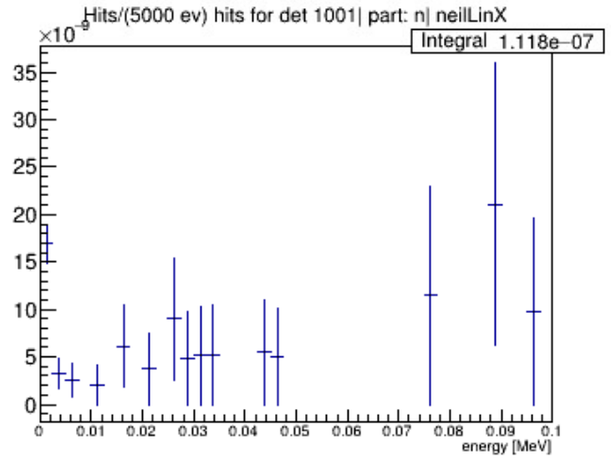


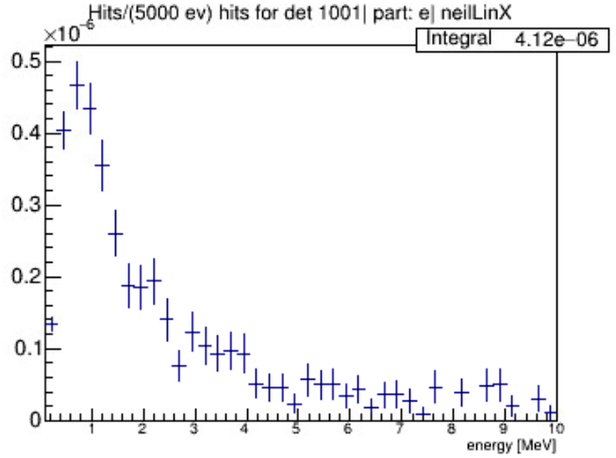


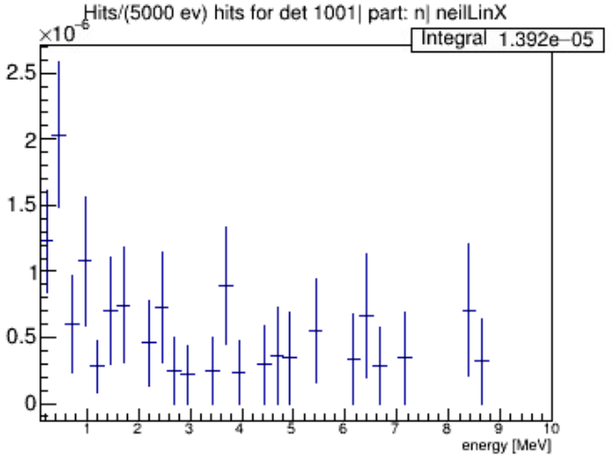
PREX2 - comparison

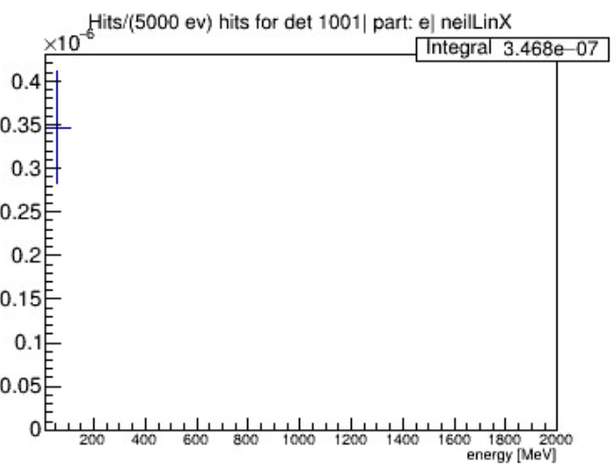
current setup

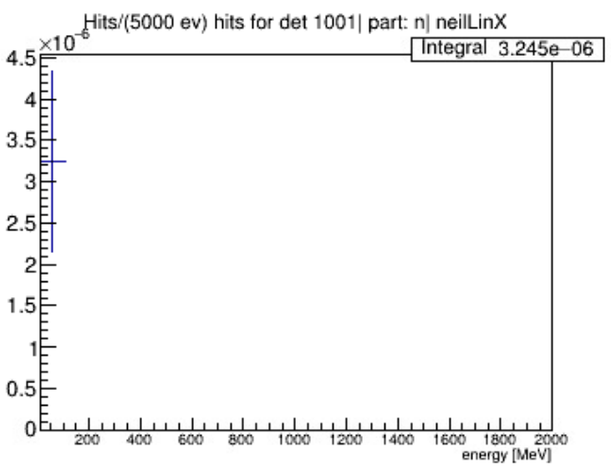




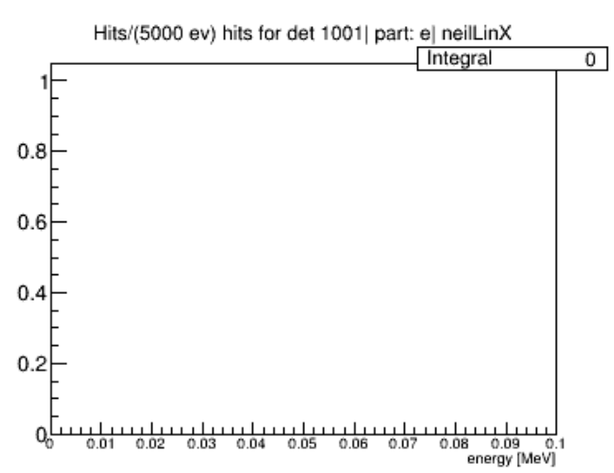


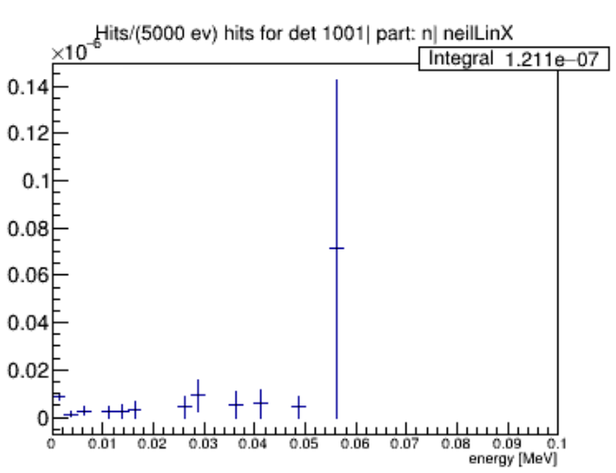


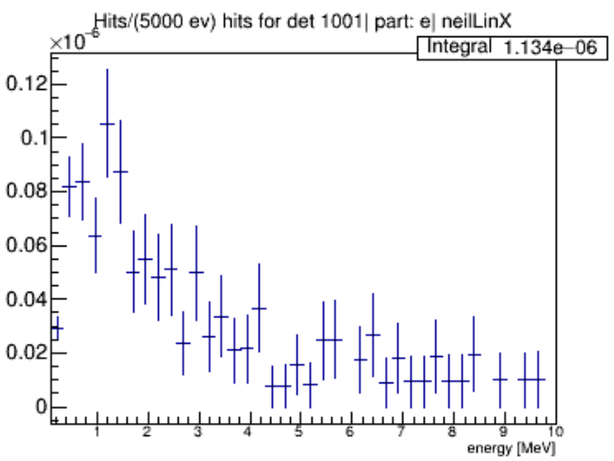


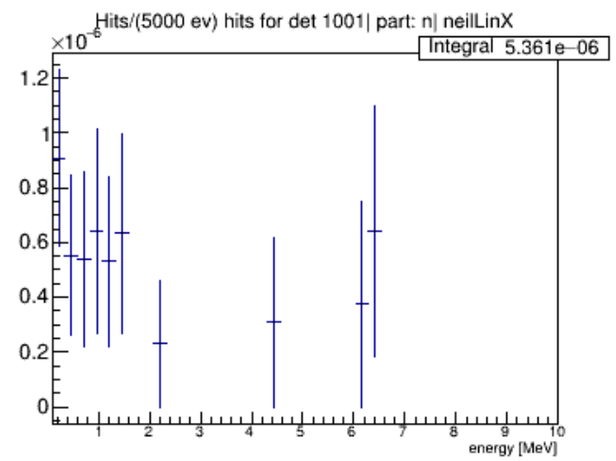


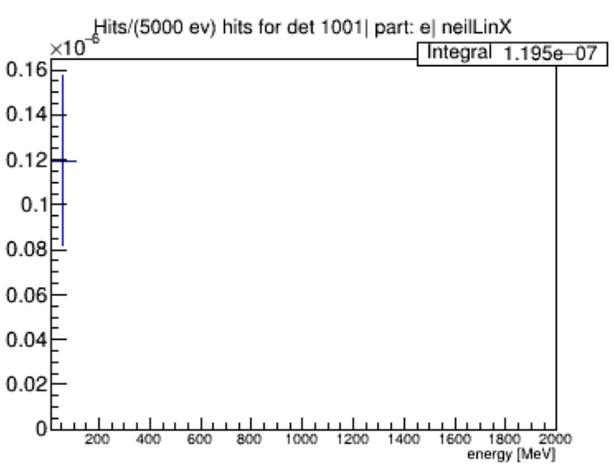
PREX1 dump configuration

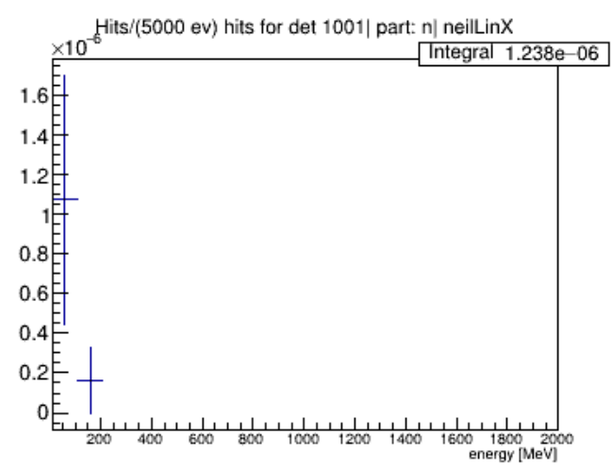






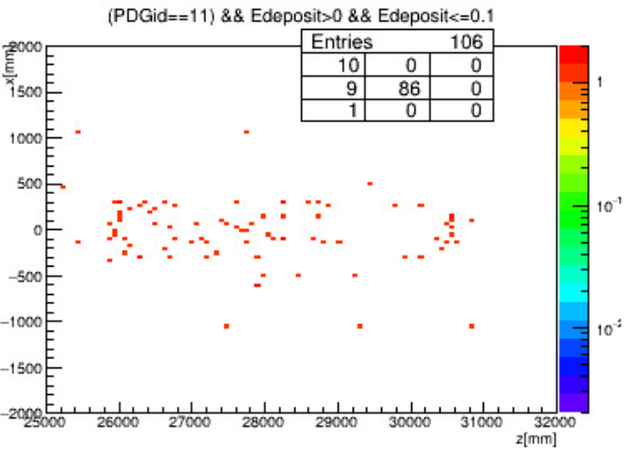


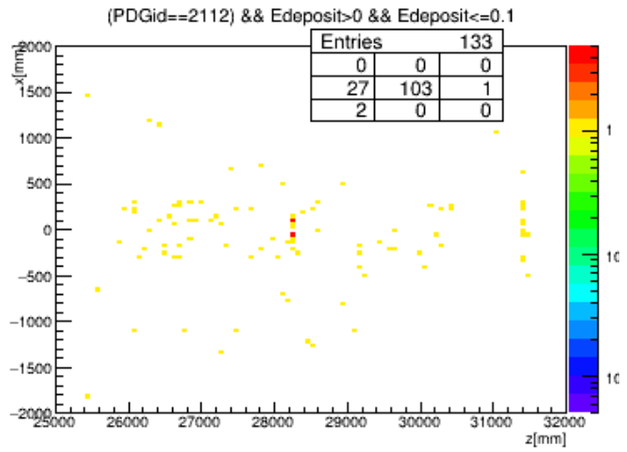


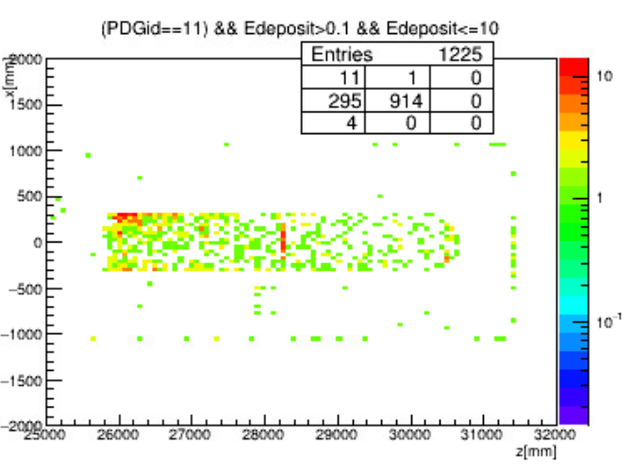


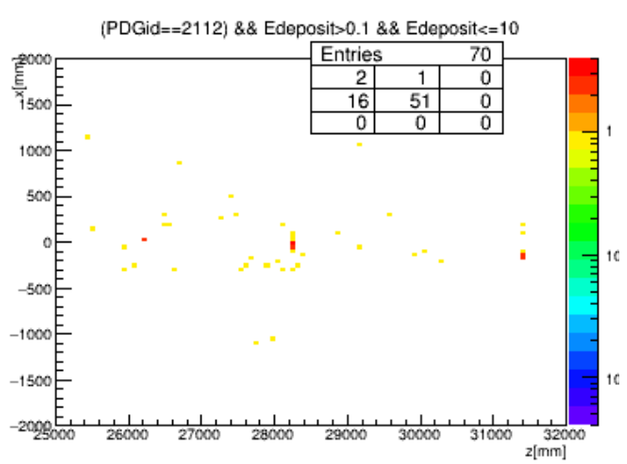
PREX2 - comparison

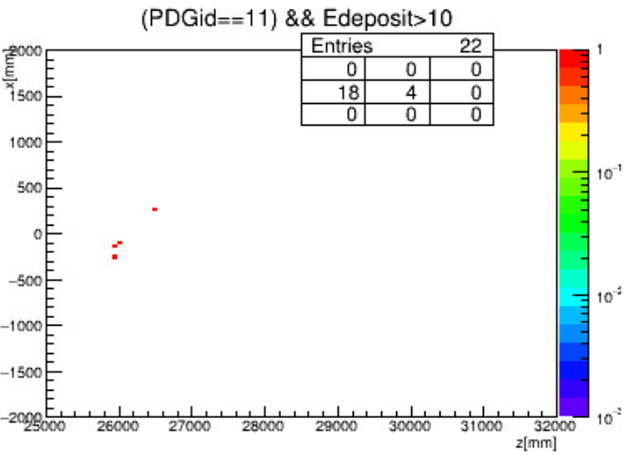
current setup

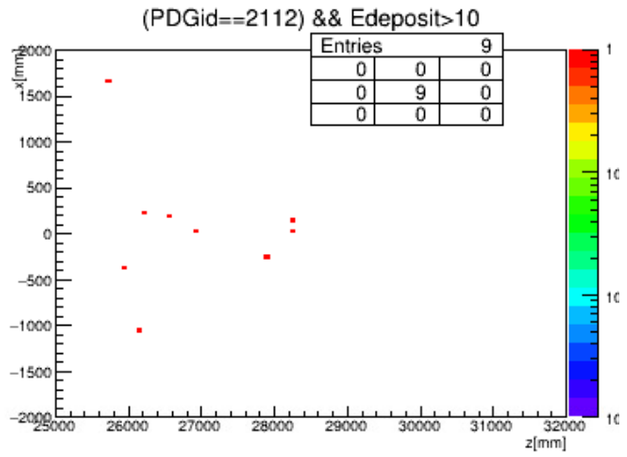




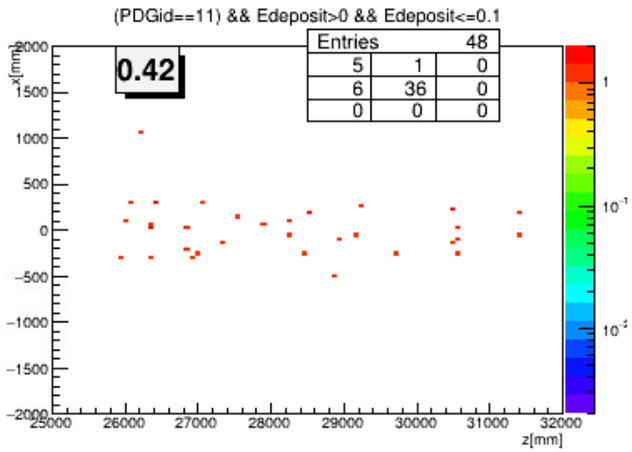


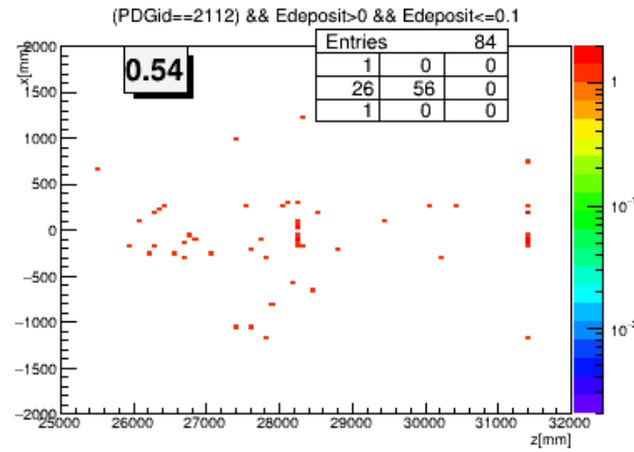


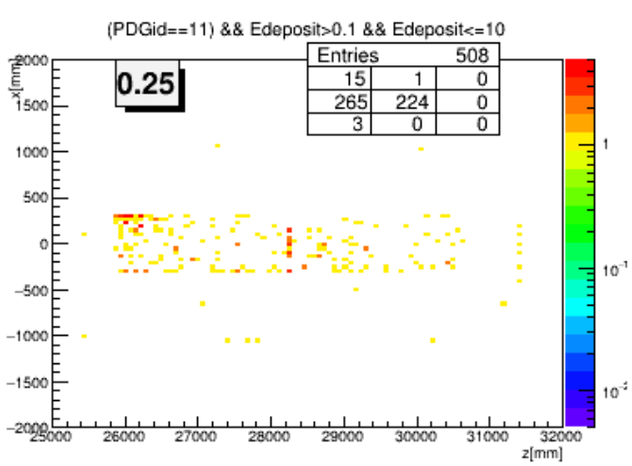


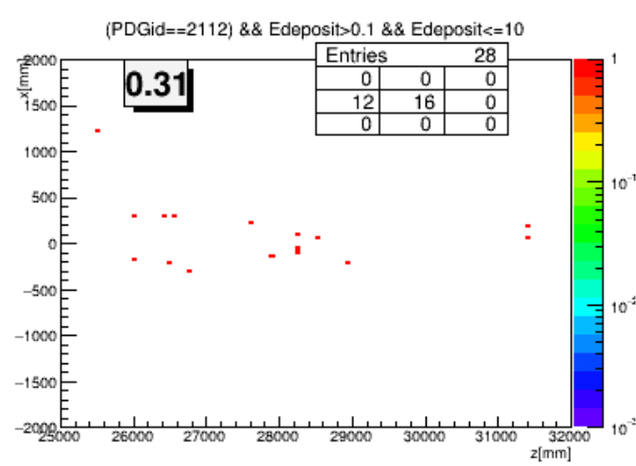


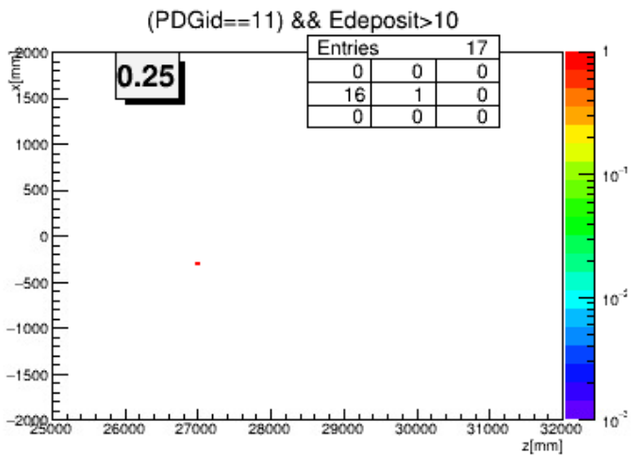
current setup + 1 ft concrete shield

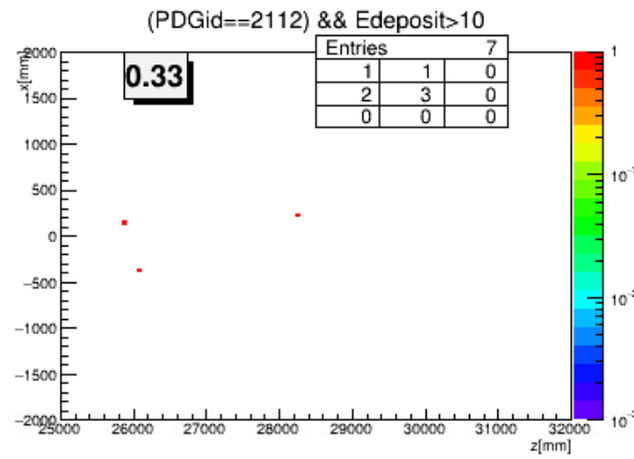






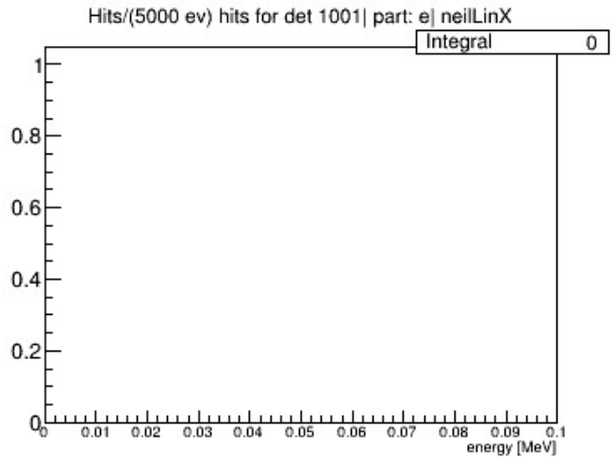


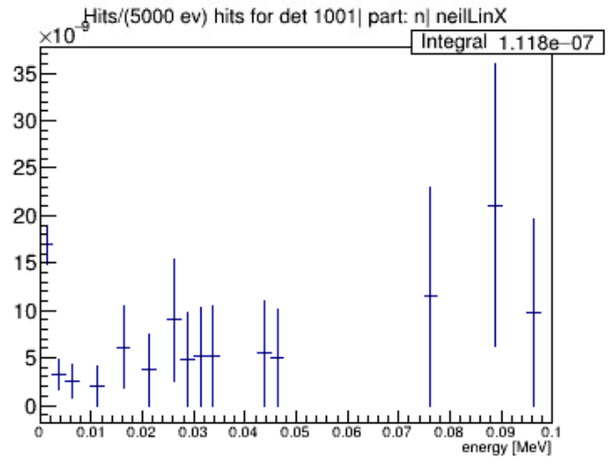


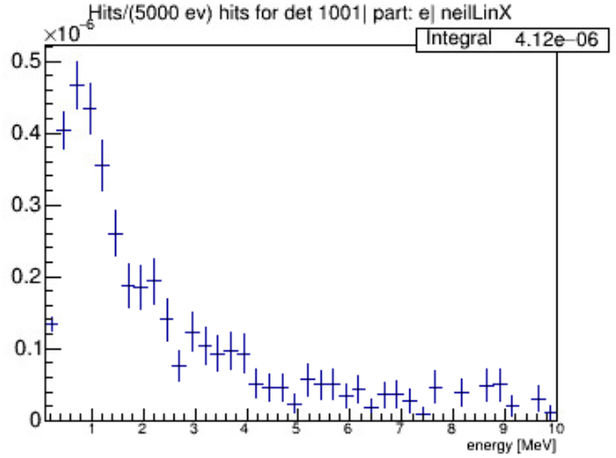


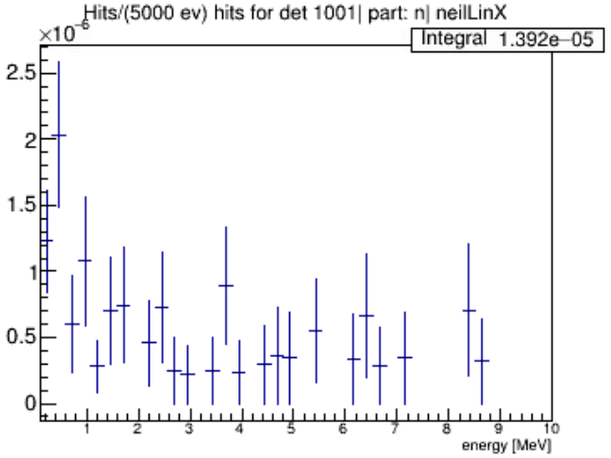
PREX2 - comparison

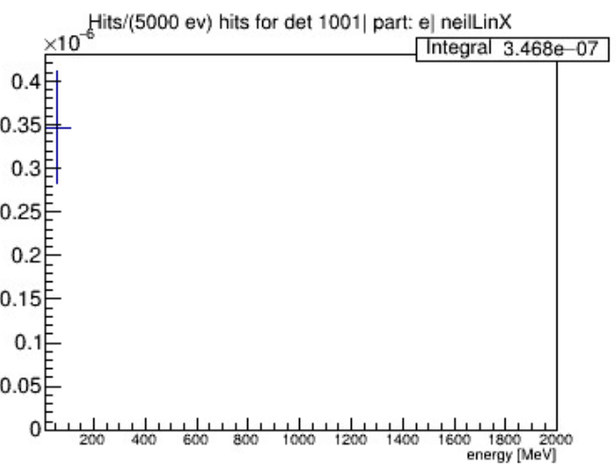
current setup

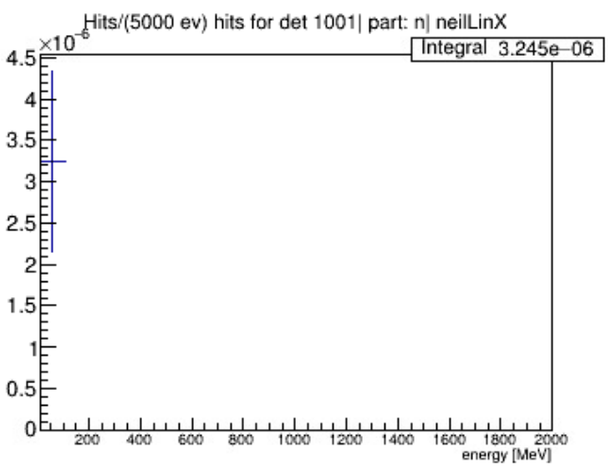




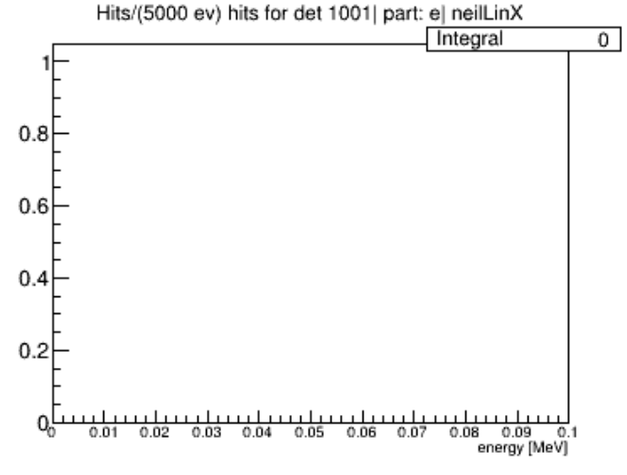


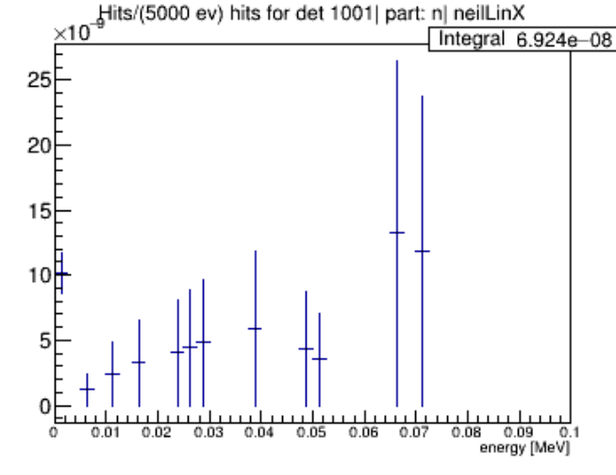


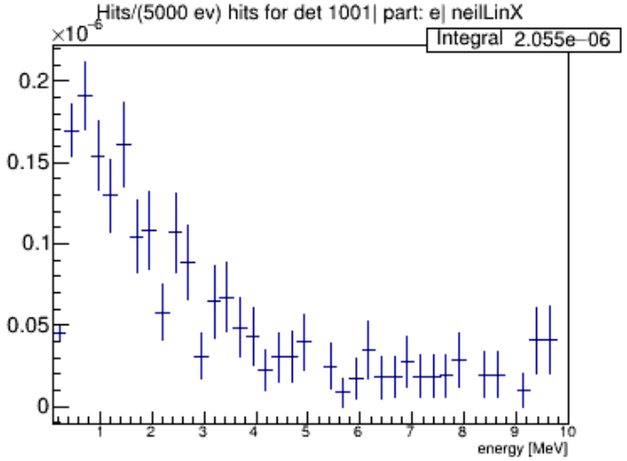


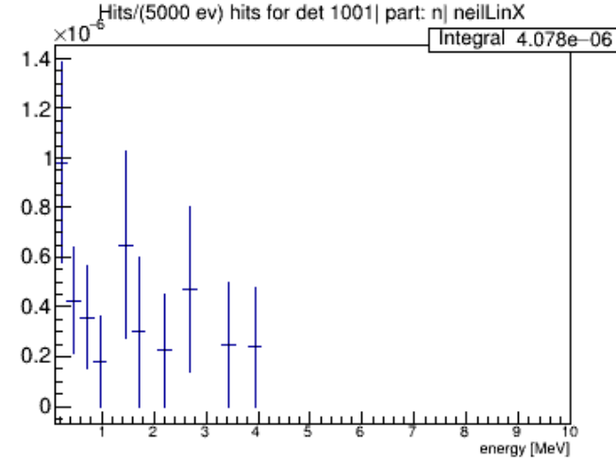


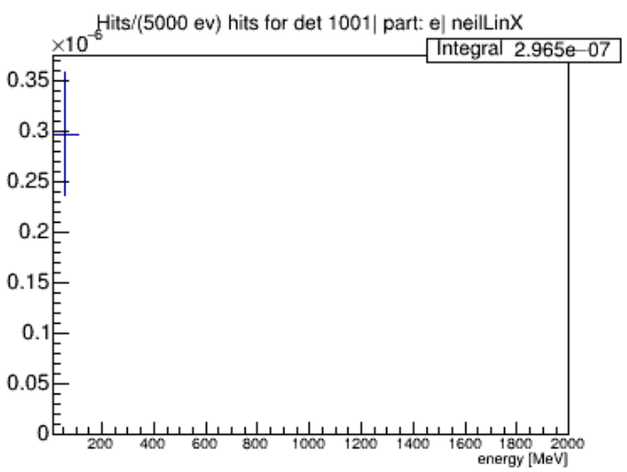
current setup + 1 ft concrete shield

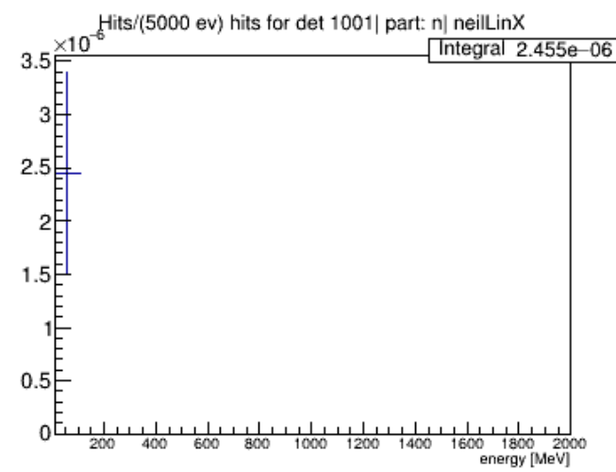






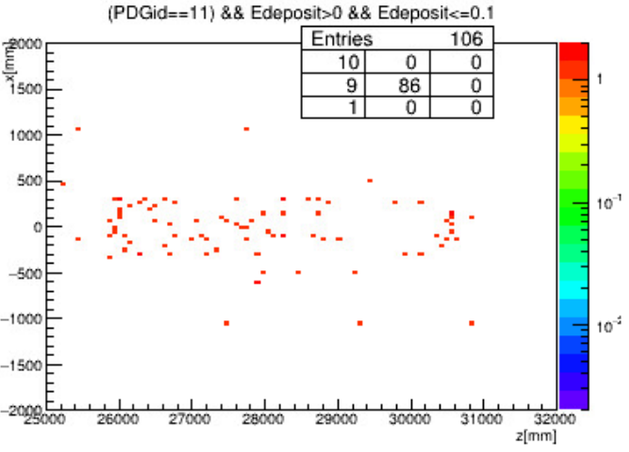


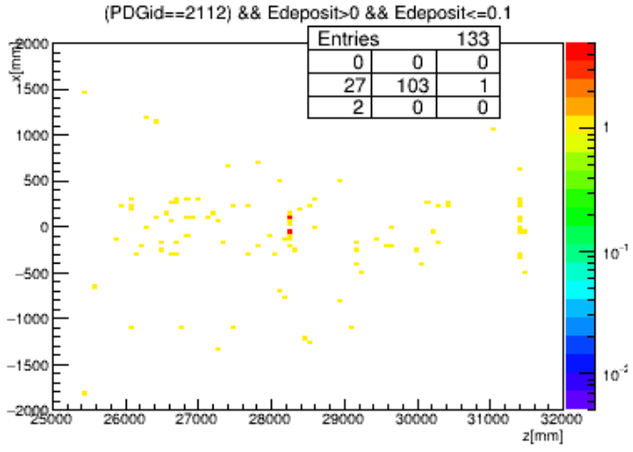


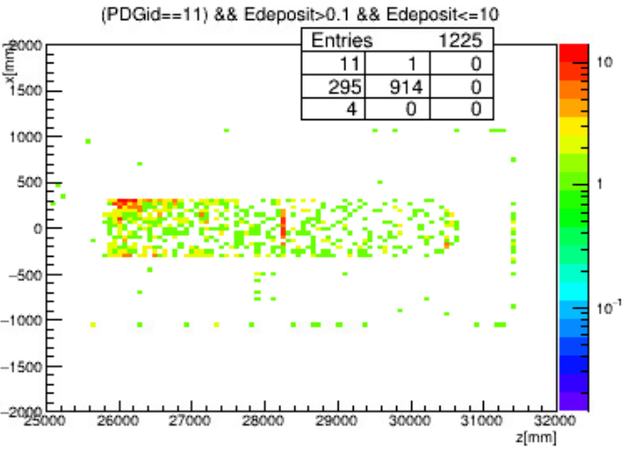


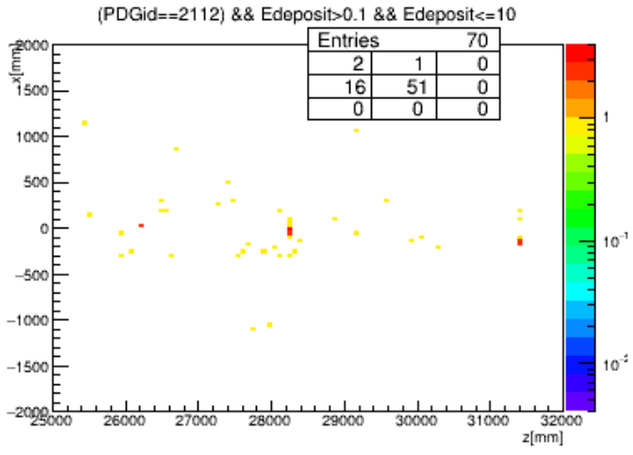
PREX2 - comparison

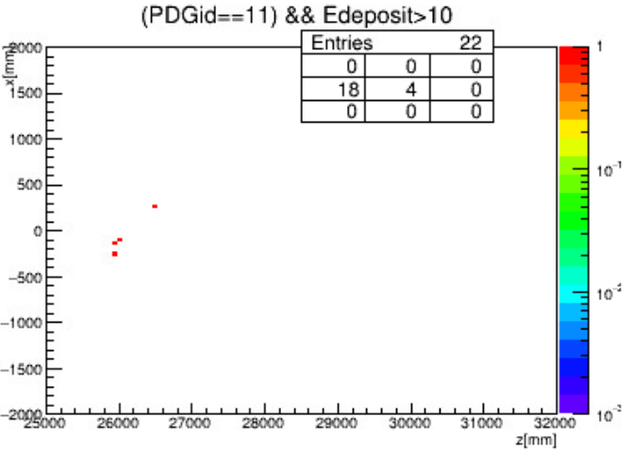
current setup

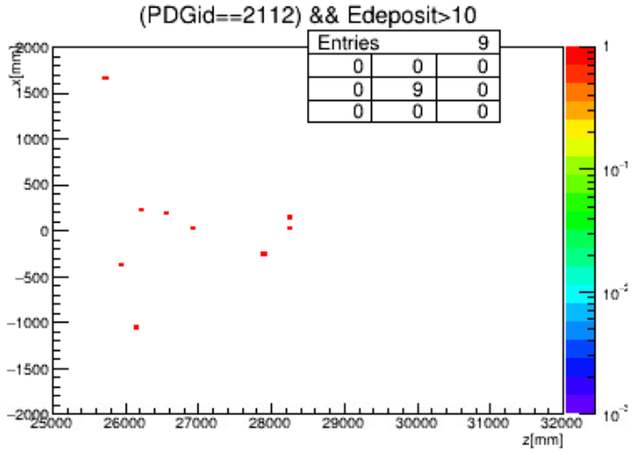




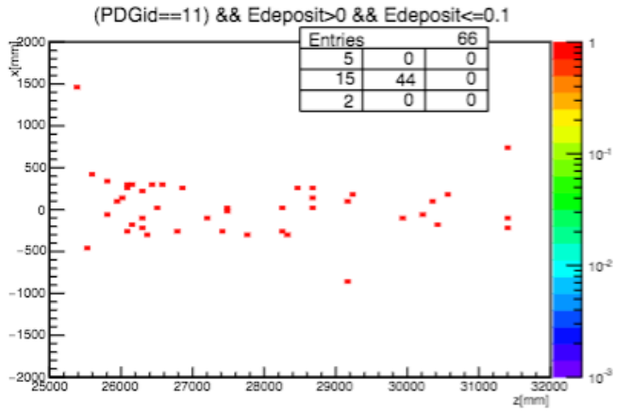


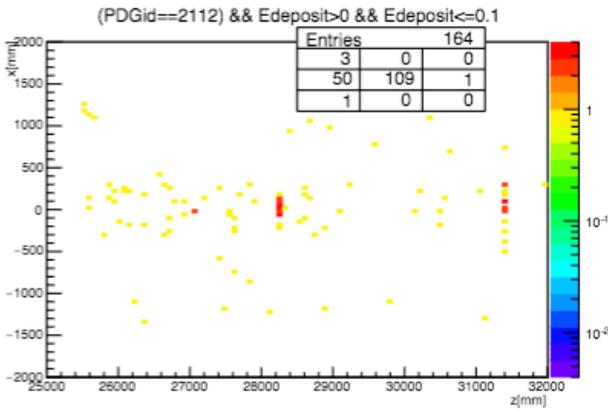


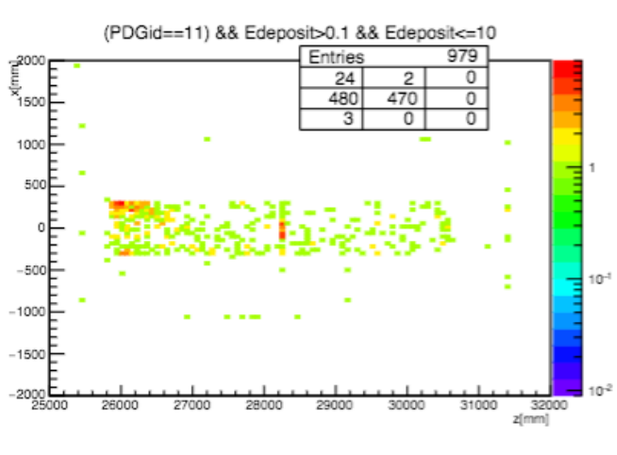


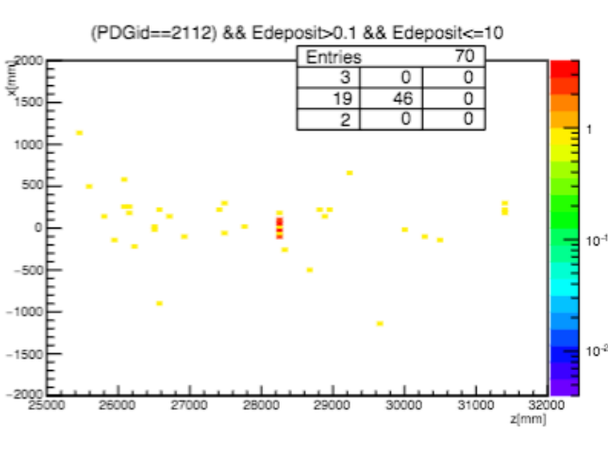


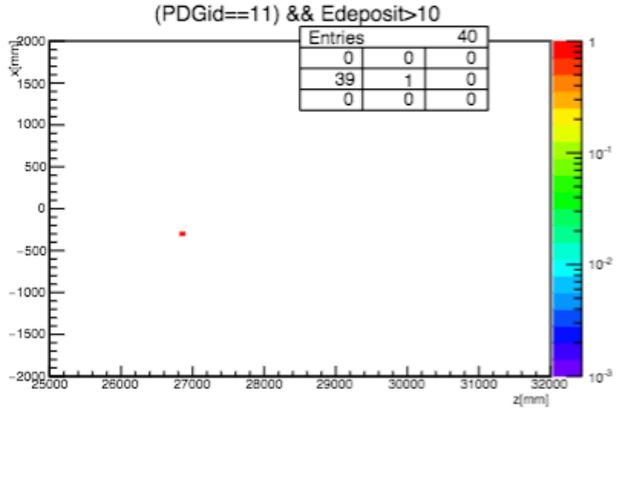
current setup + 0.5 ft concrete shield (2x stat)

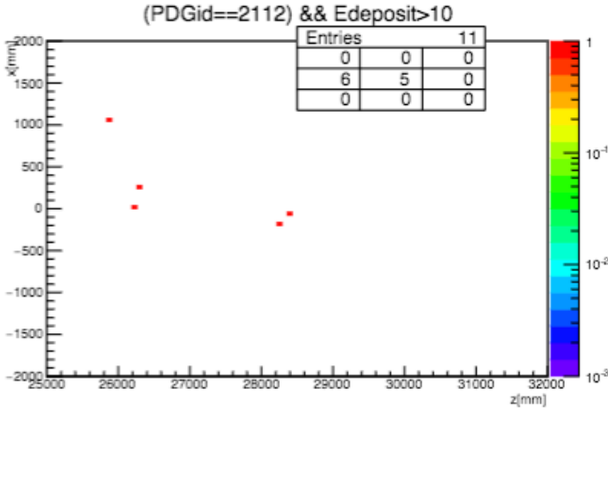






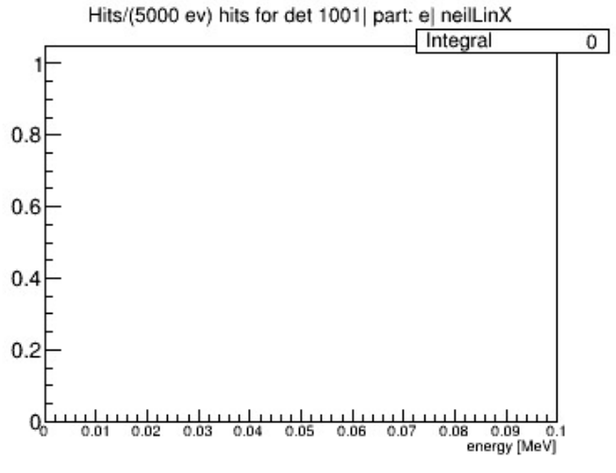


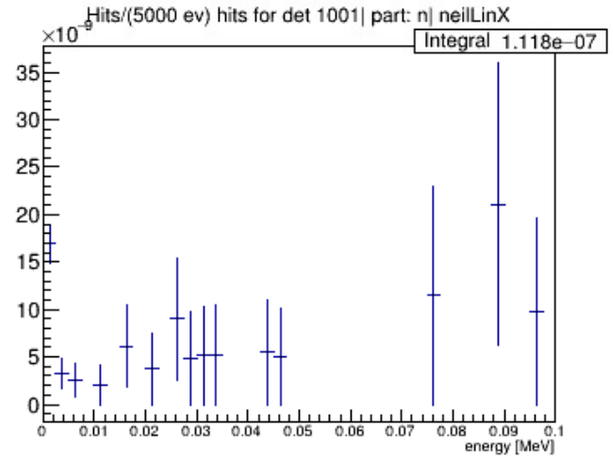


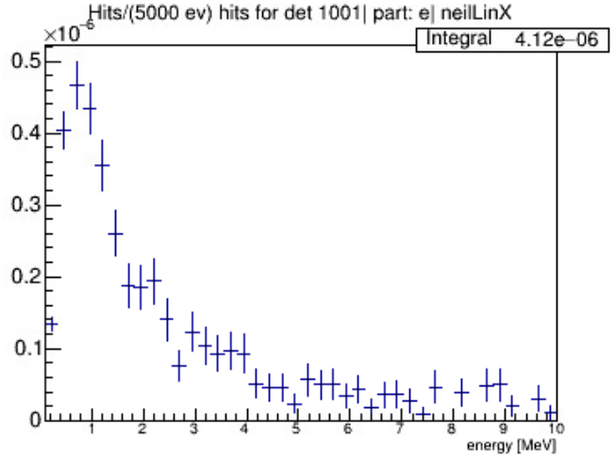


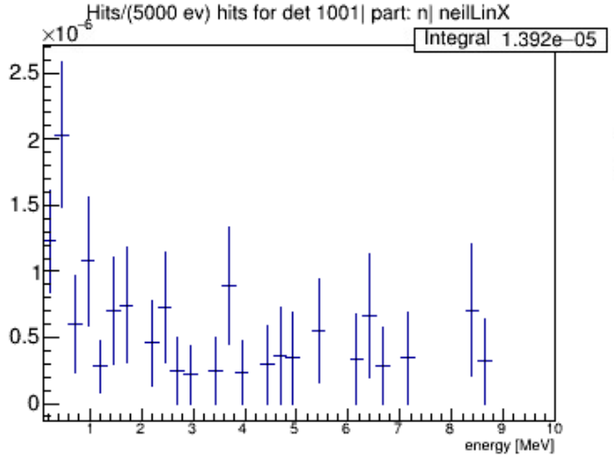
PREX2 - comparison

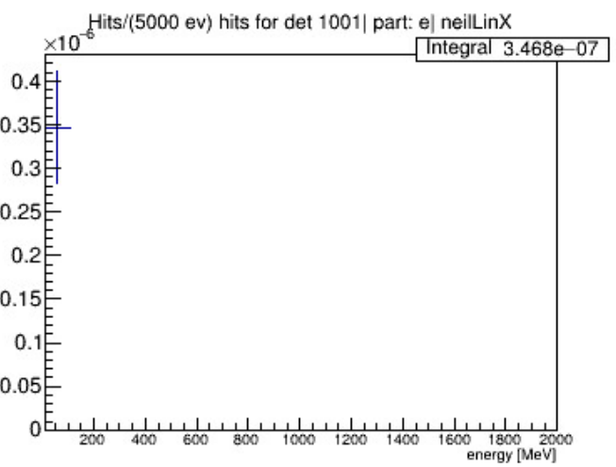
current setup

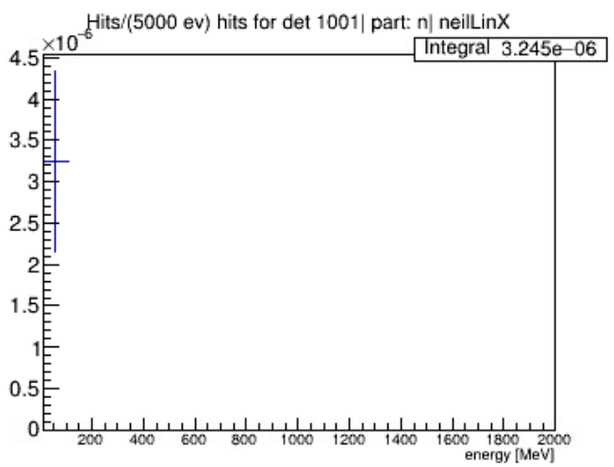




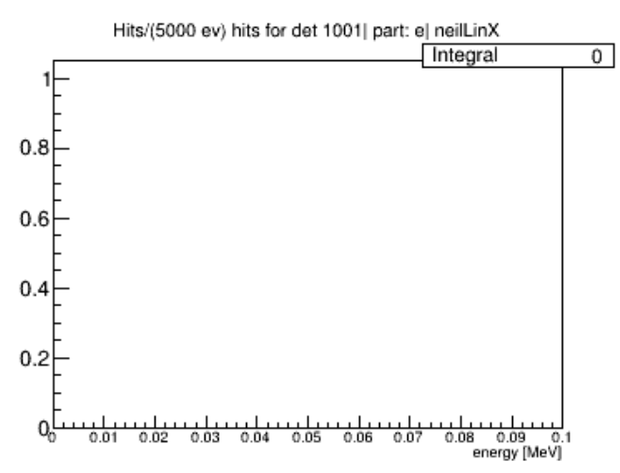


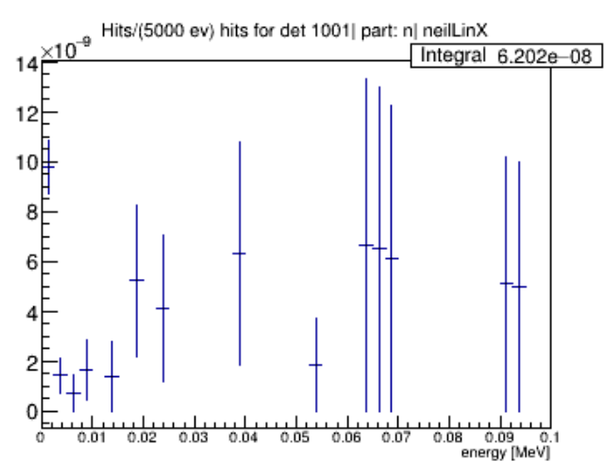


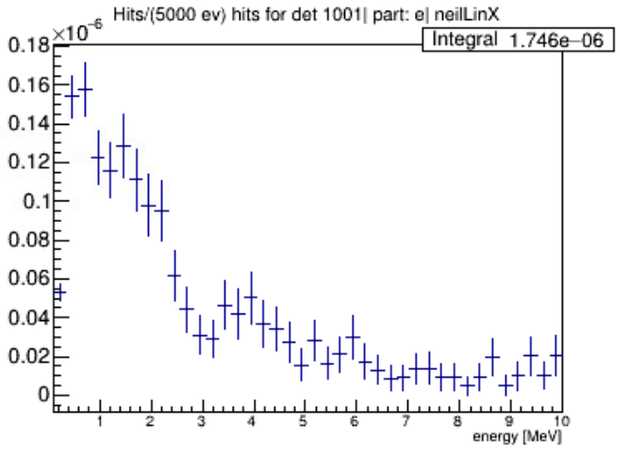


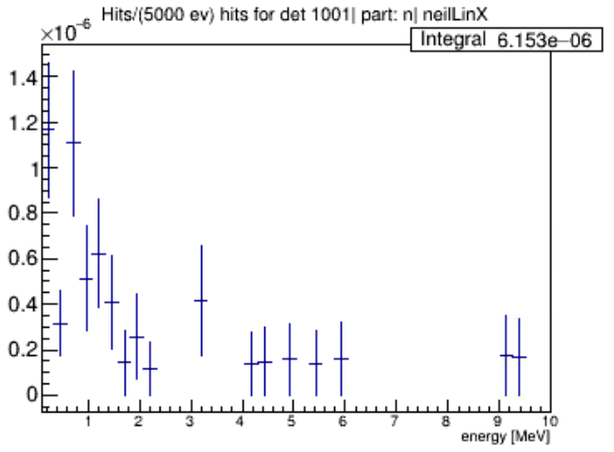


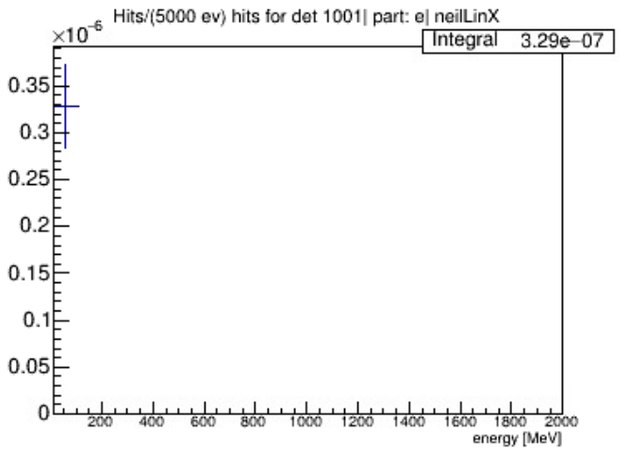
current setup + 0.5 ft concrete shield

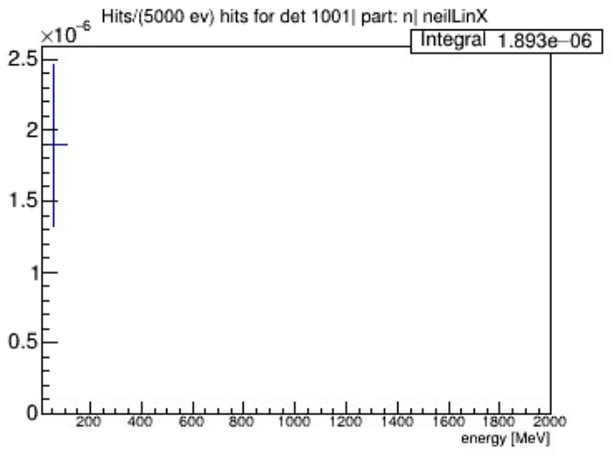






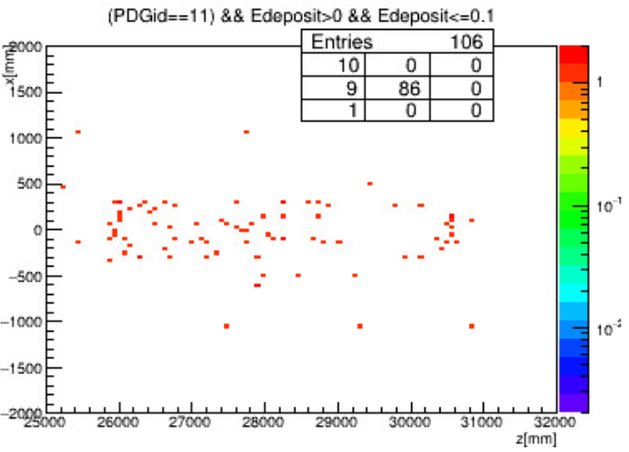


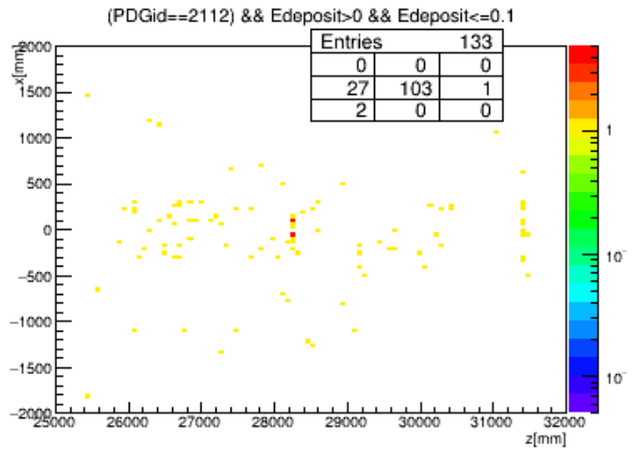


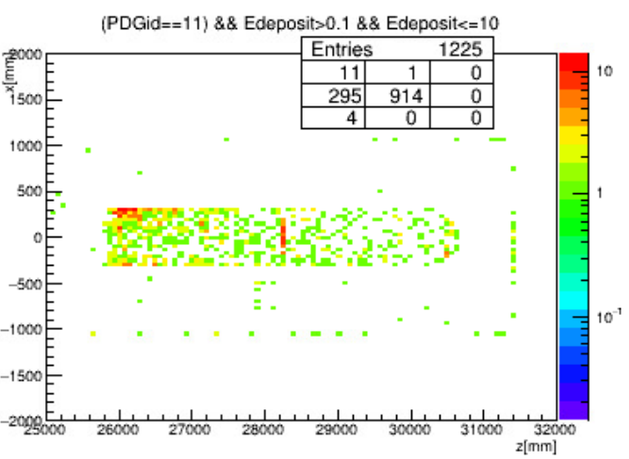


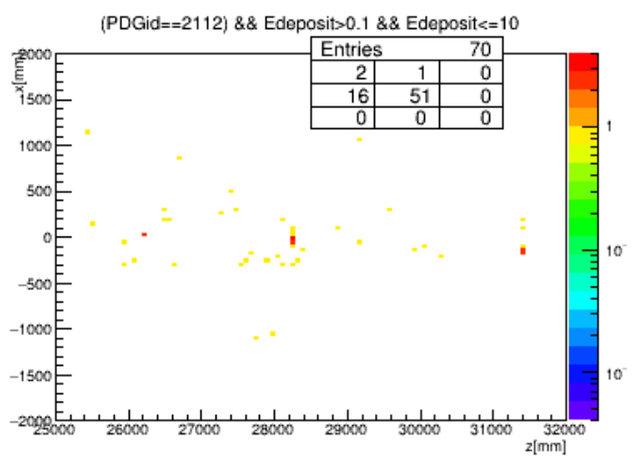
PREX2 - comparison

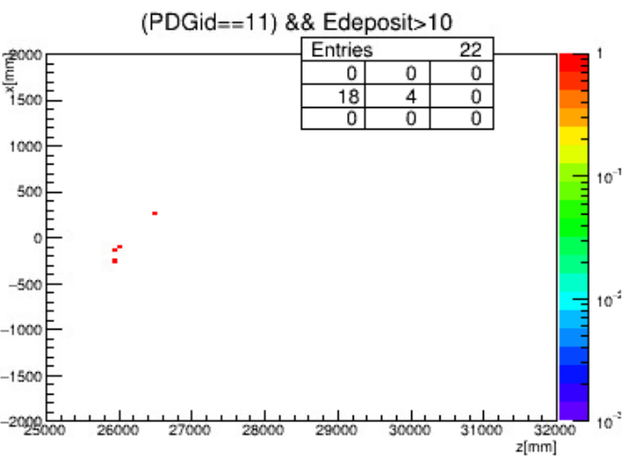
current setup

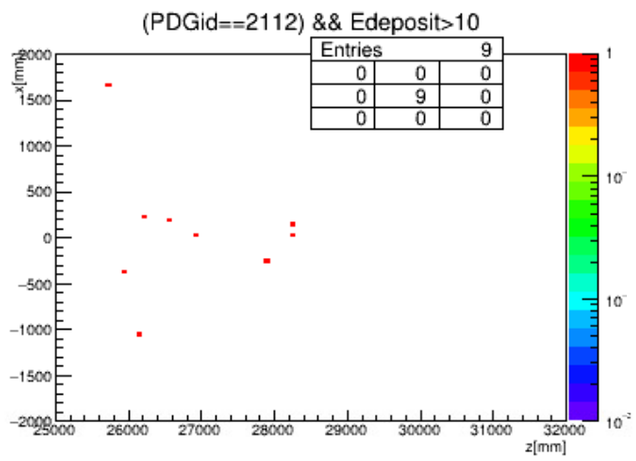




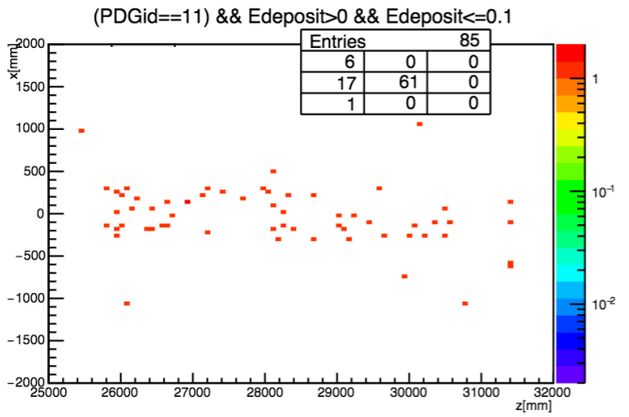


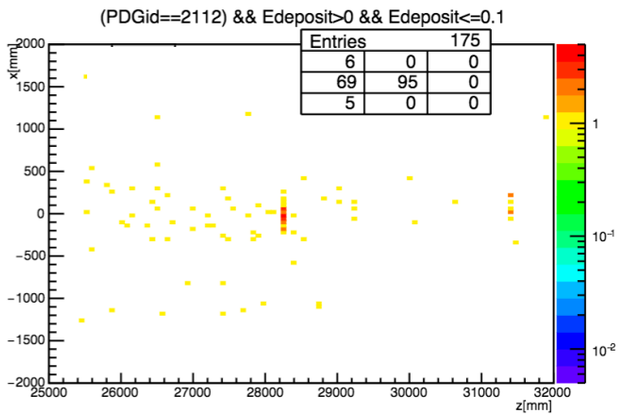


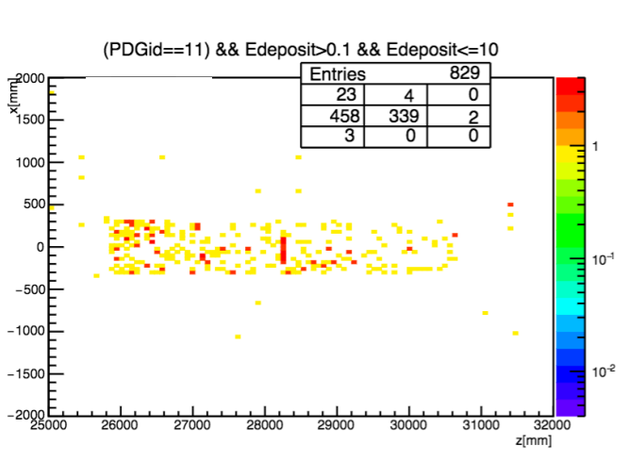


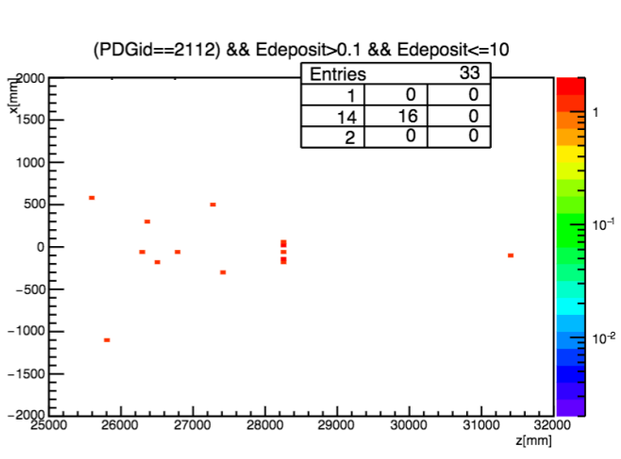


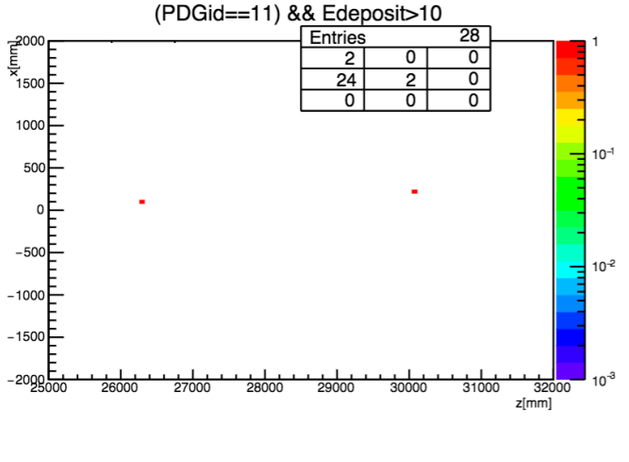
current setup + 2 ft concrete shield (2x stat)

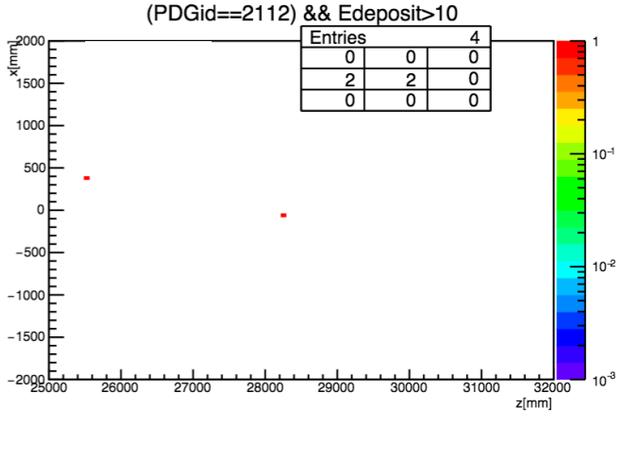






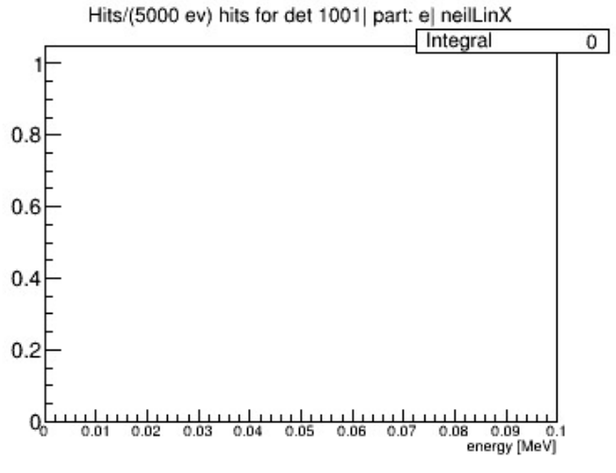


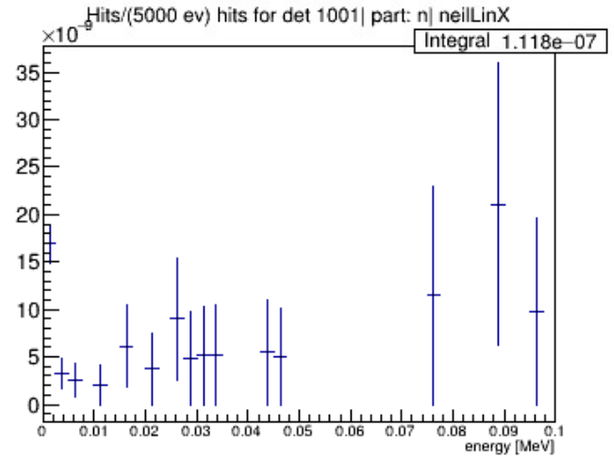


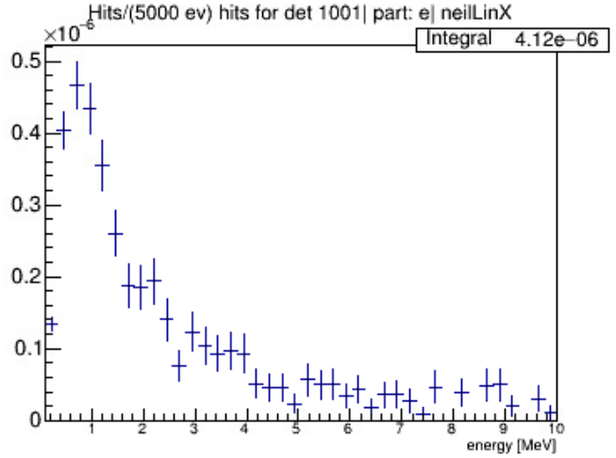


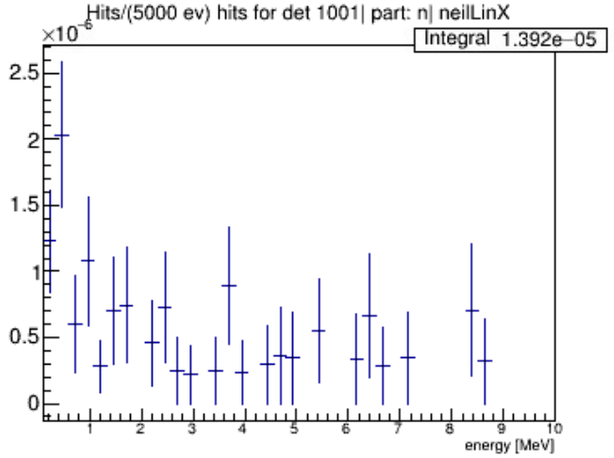
PREX2 - comparison

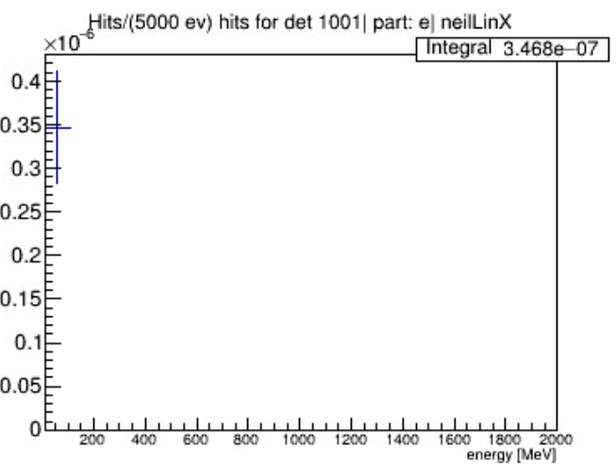
current setup

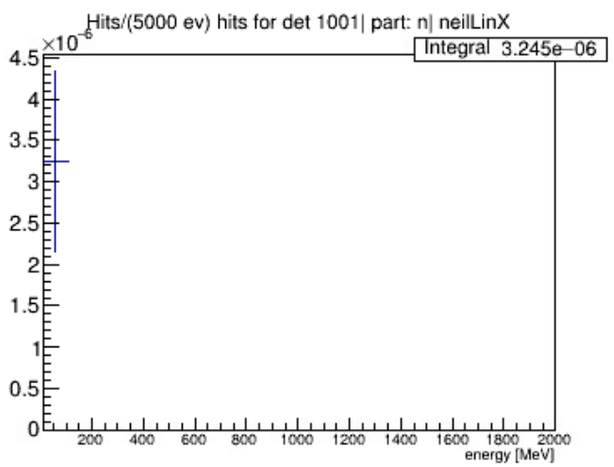




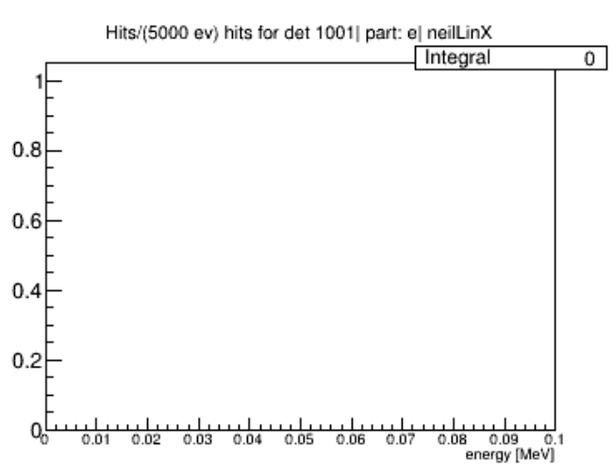


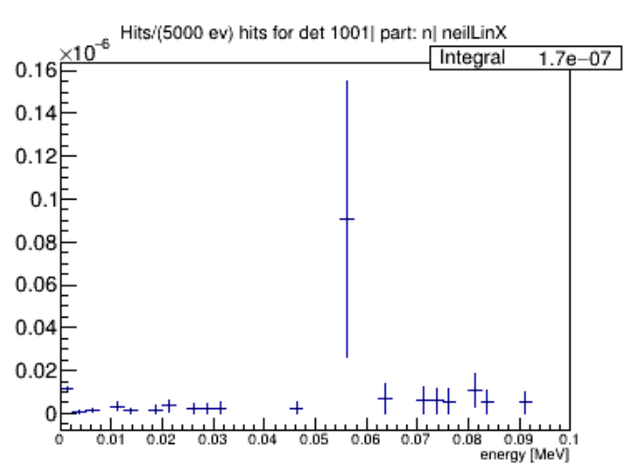


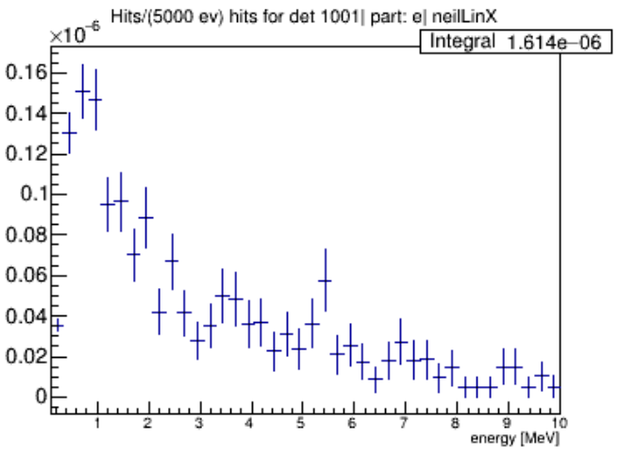


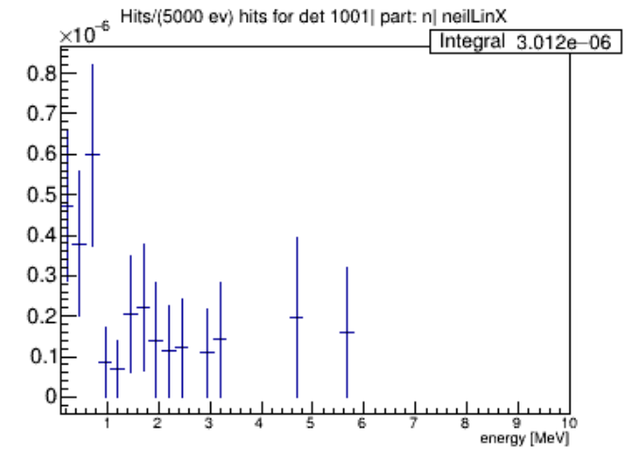


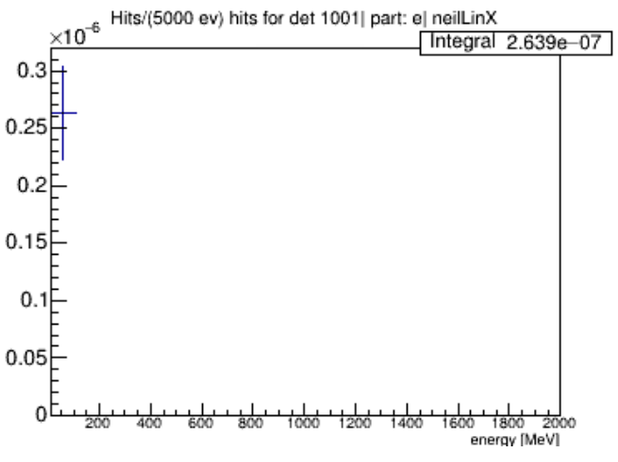
current setup + 2 ft concrete shield

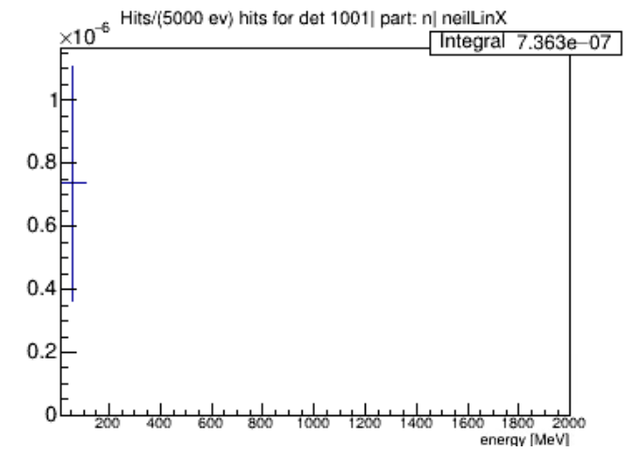






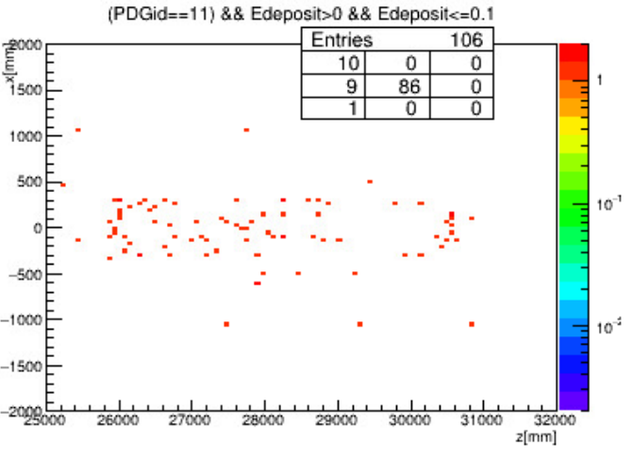


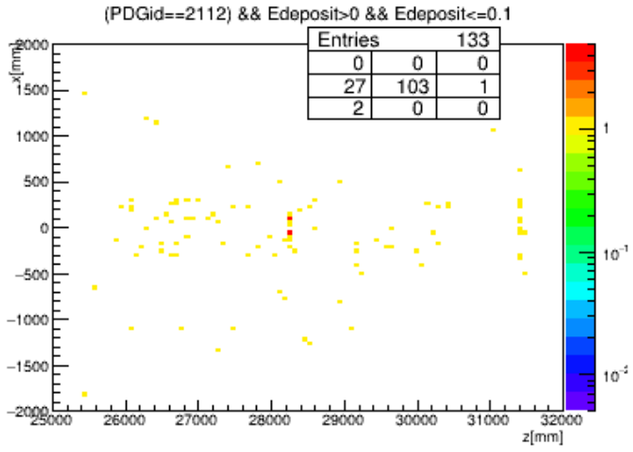


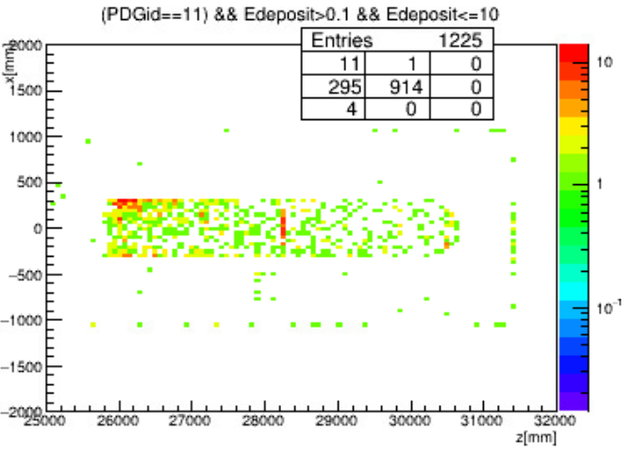


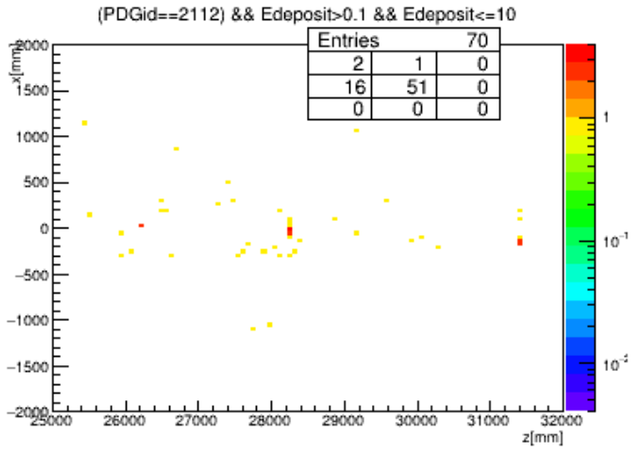
PREX2 - comparison

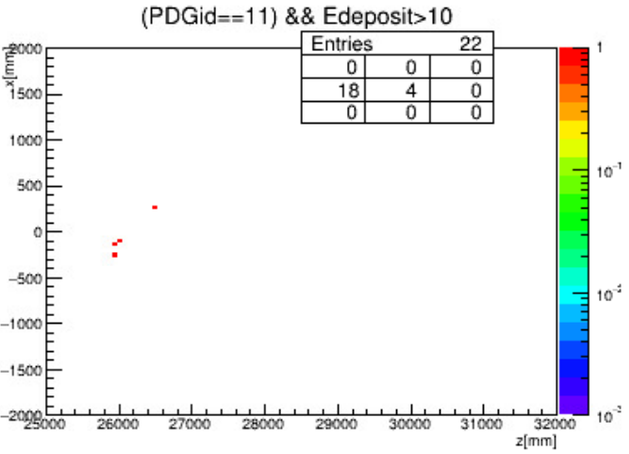
current setup

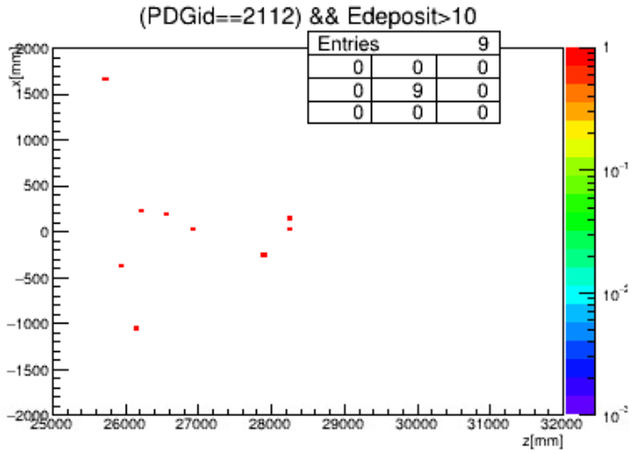




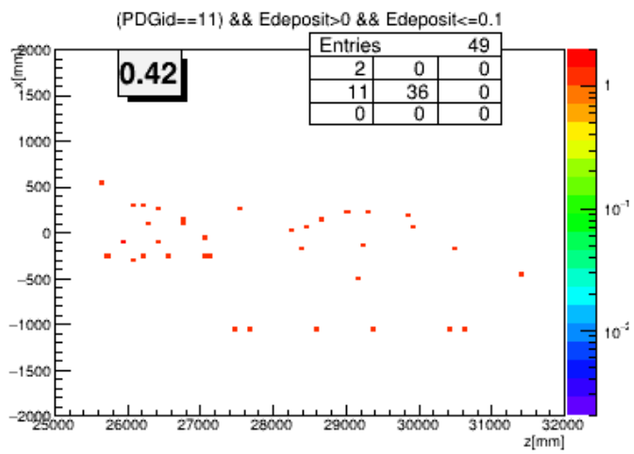


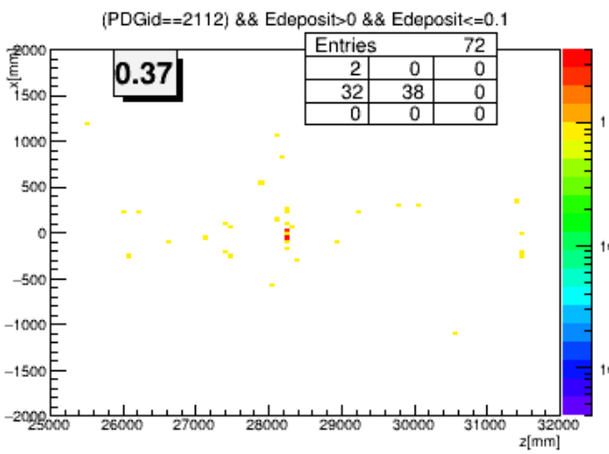


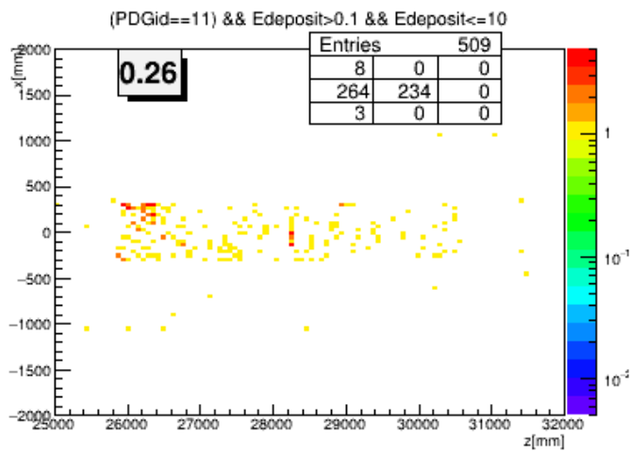


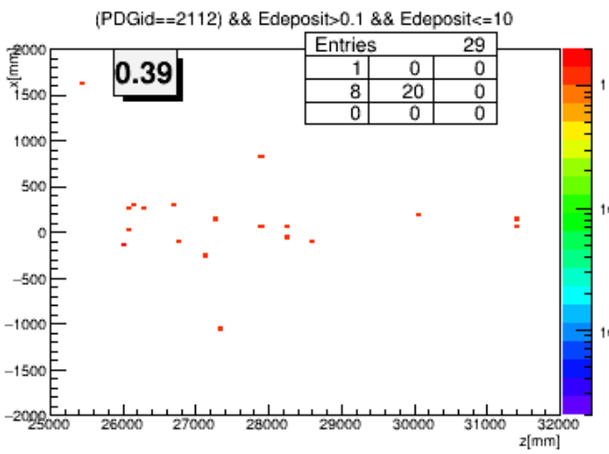


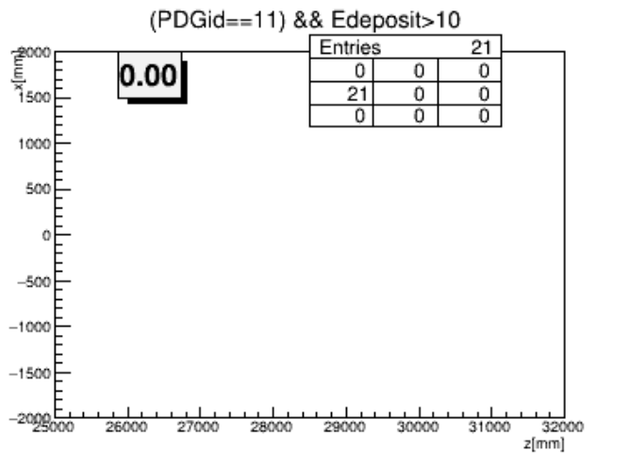
current setup + 1 ft Poly shield

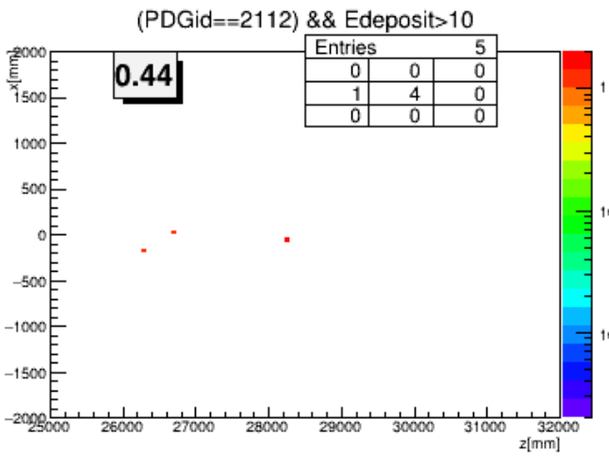






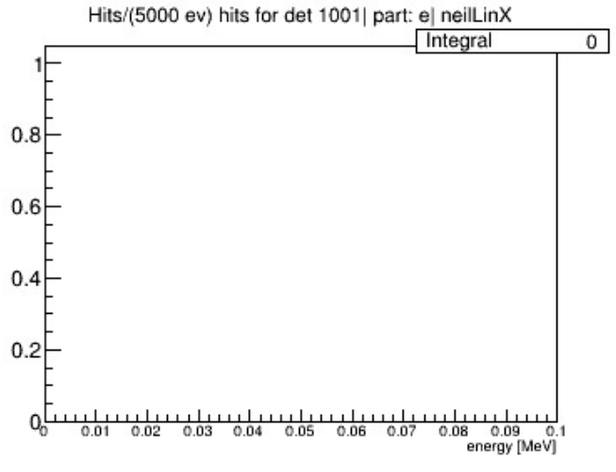


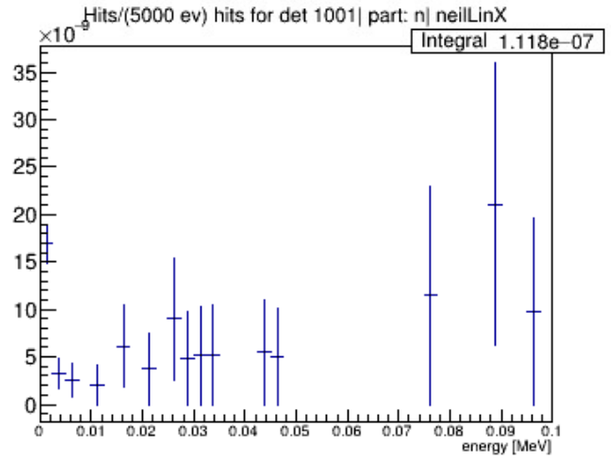


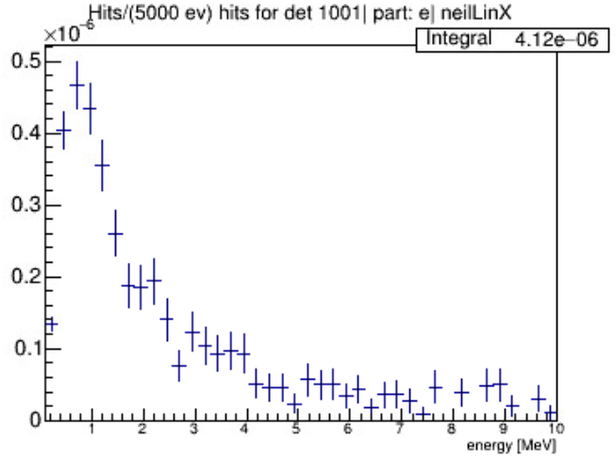


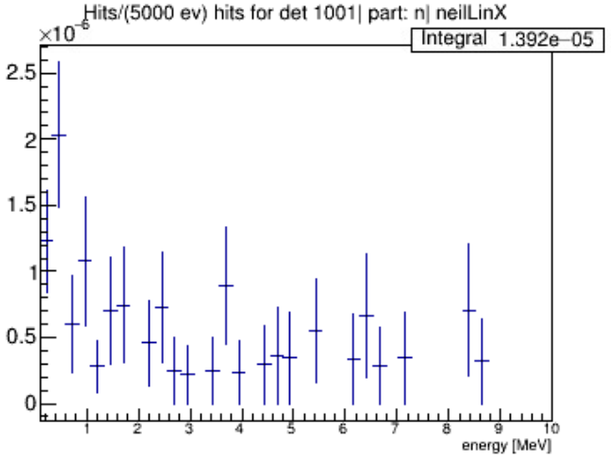
PREX2 - comparison

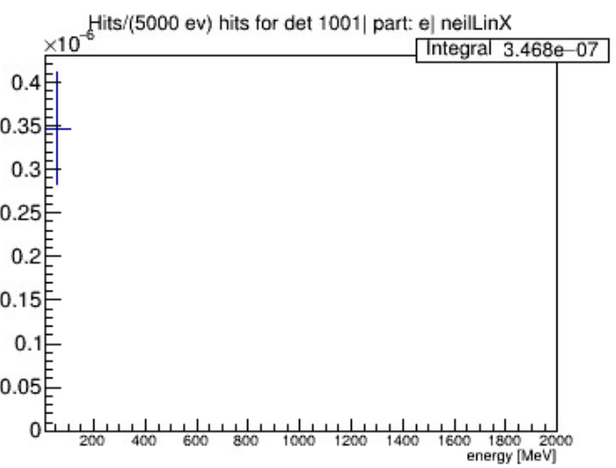
current setup

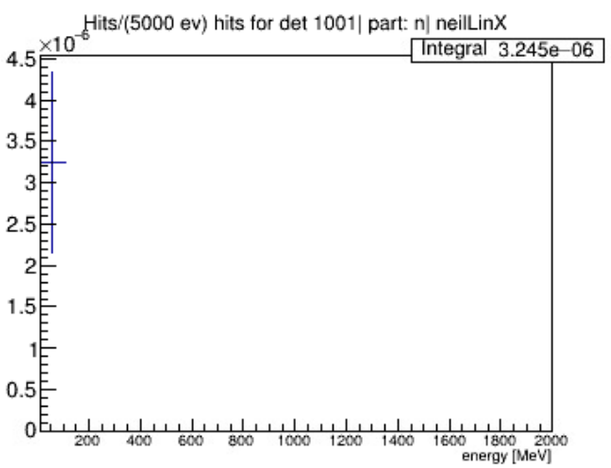




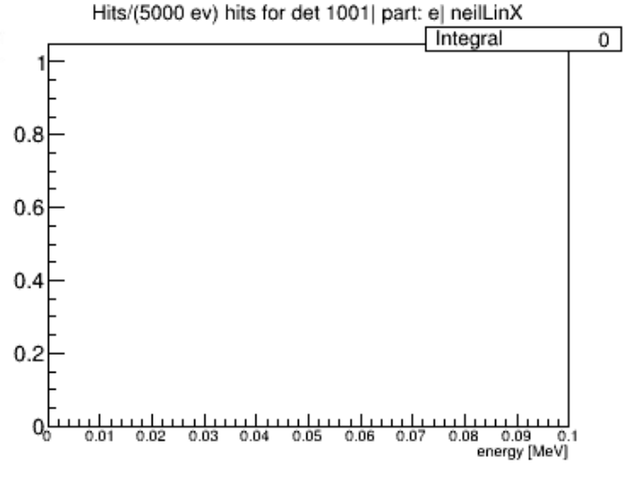


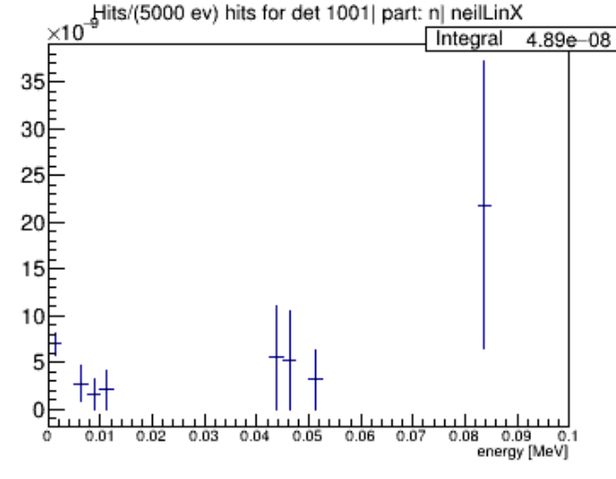


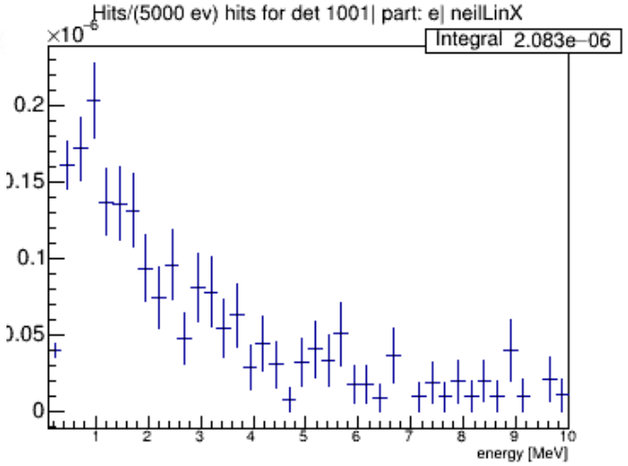


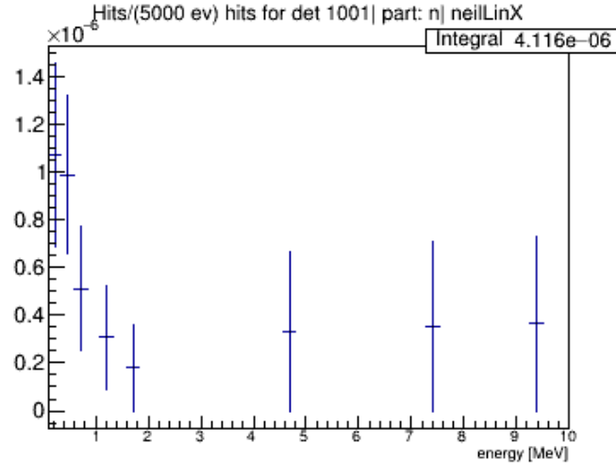


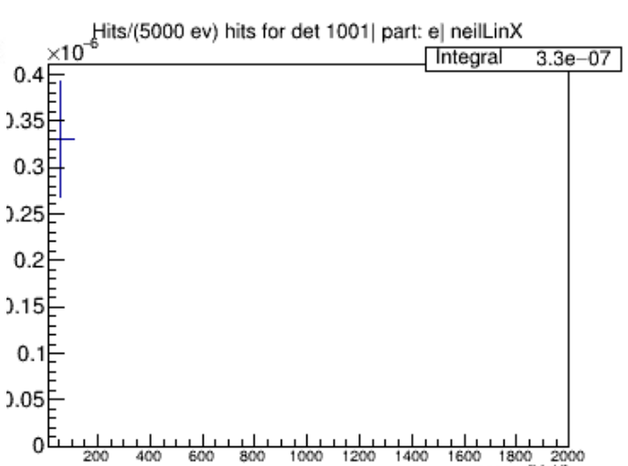
current setup + 1 ft Poly shield

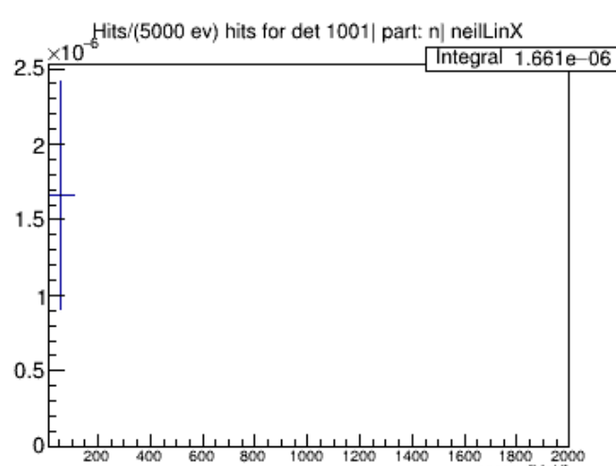






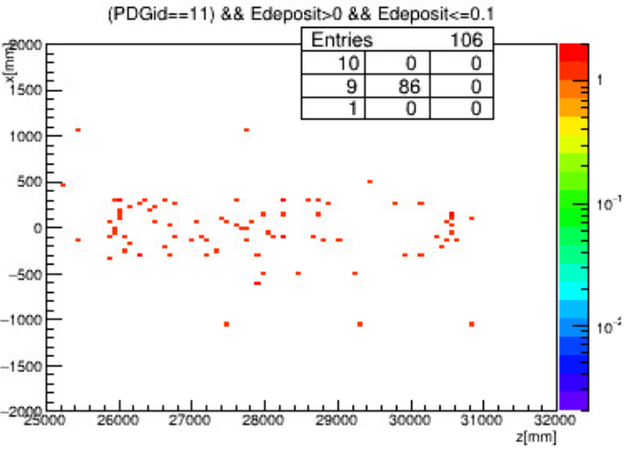


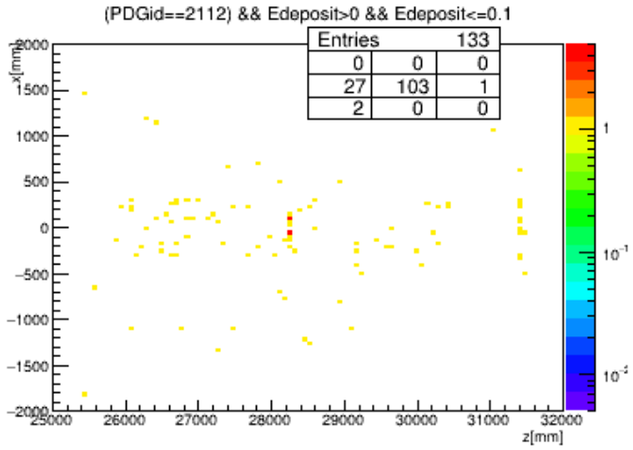


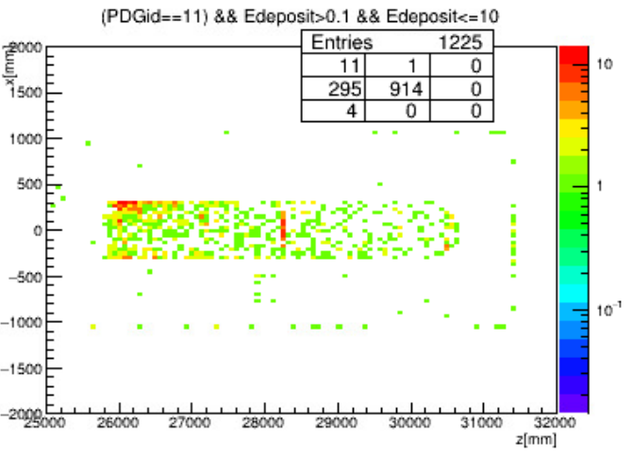


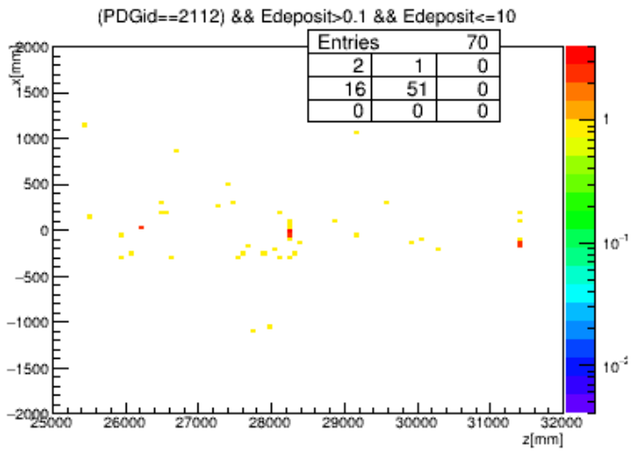
PREX2 - comparison

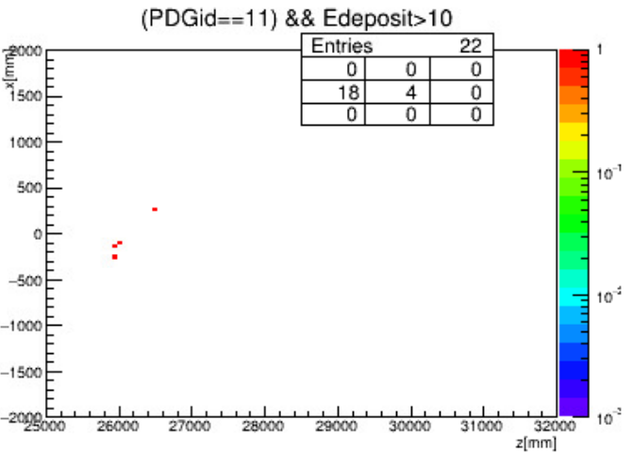
current setup

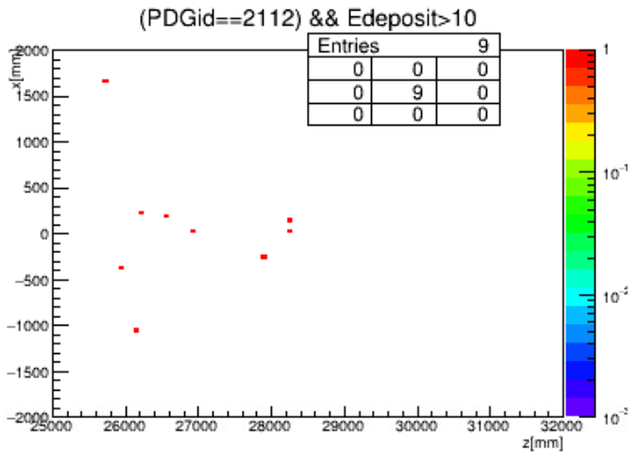




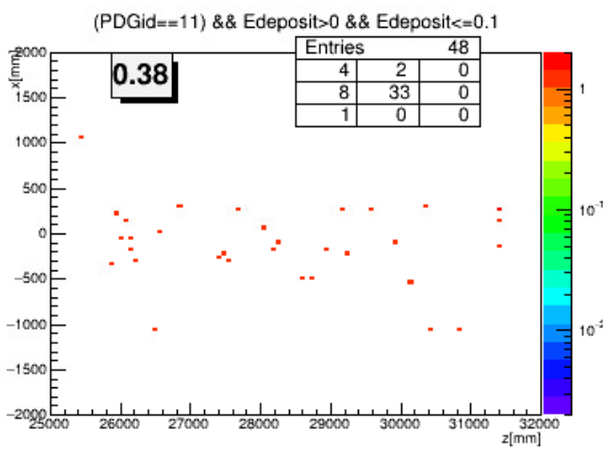


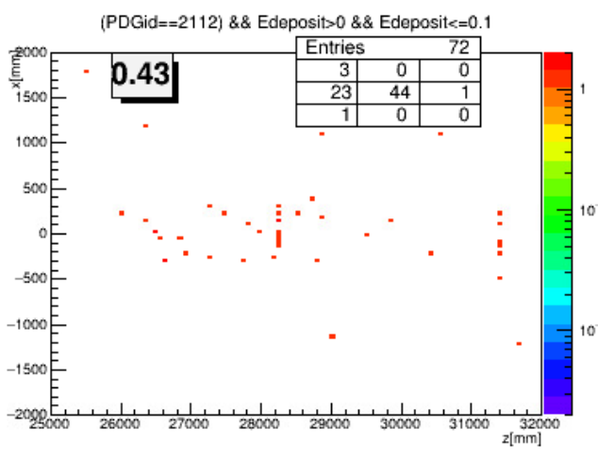


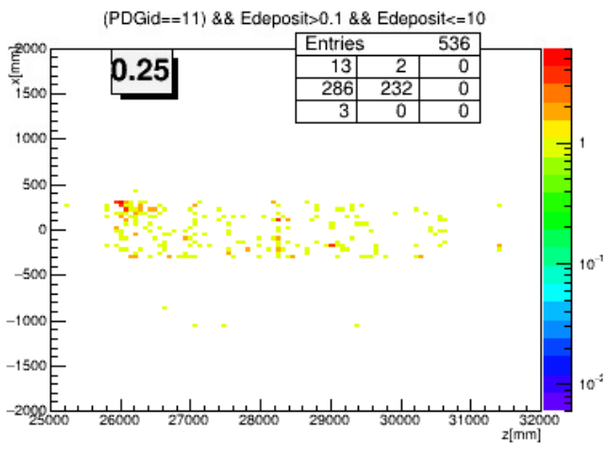


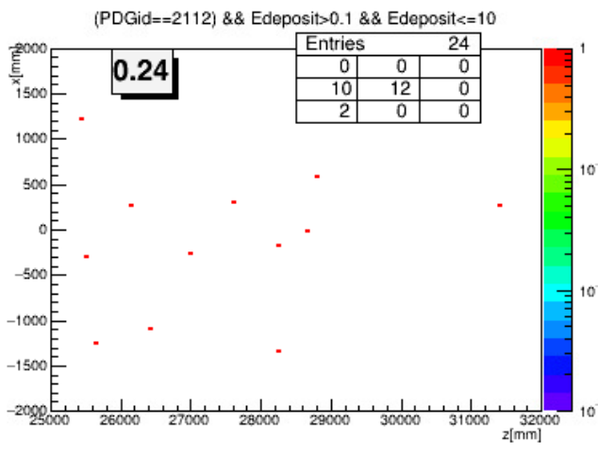


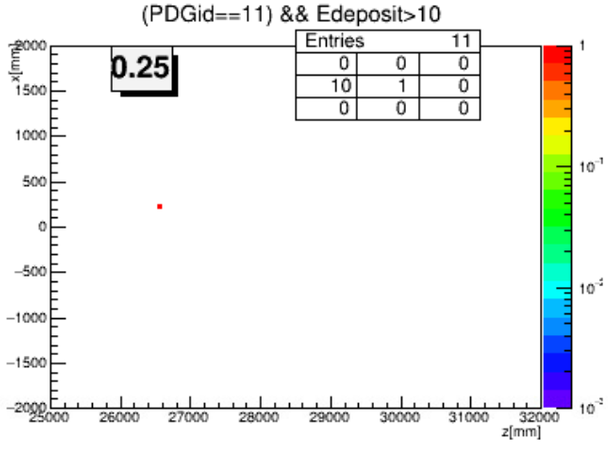
current setup + 4 in Donut+ 1 ft concrete shield

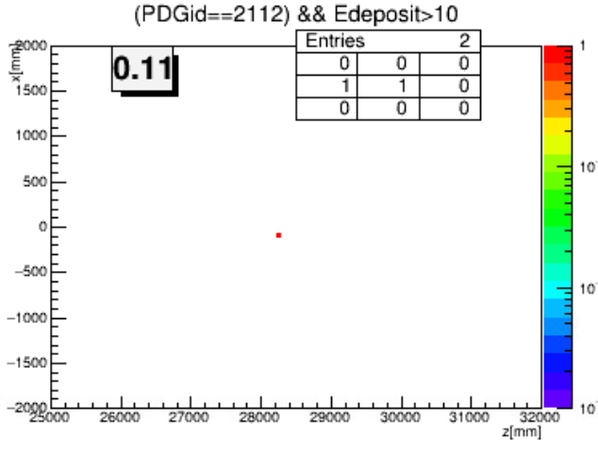






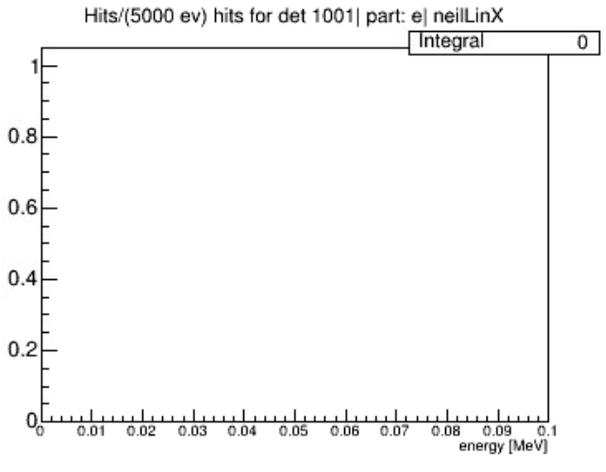


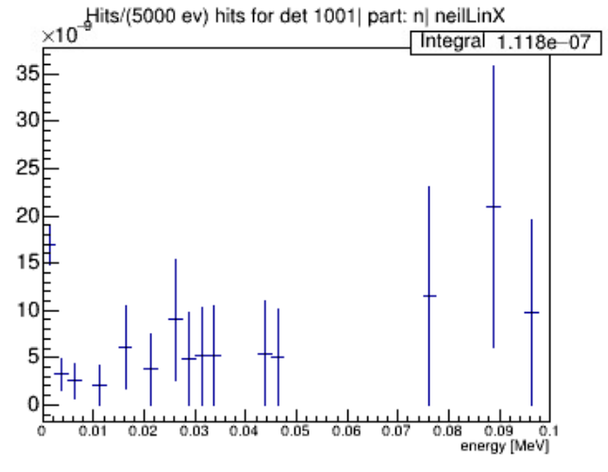


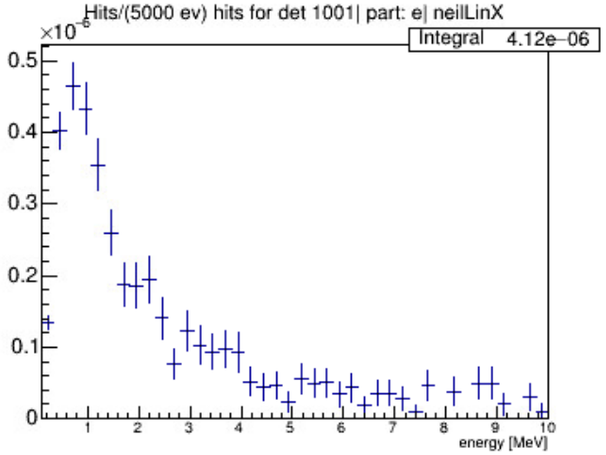


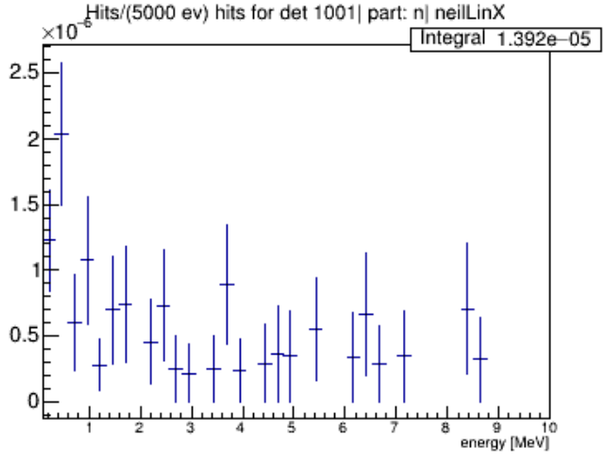
PREX2 - comparison

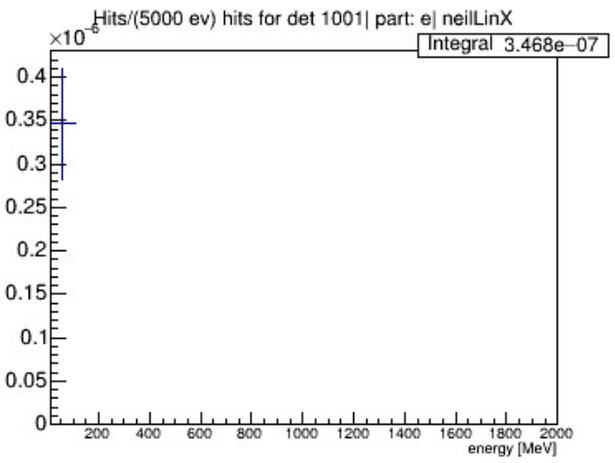
current setup

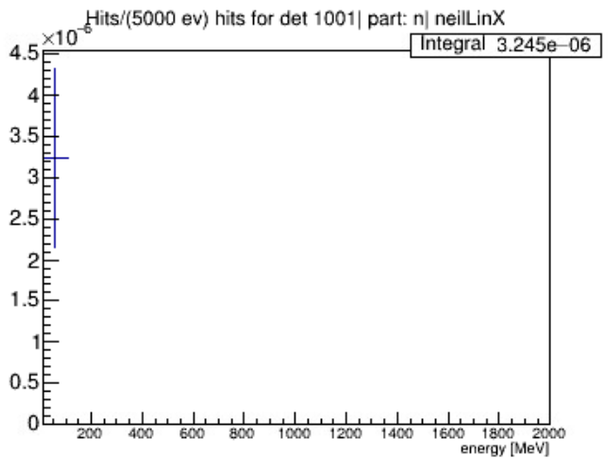




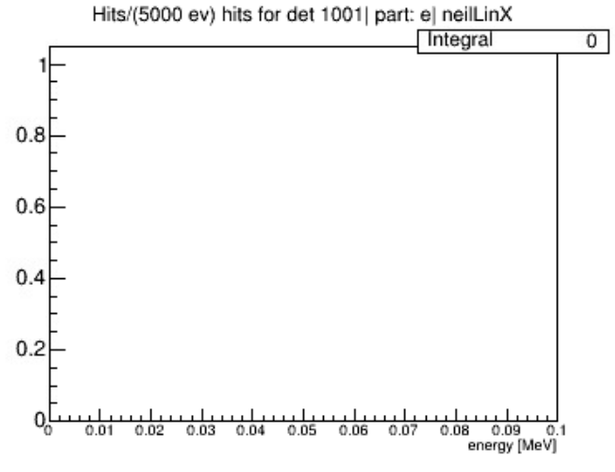


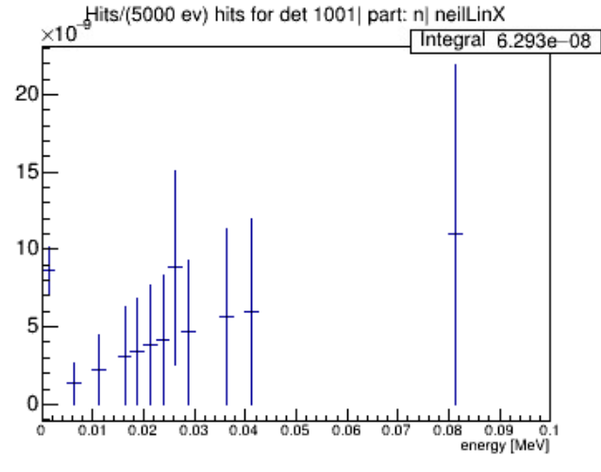


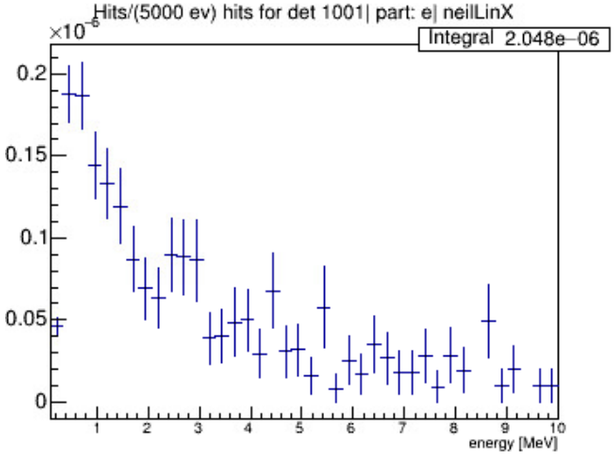


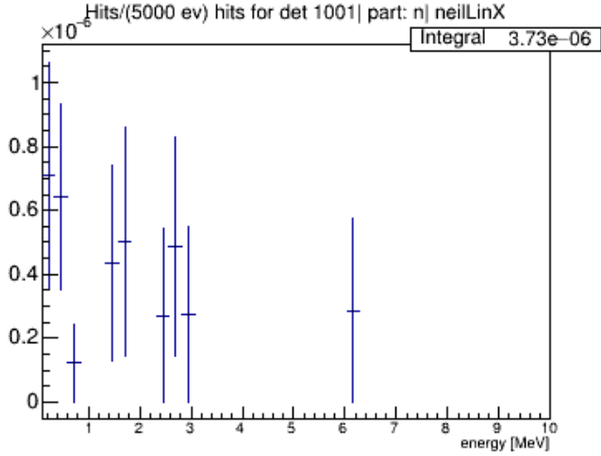


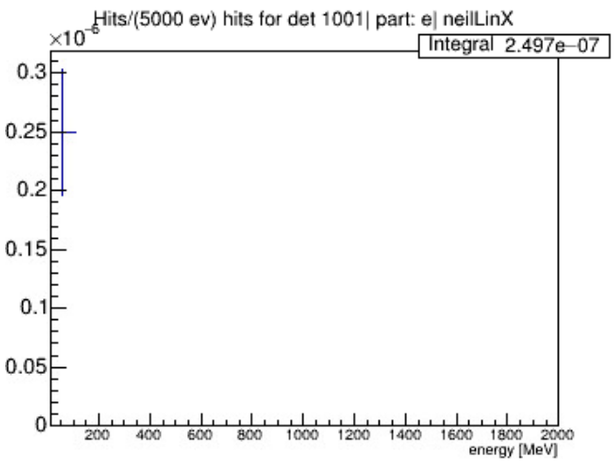
current setup + 4 in Donut+ 1 ft concrete shield

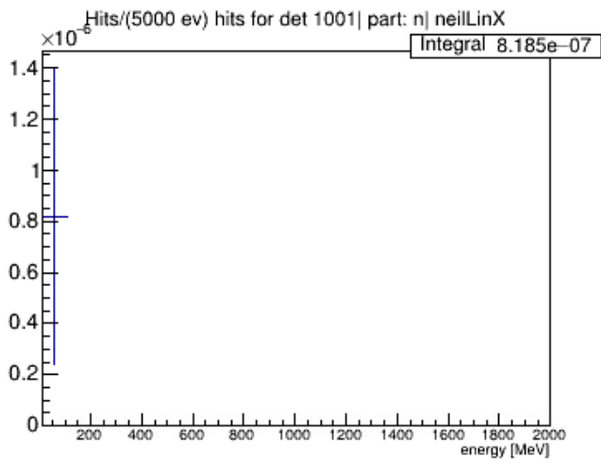








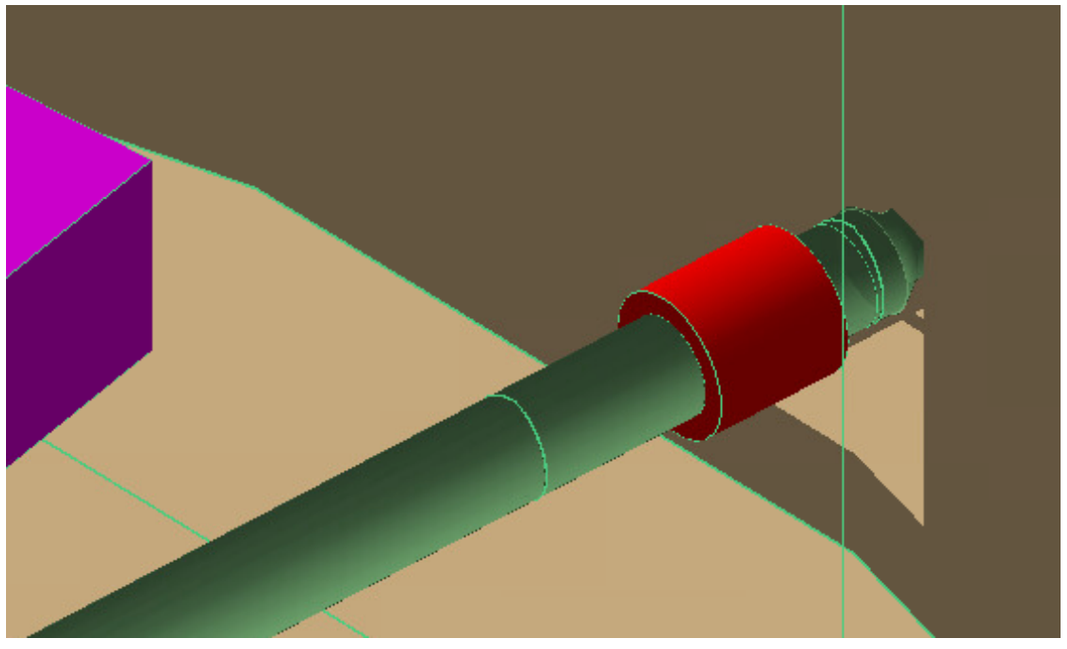


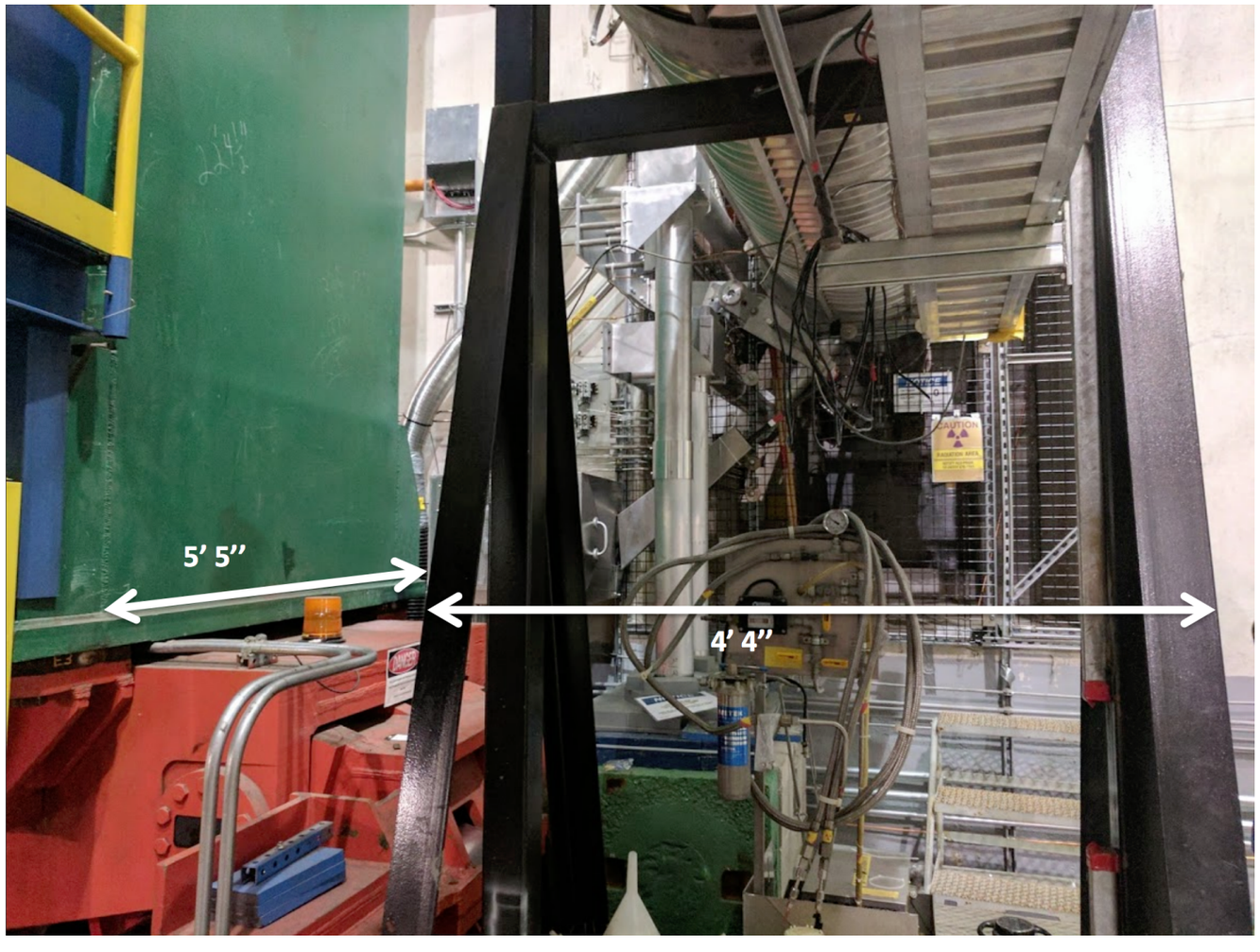


PREX2 - comparison

current setup + donut shield:

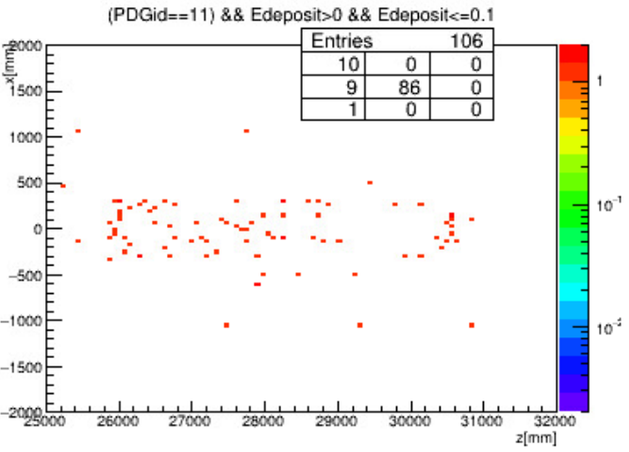
* 131 cm in z
* 20 cm in r (46 to 66 cm)
* DS edge ~50 cm from the edge of the hall (would require some refinement to fit in)

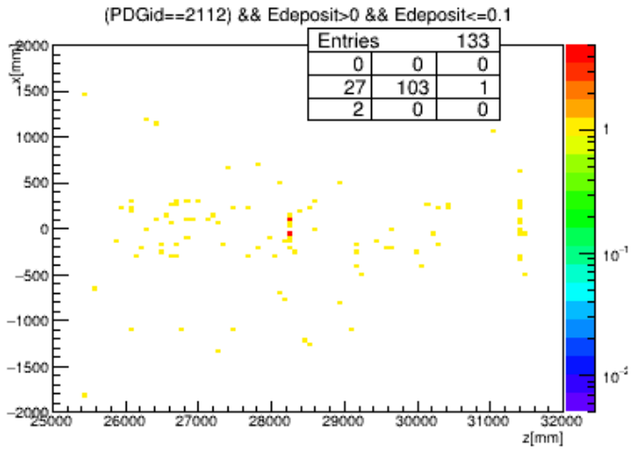


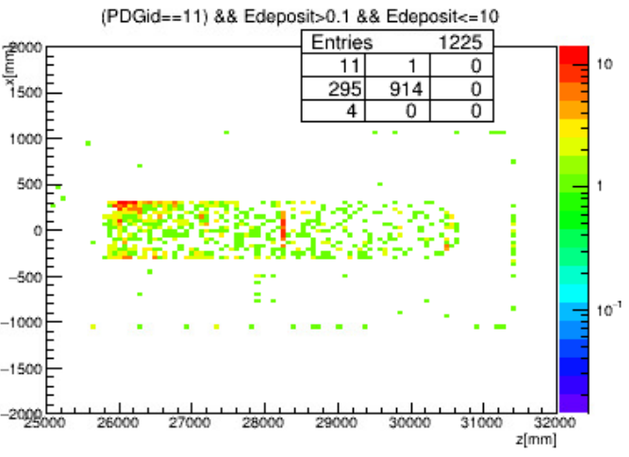


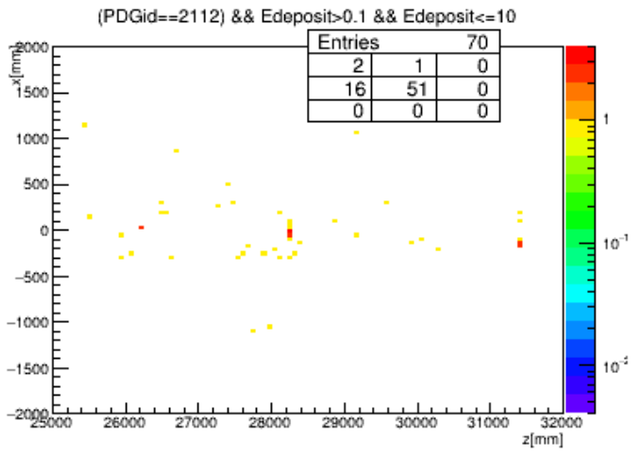
PREX2 - comparison

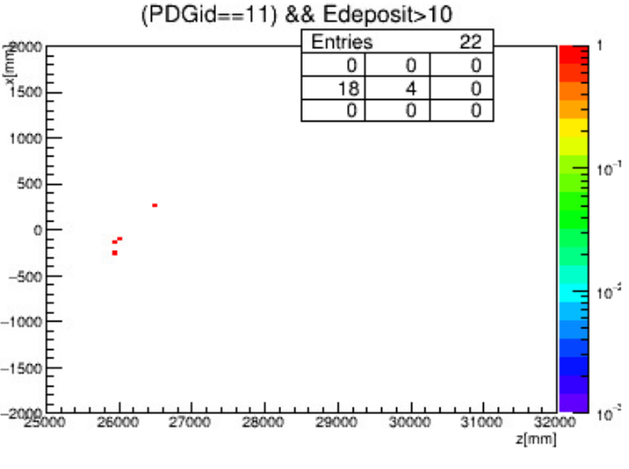
current setup

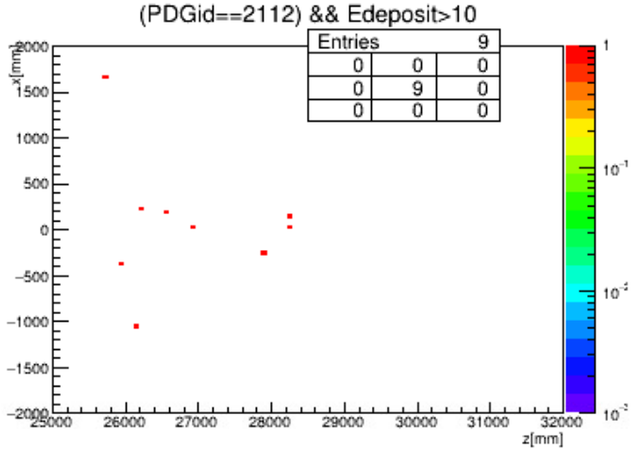




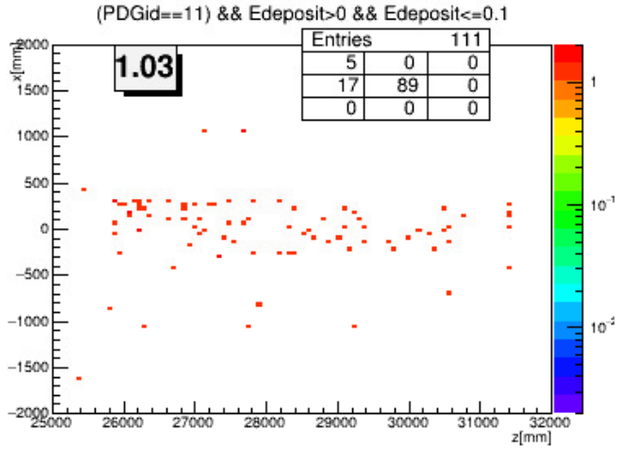


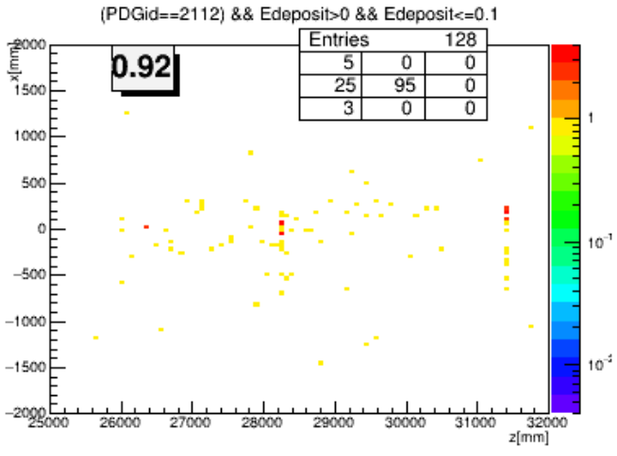


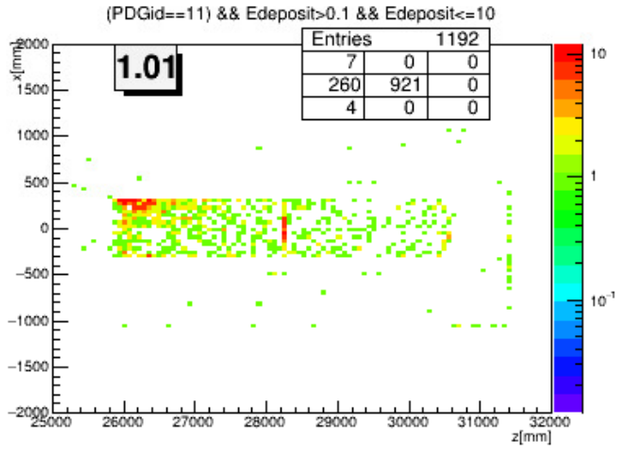


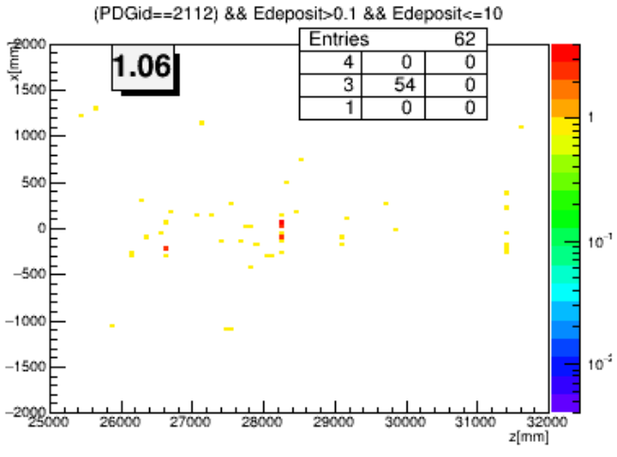


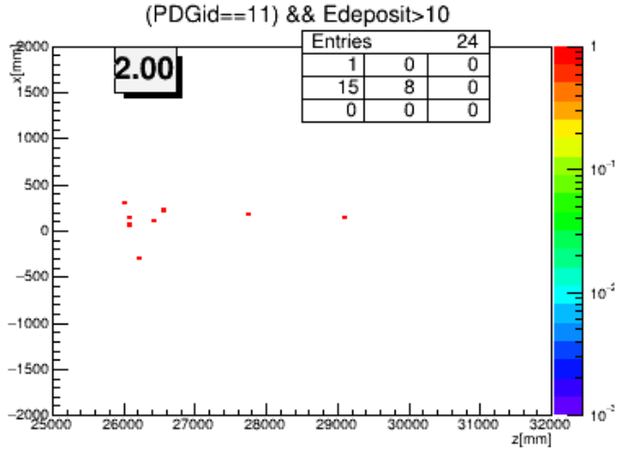
current setup + donut shield

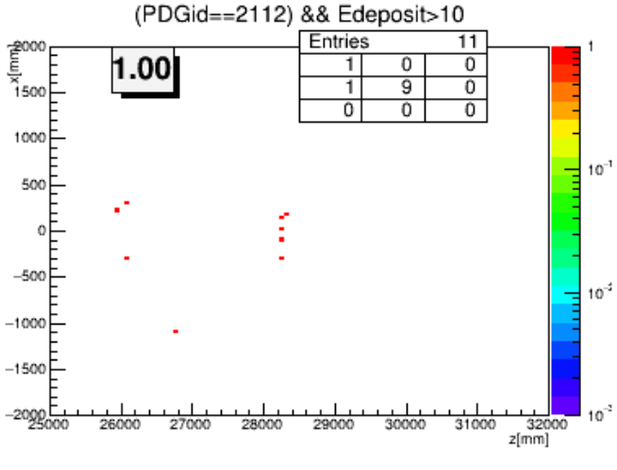






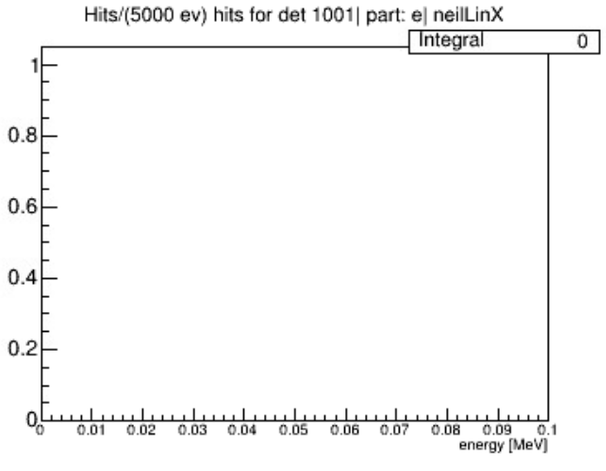


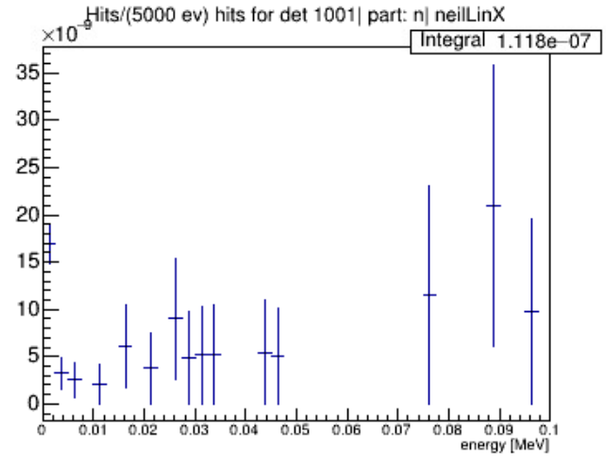


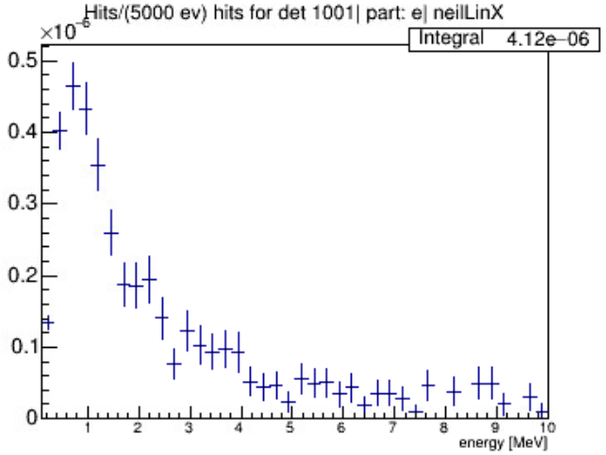


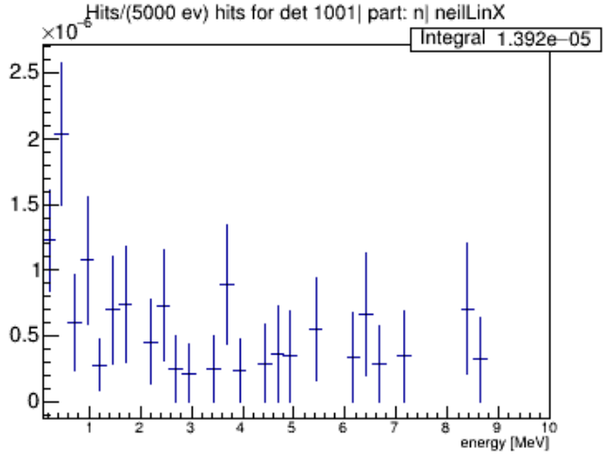
PREX2 - comparison

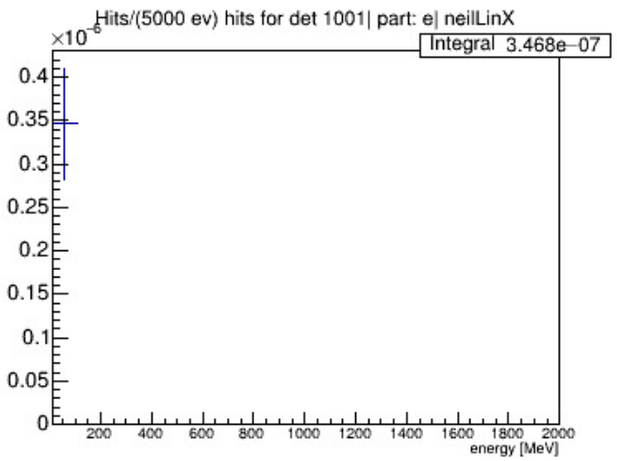
current setup

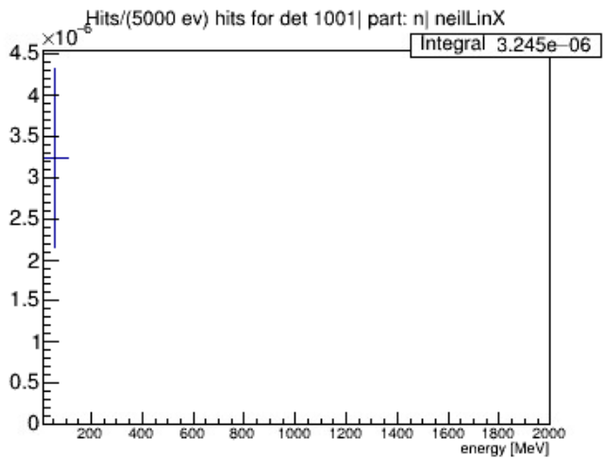




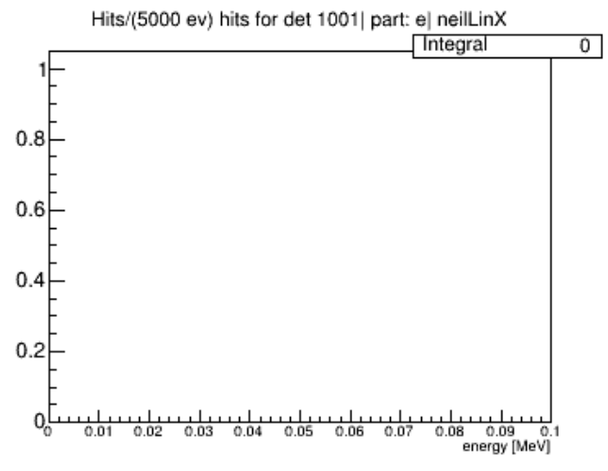


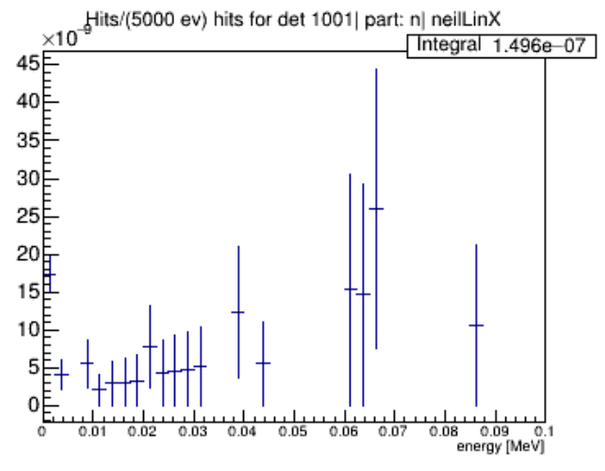


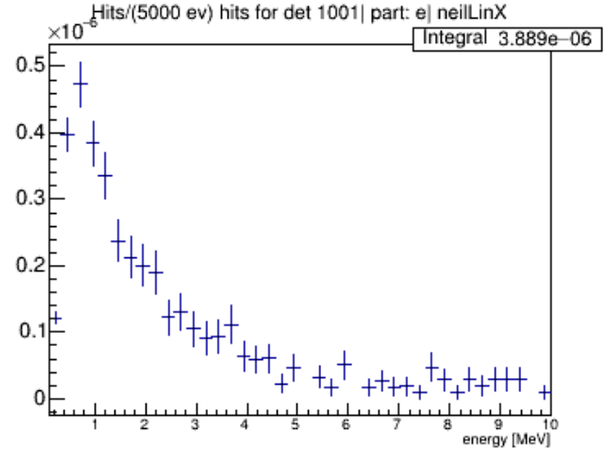


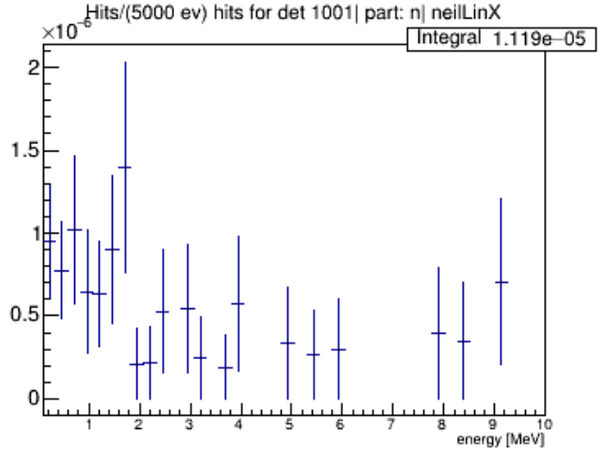


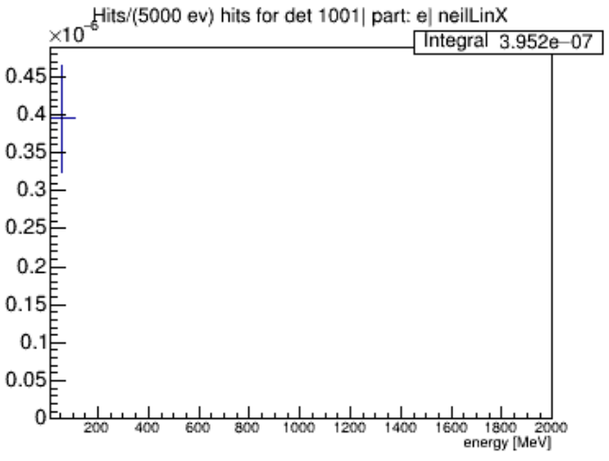
current setup + donut shield

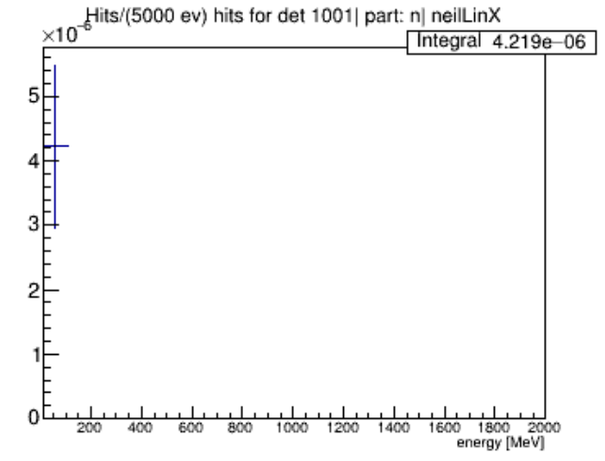






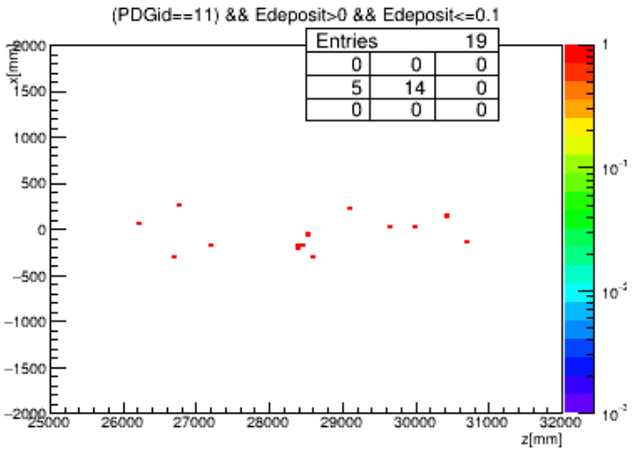


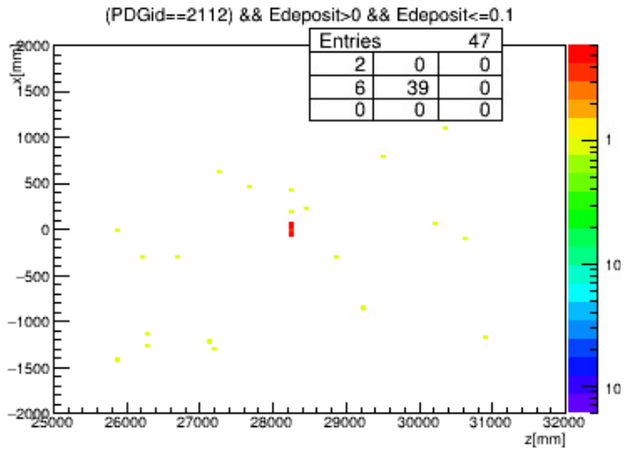


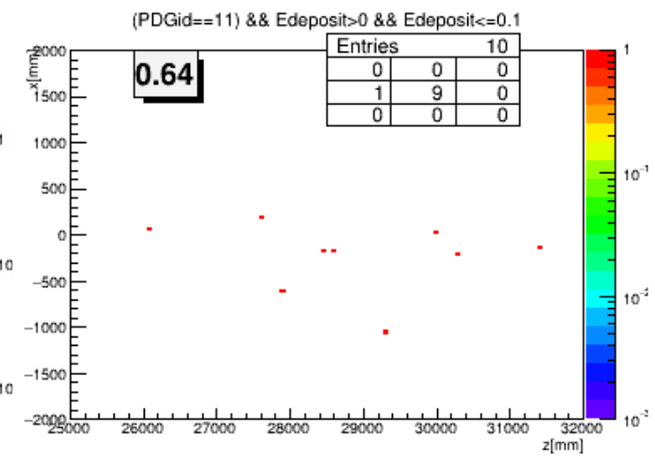


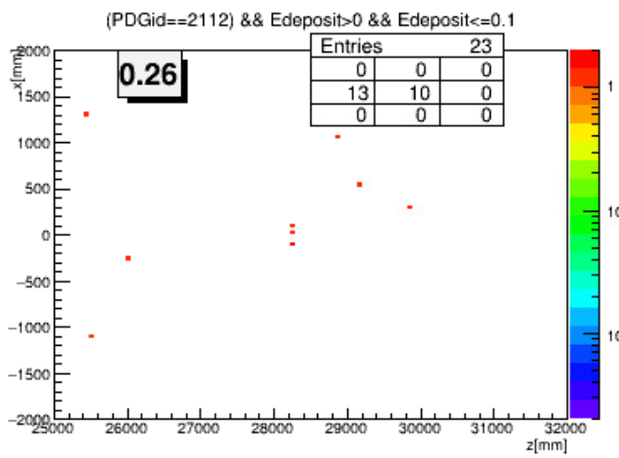
CREX - comparison

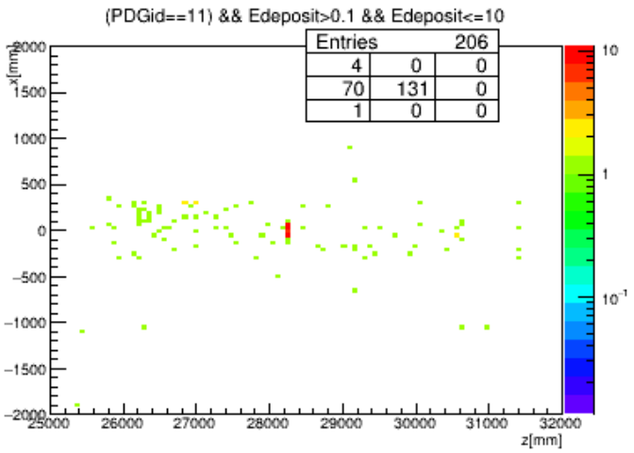
current setup

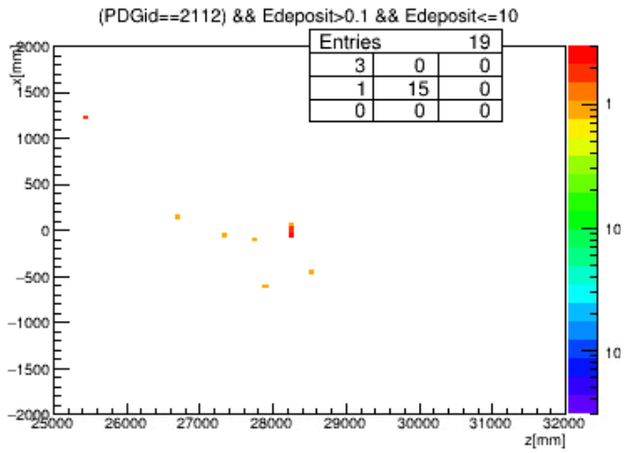


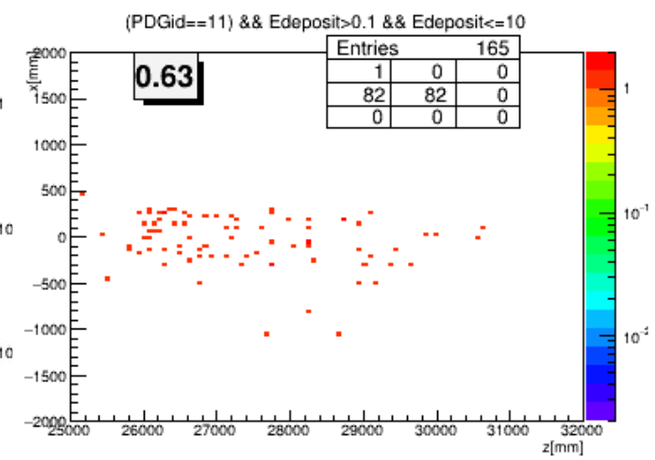


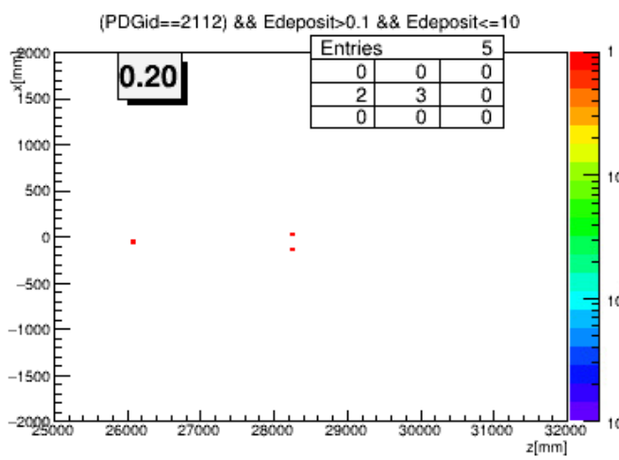




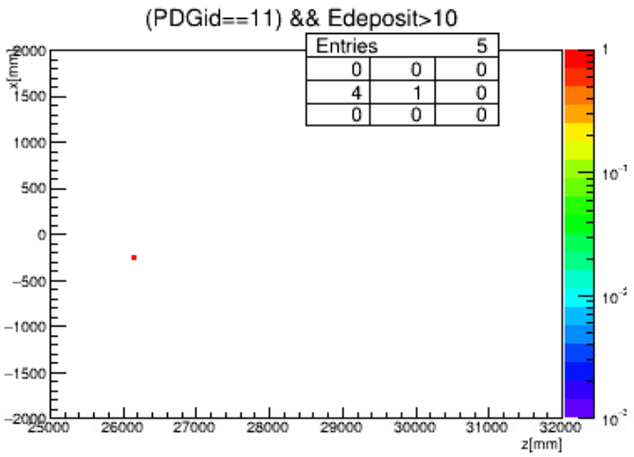


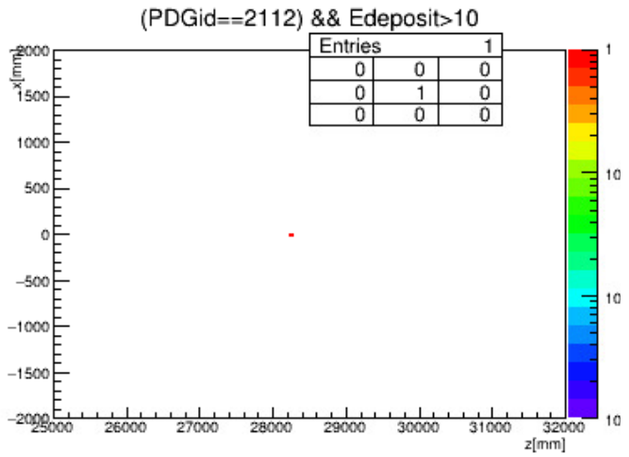


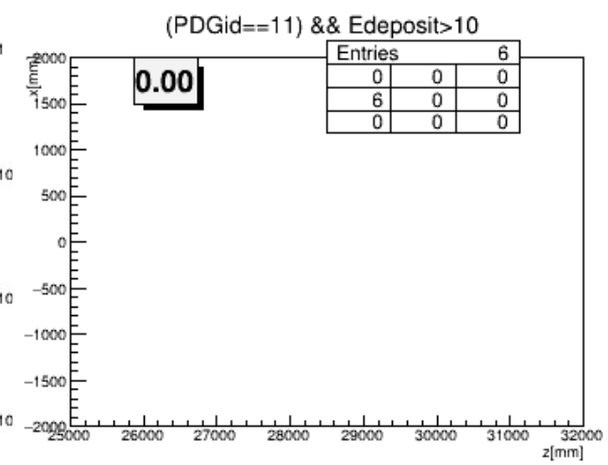


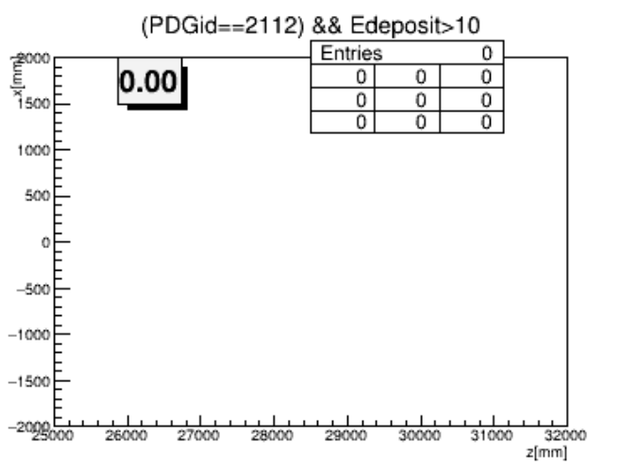


current setup + 4 in donut



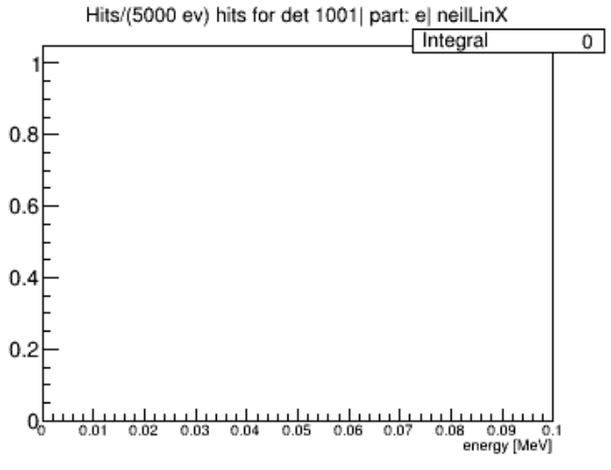


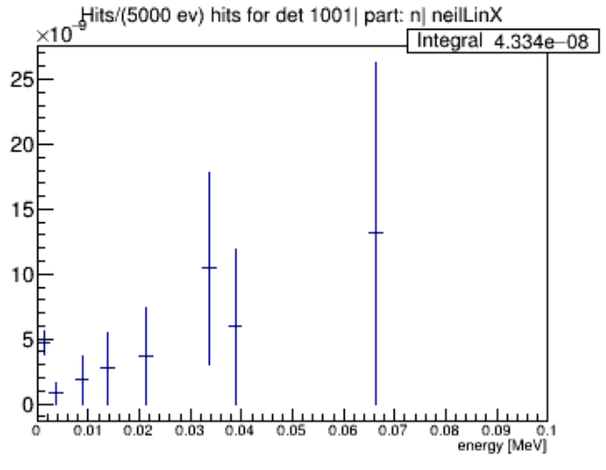


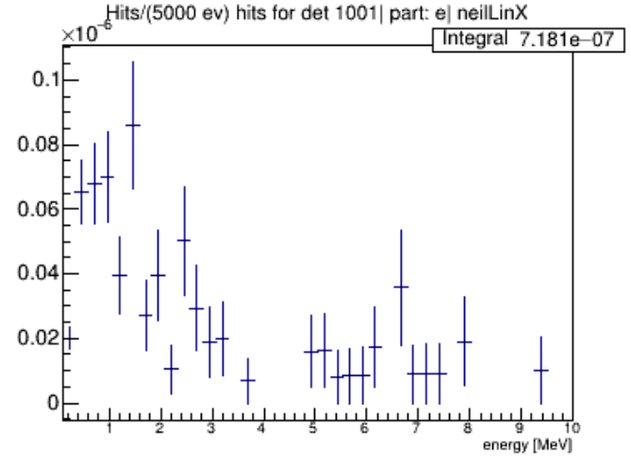


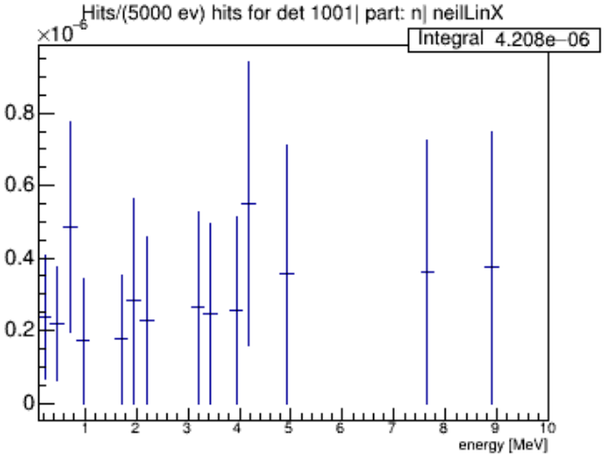
CREX - comparison

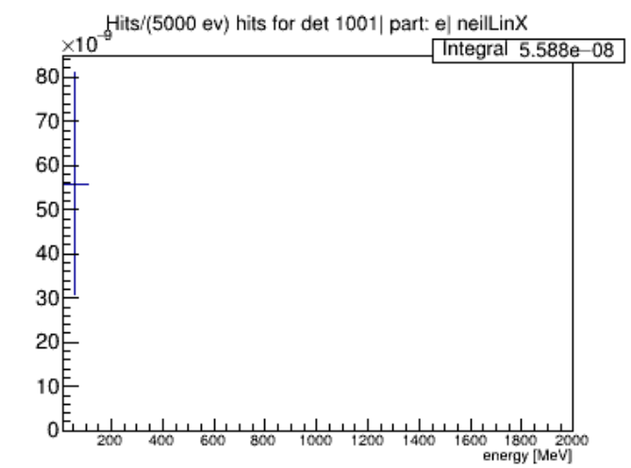
current setup

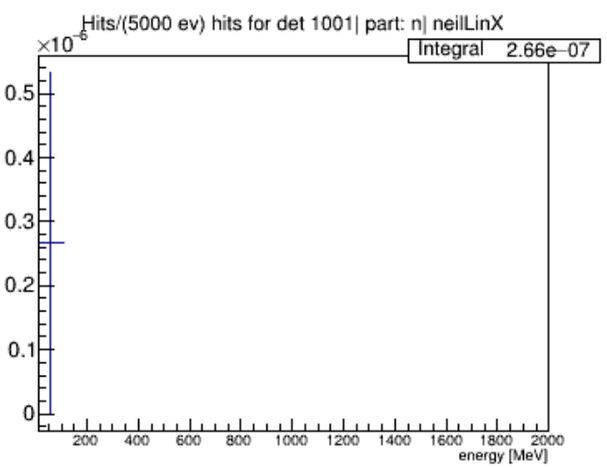




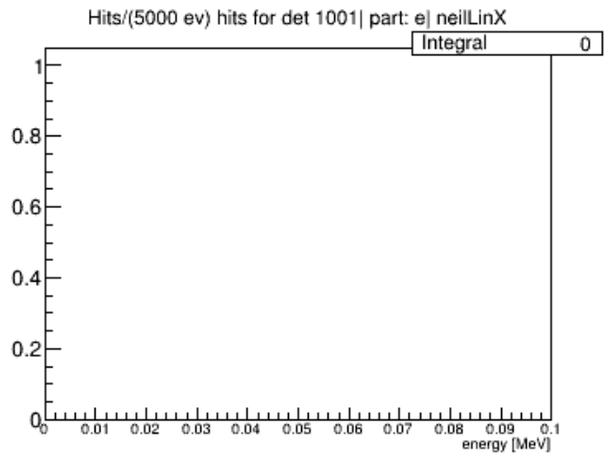


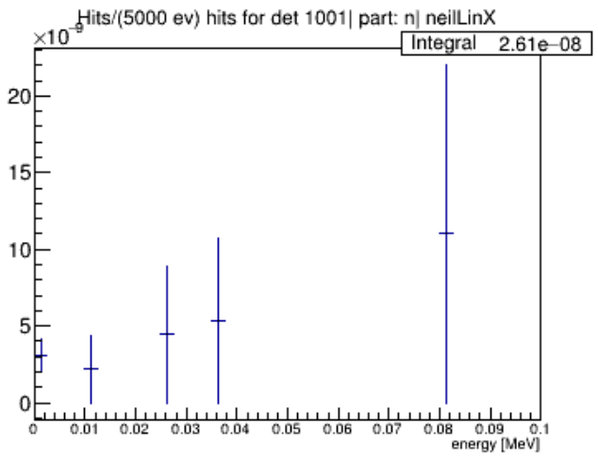


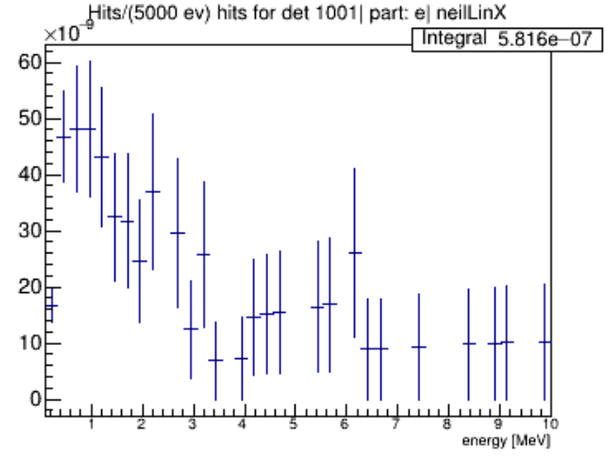


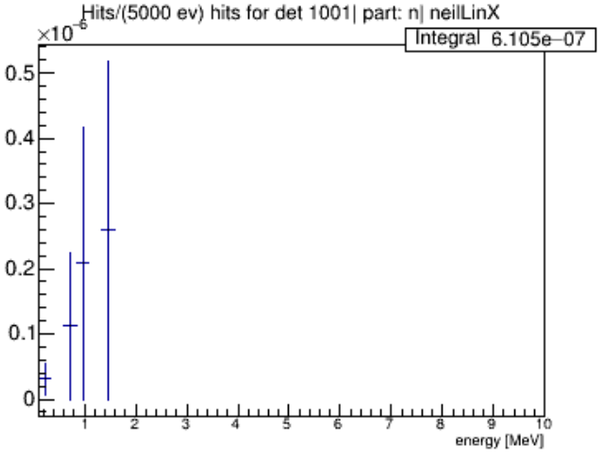


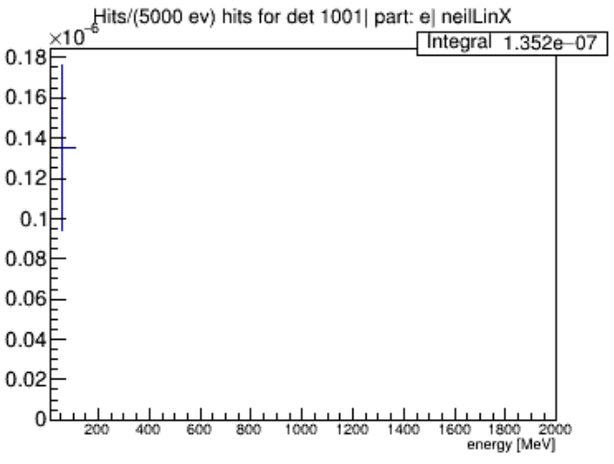
current setup + 4 in donut

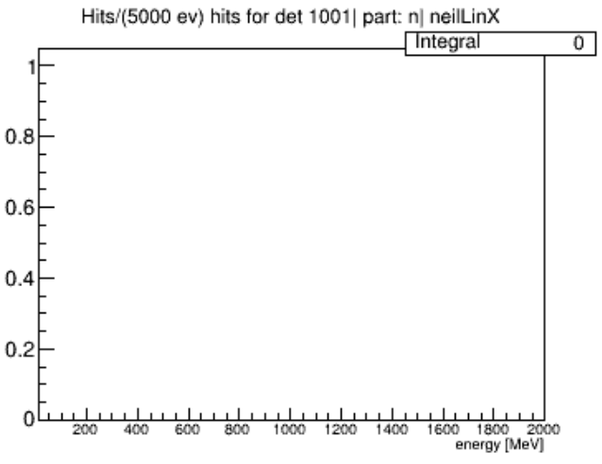








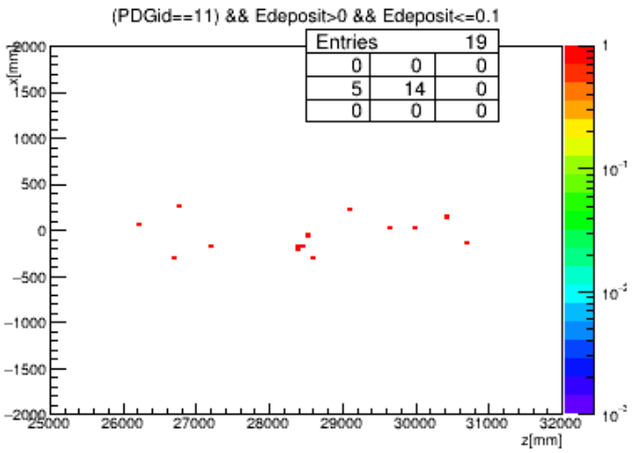


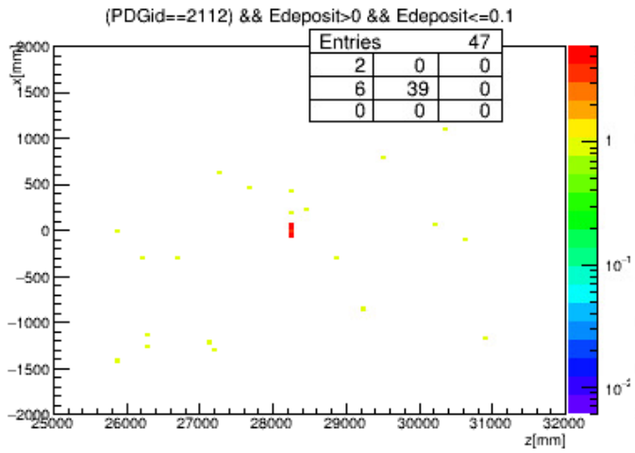


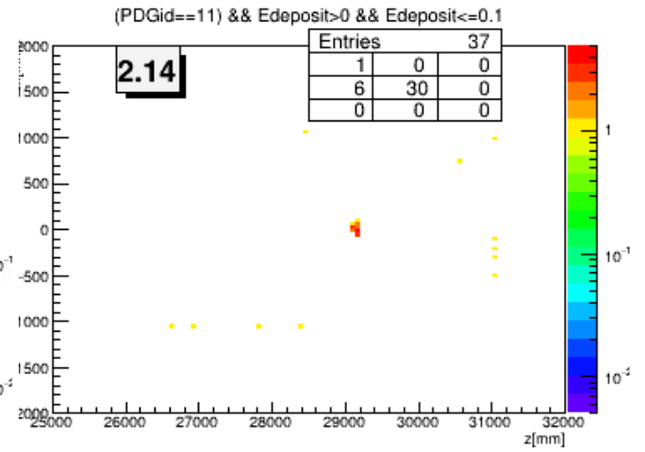
CREX - comparison

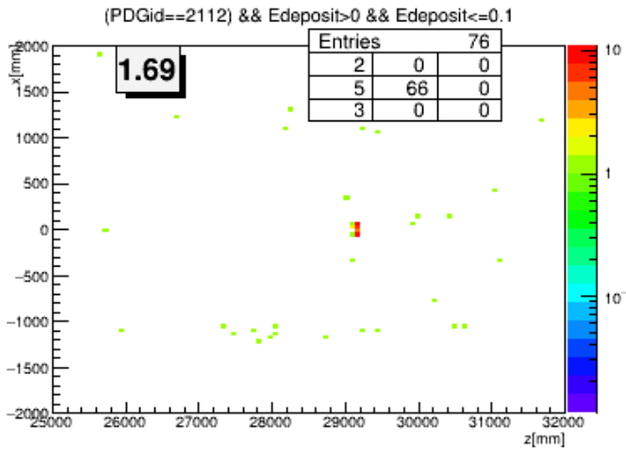
current setup

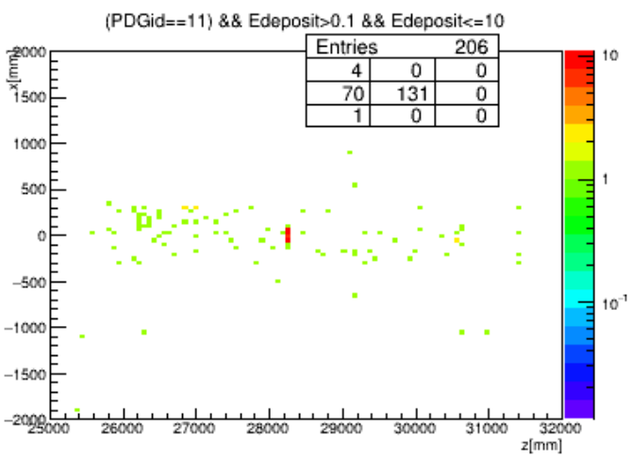
PREX1 dump setup

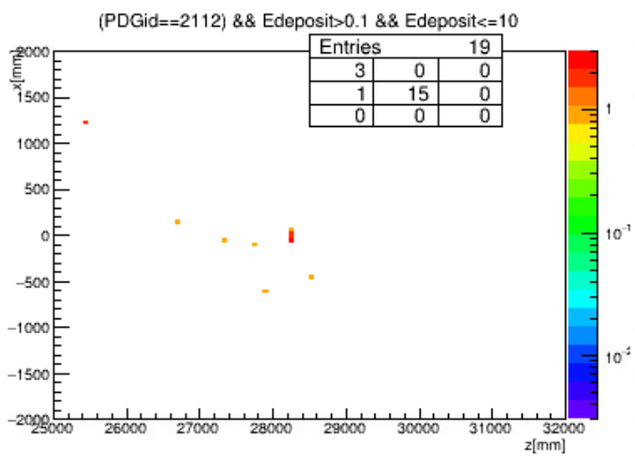


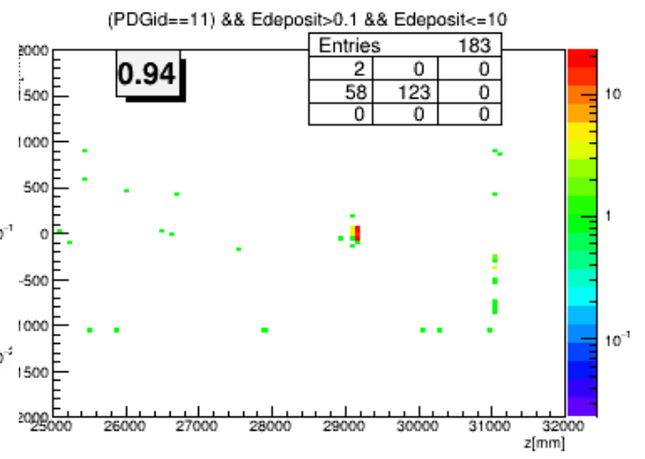


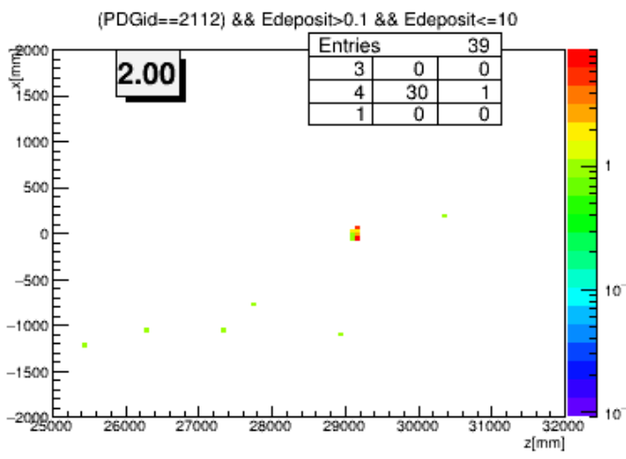


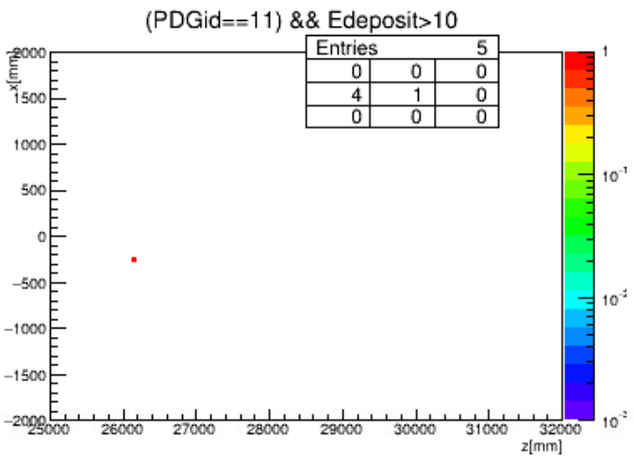


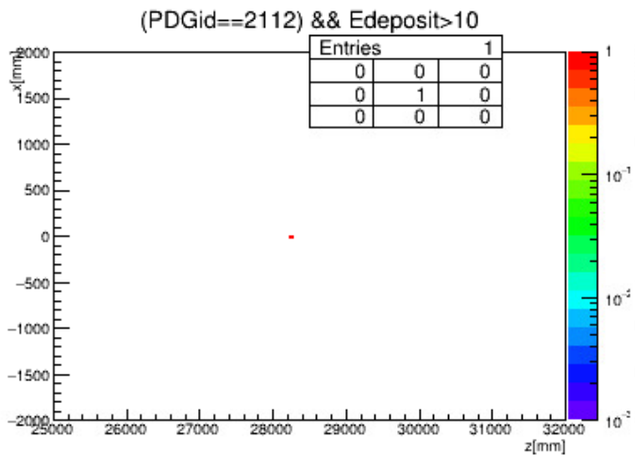


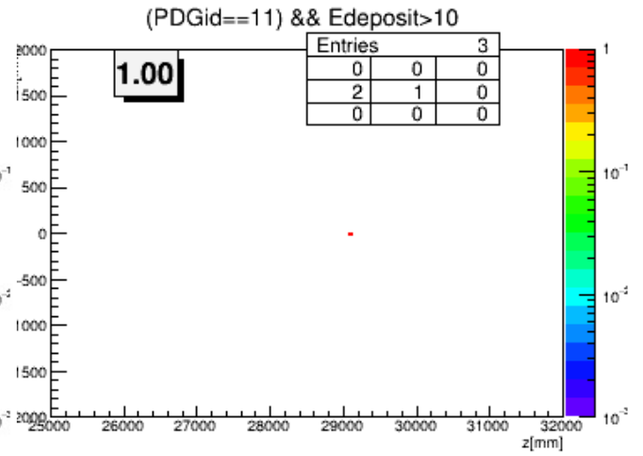


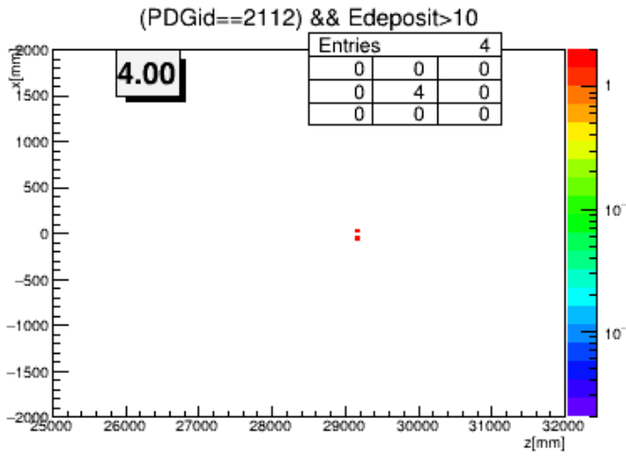






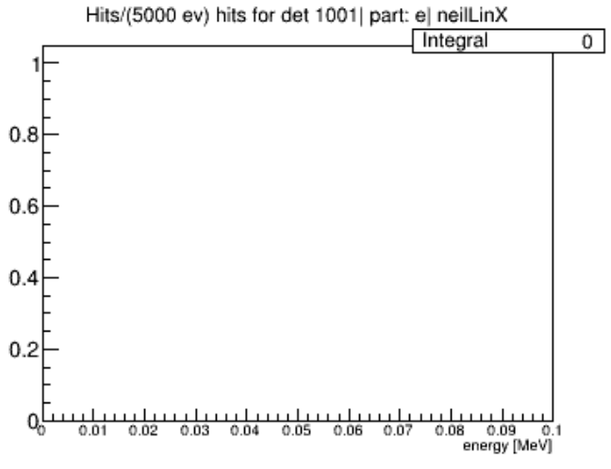


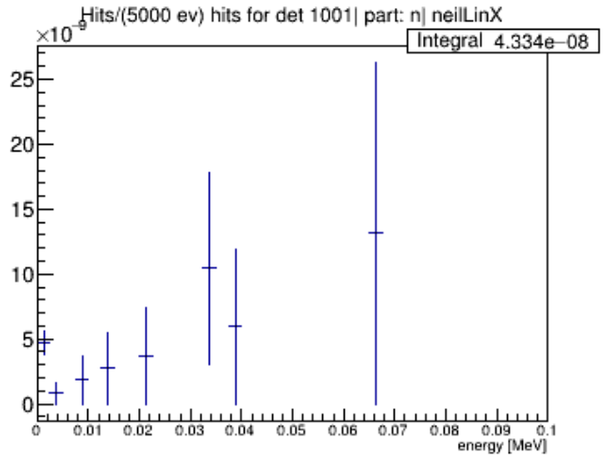


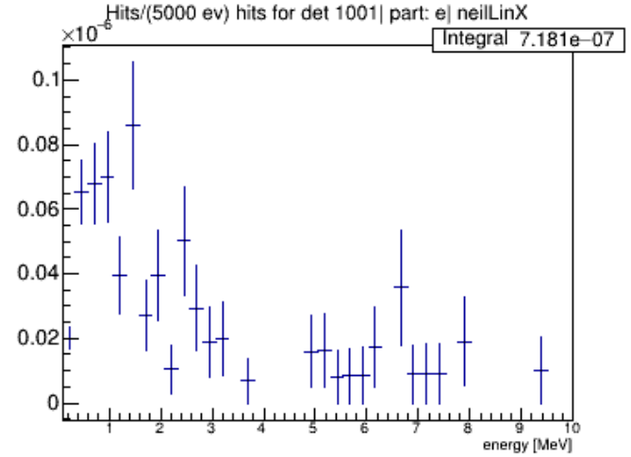


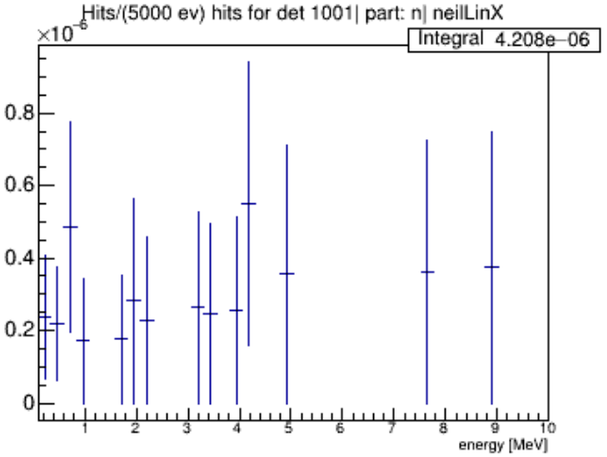
CREX - comparison

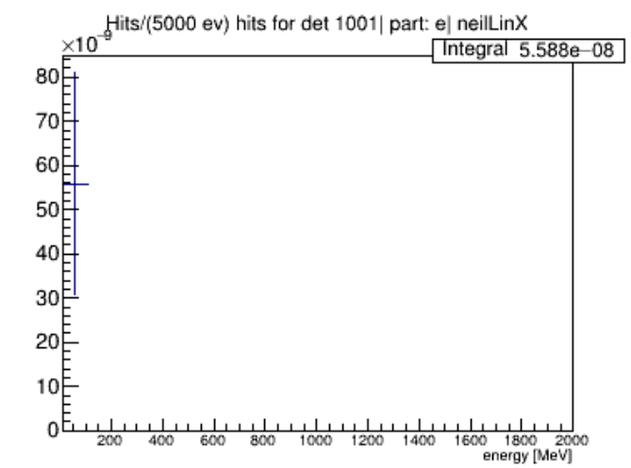
current setup

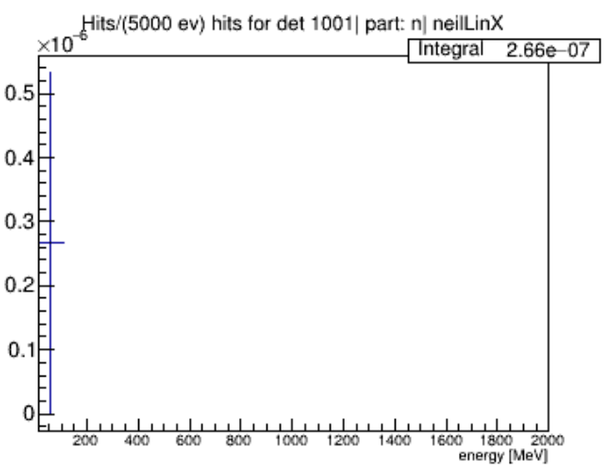




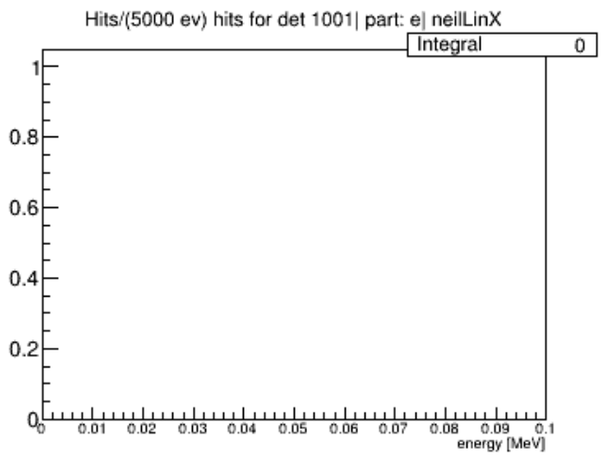


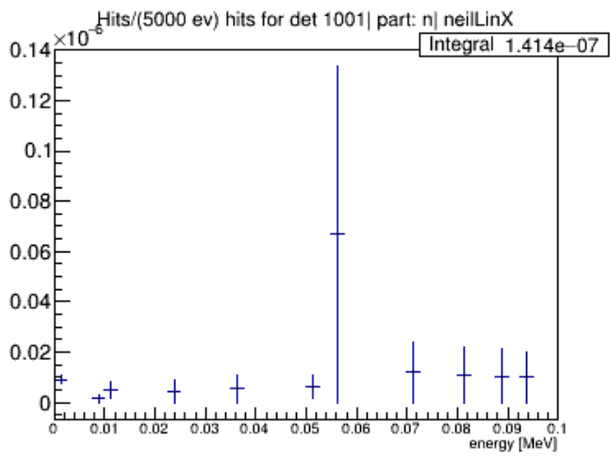


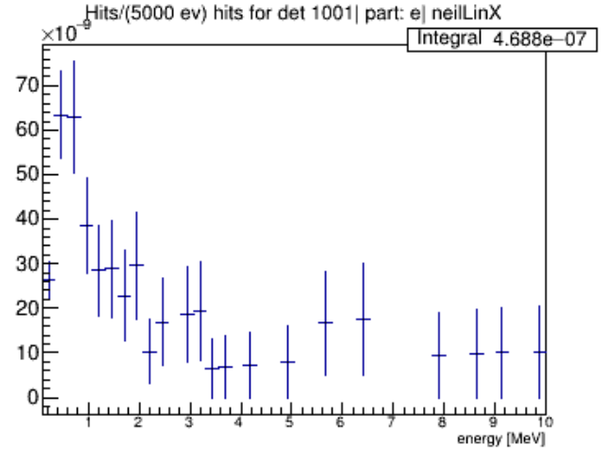


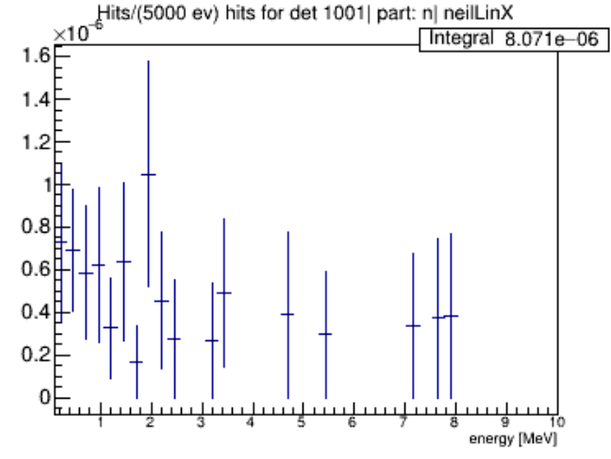


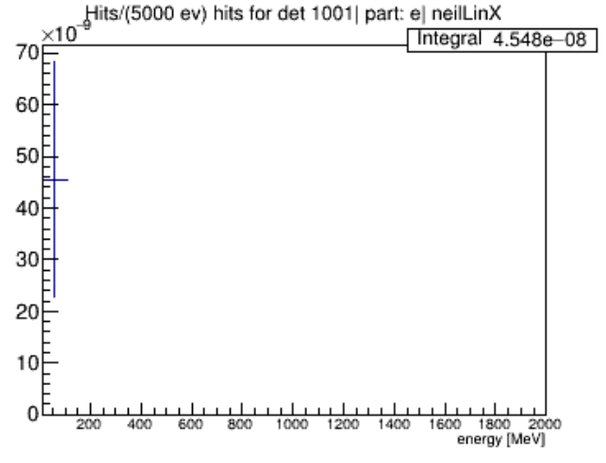
PREX1 dump setup

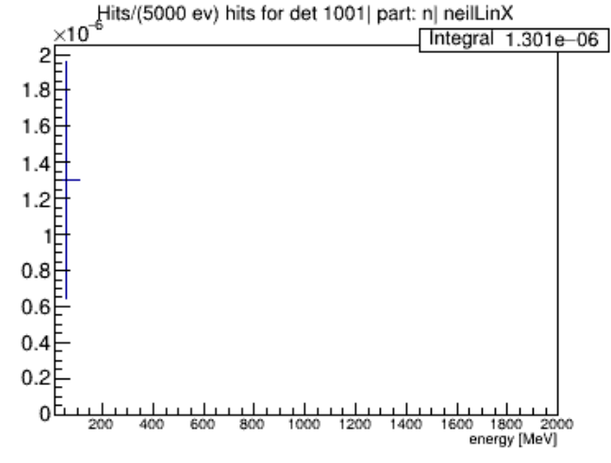






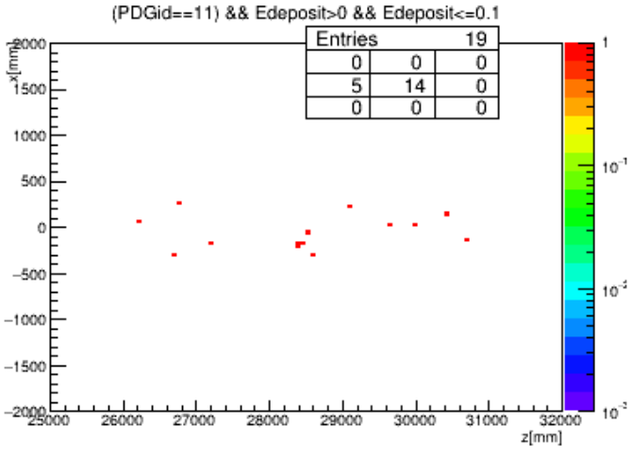


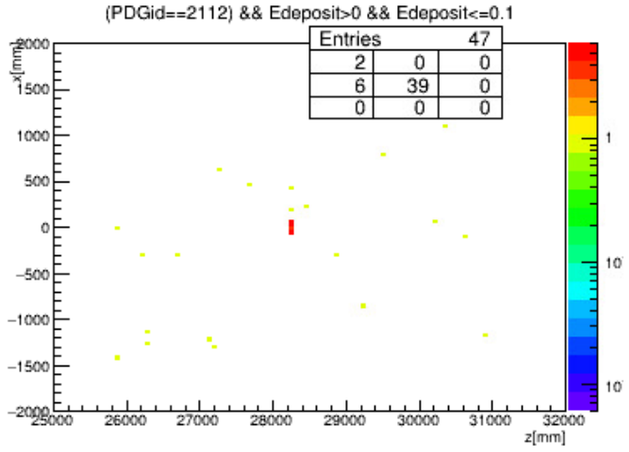


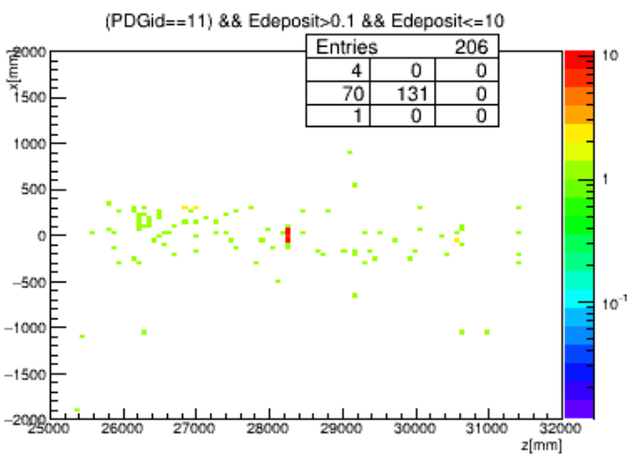


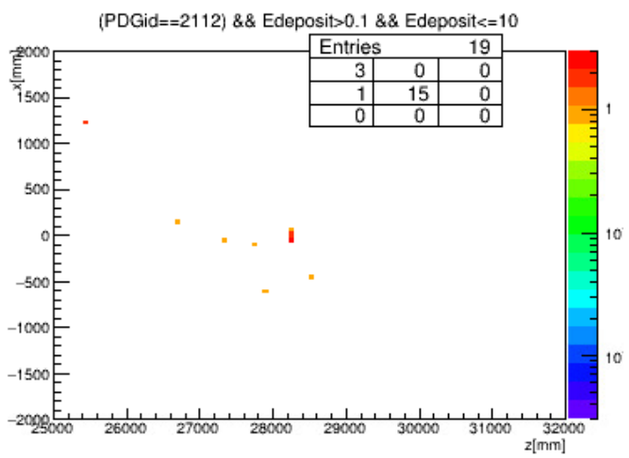
CREX - comparison

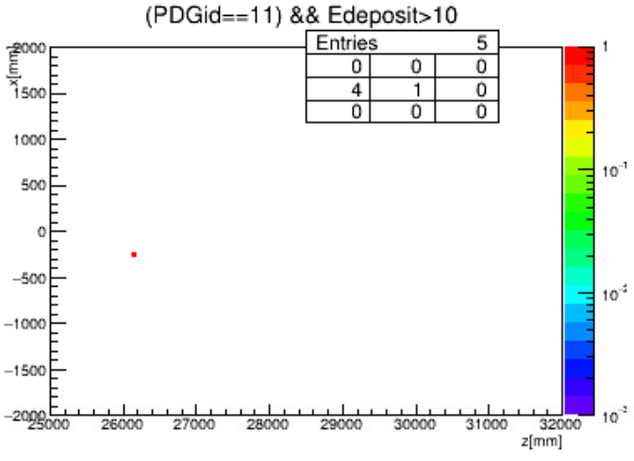
current setup

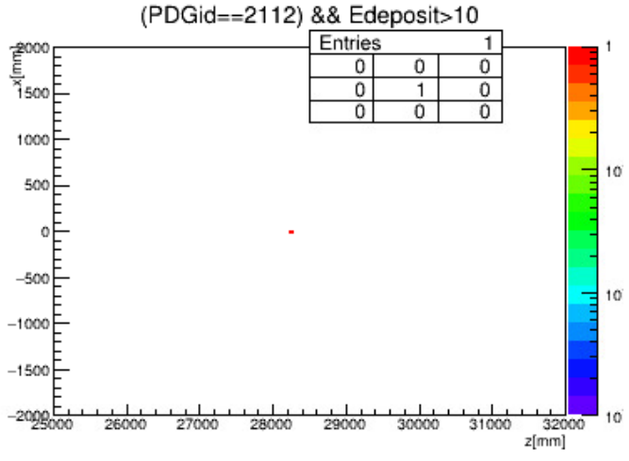




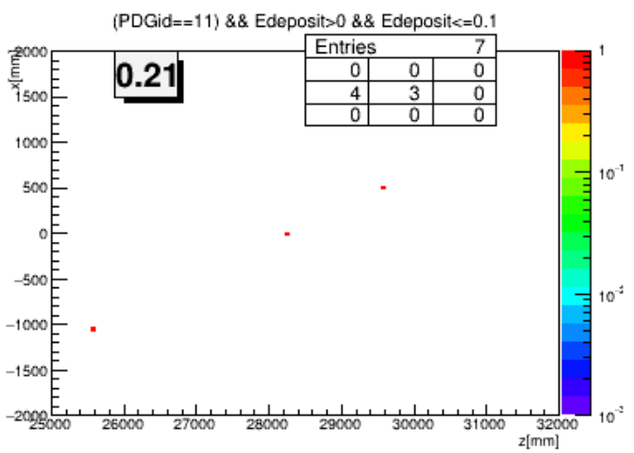


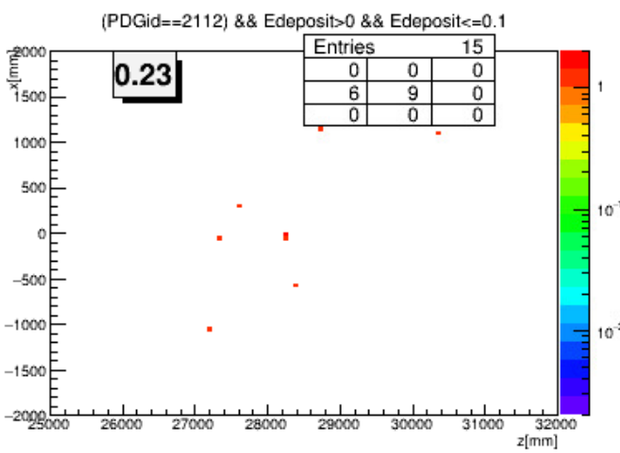


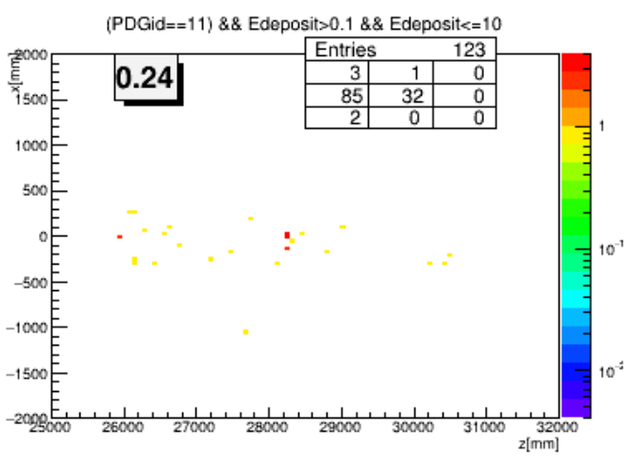


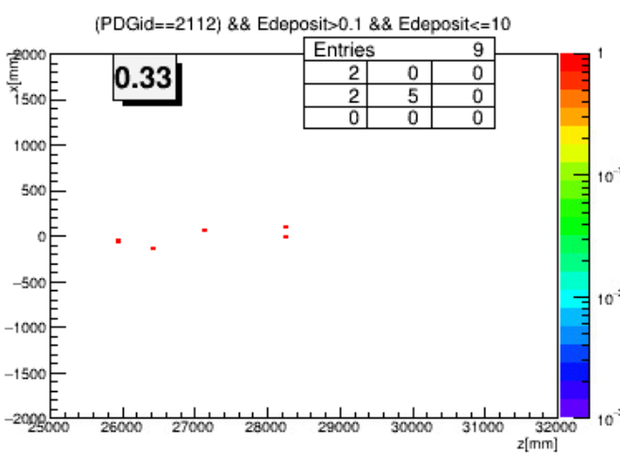


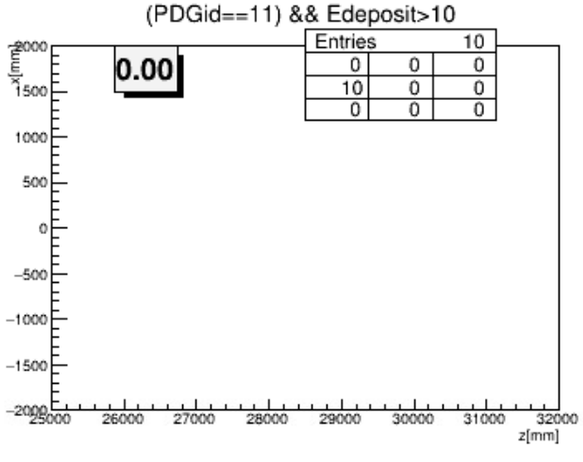
current setup + 1 ft concrete shield

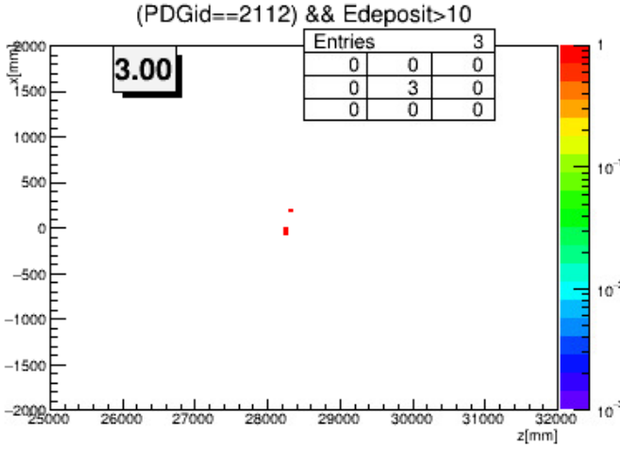






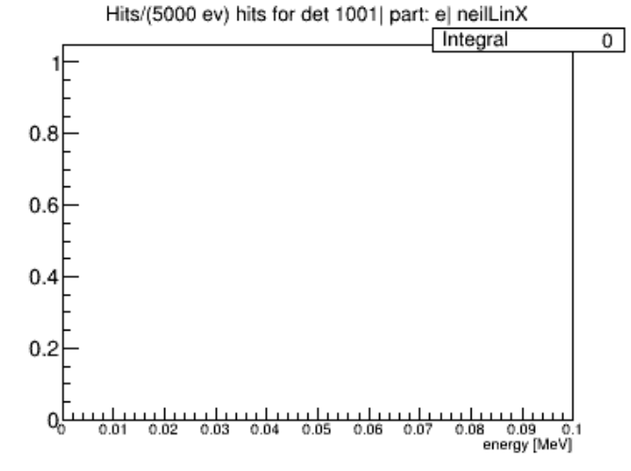


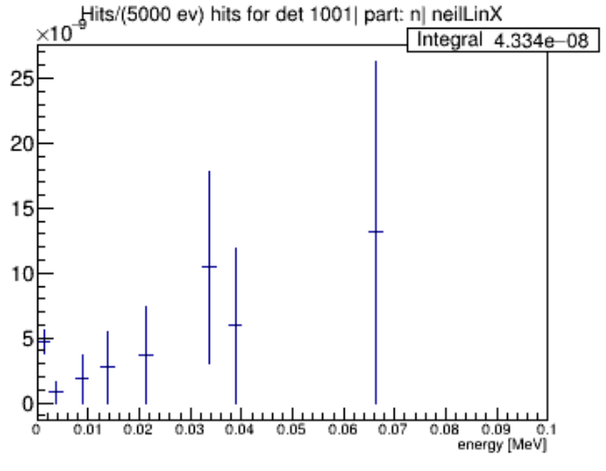


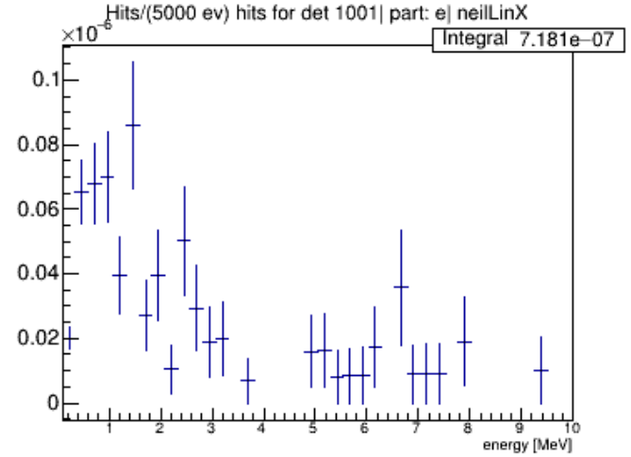


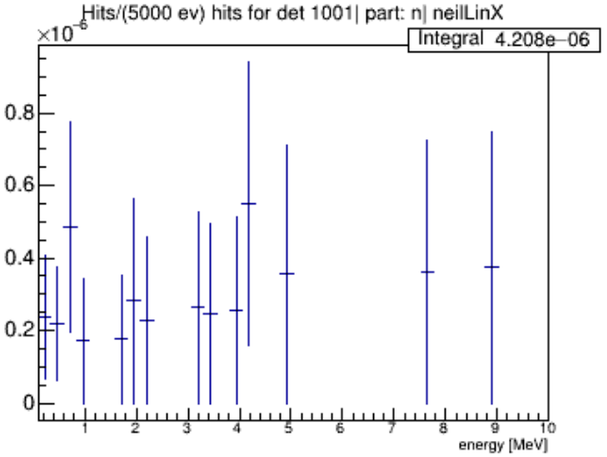
CREX - comparison

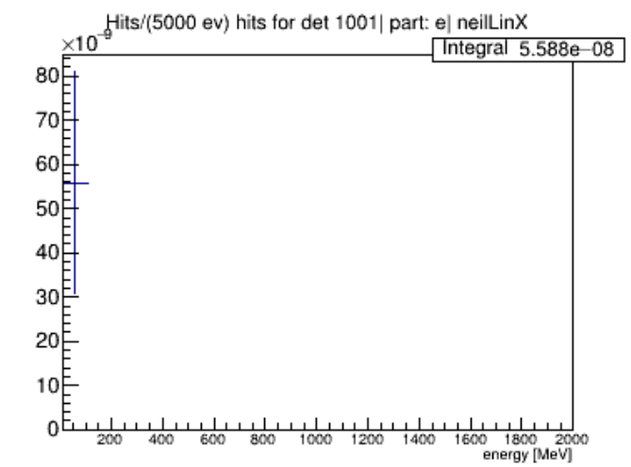
current setup

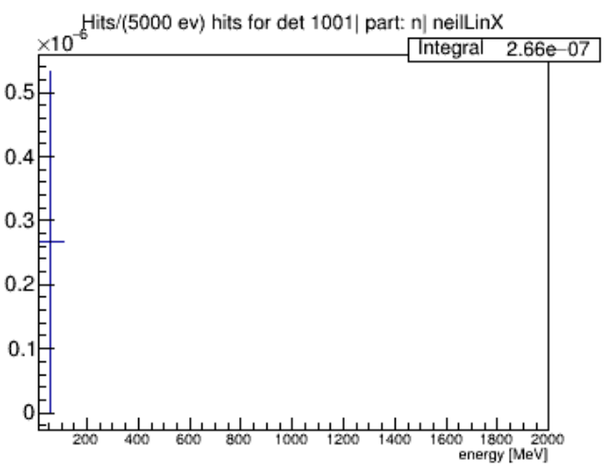




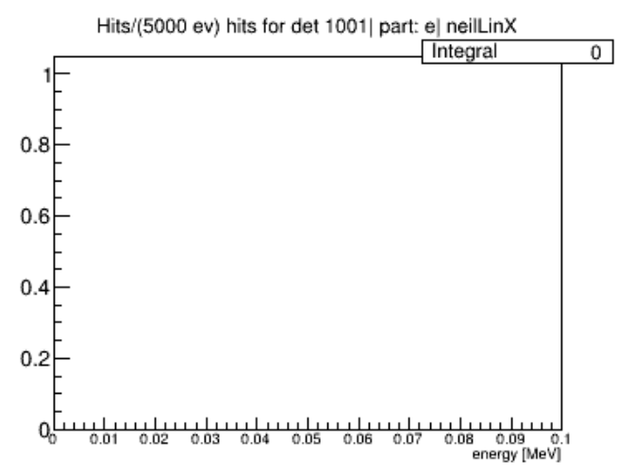


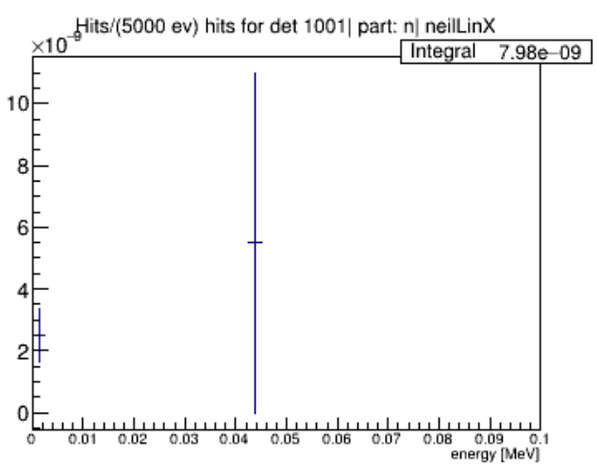


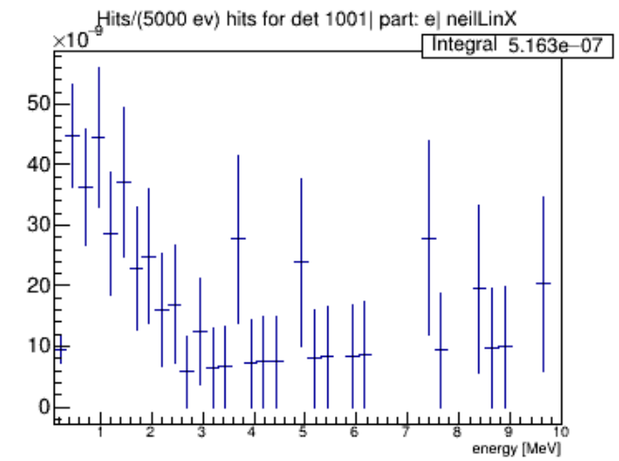


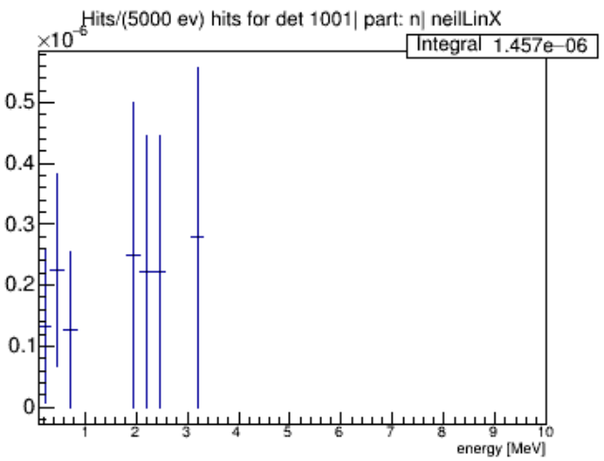


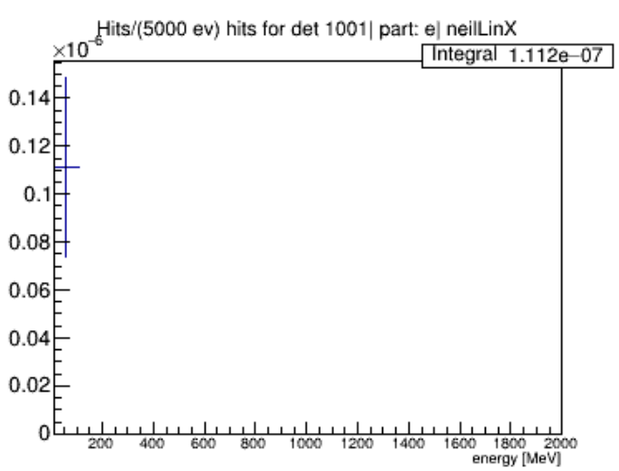
current setup + 1 ft concrete shield

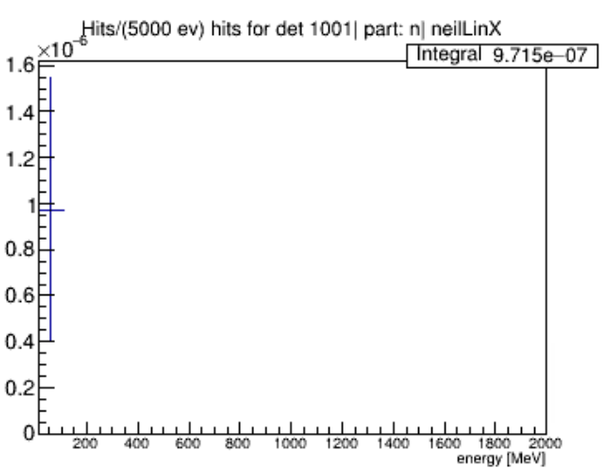






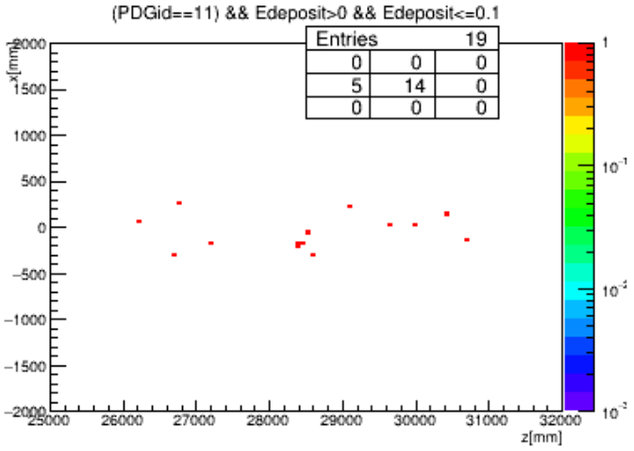


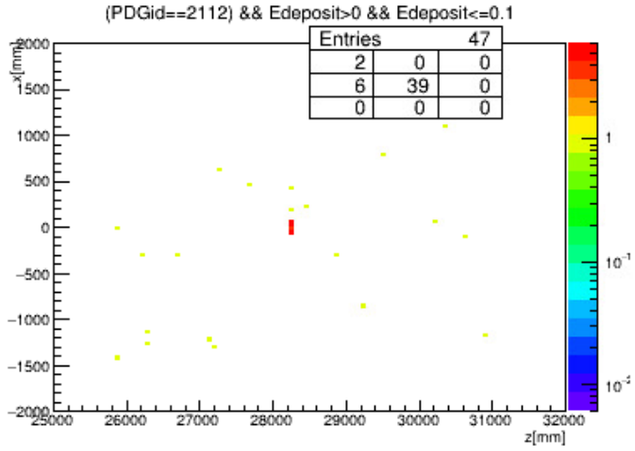


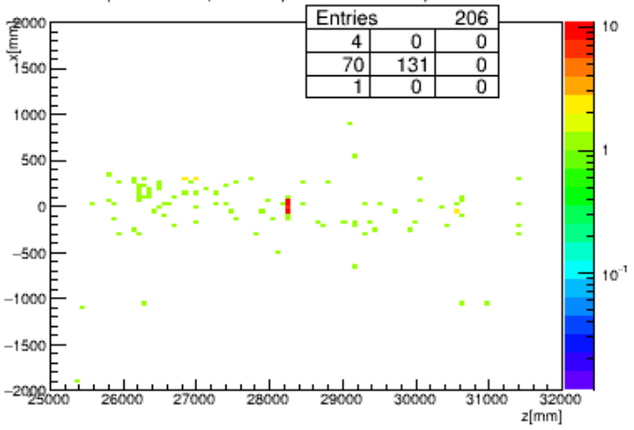


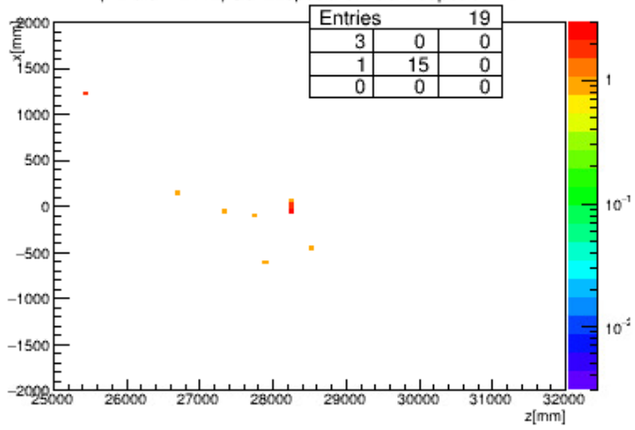
CREX - comparison

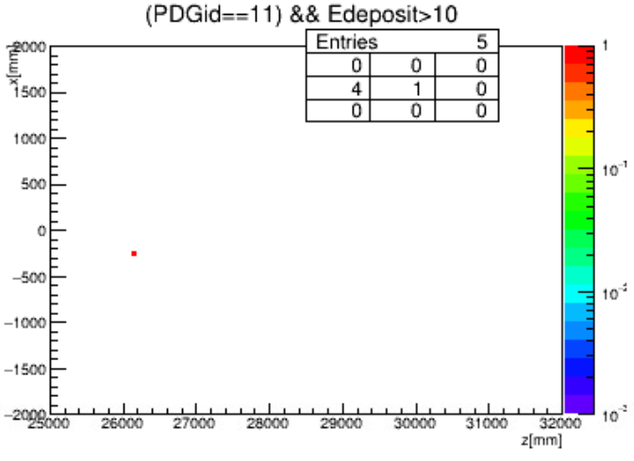
current setup

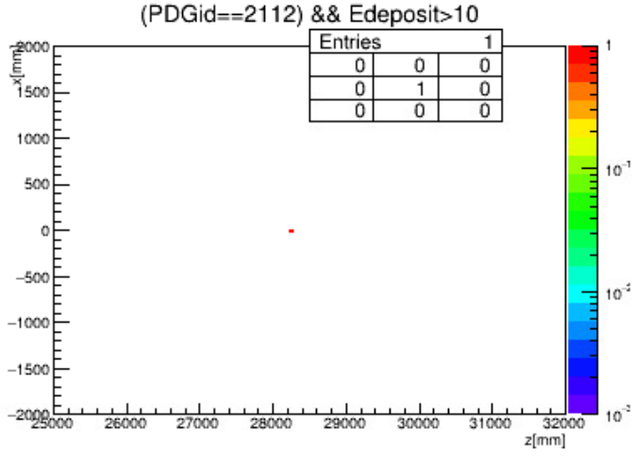




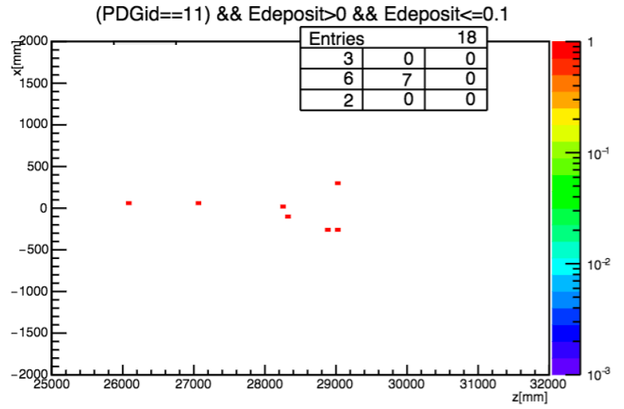


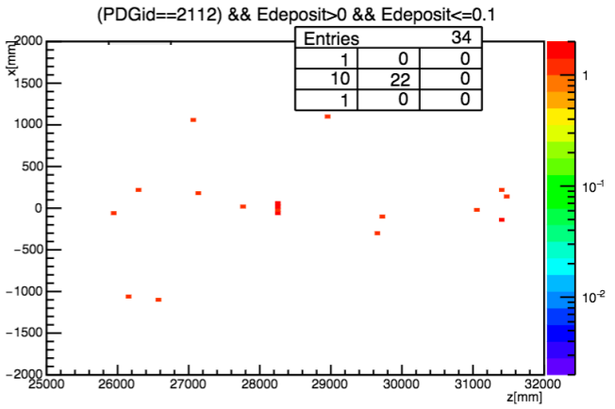


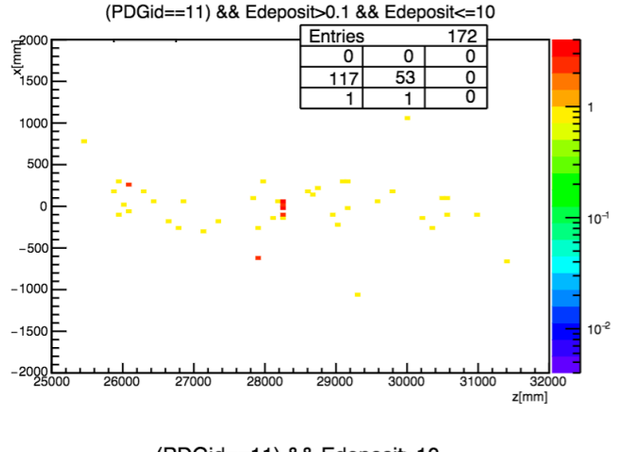


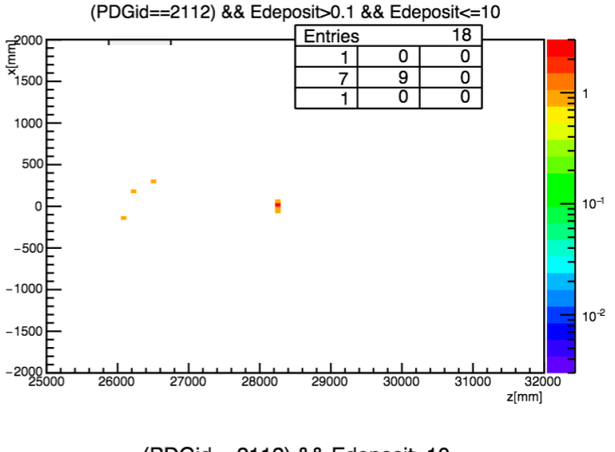


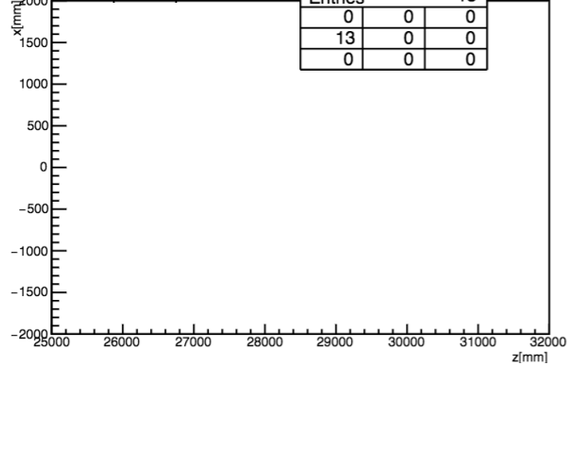
current setup + 2 ft concrete shield (2x stat)

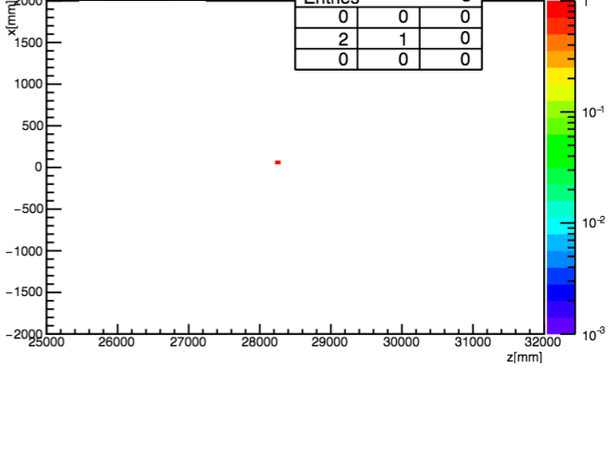






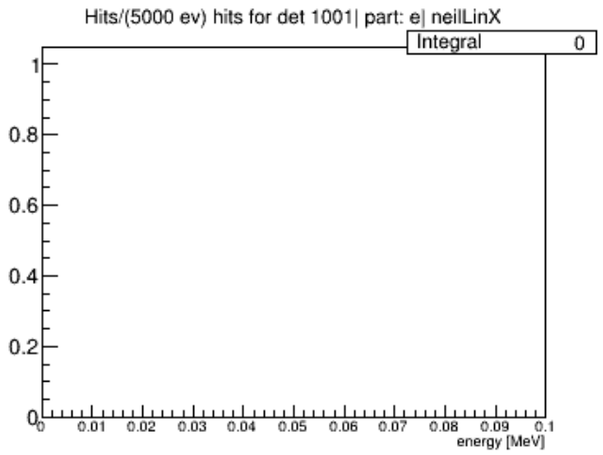


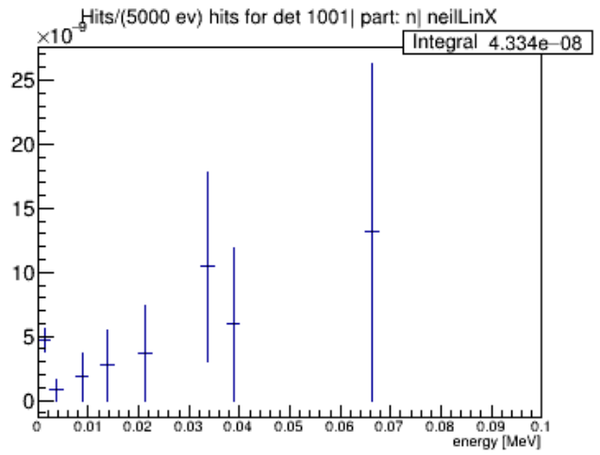


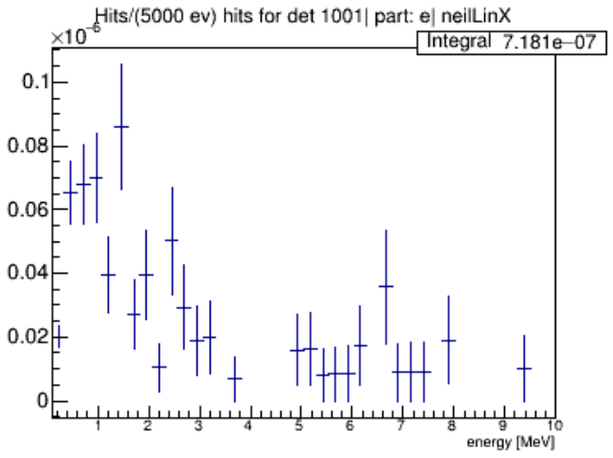


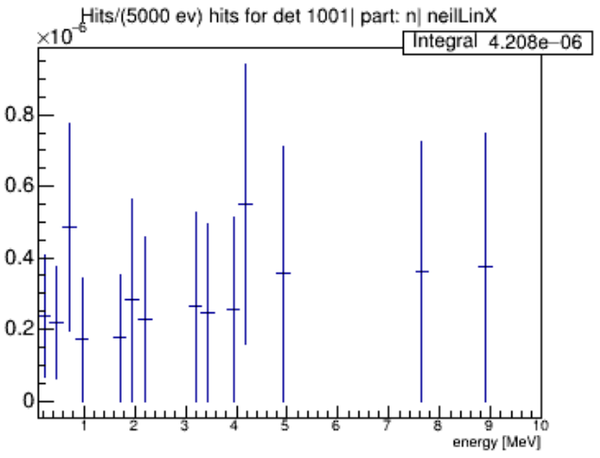
CREX - comparison

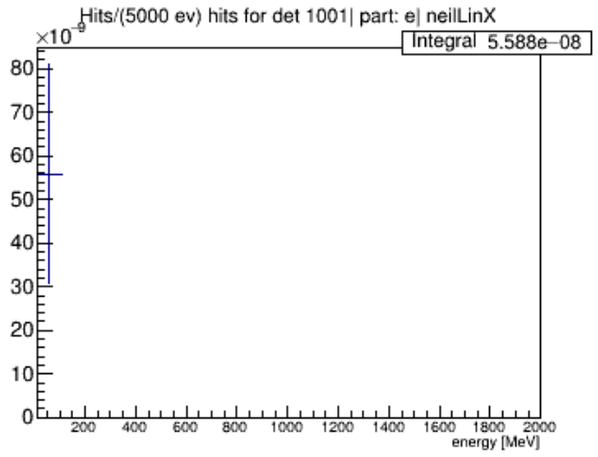
current setup

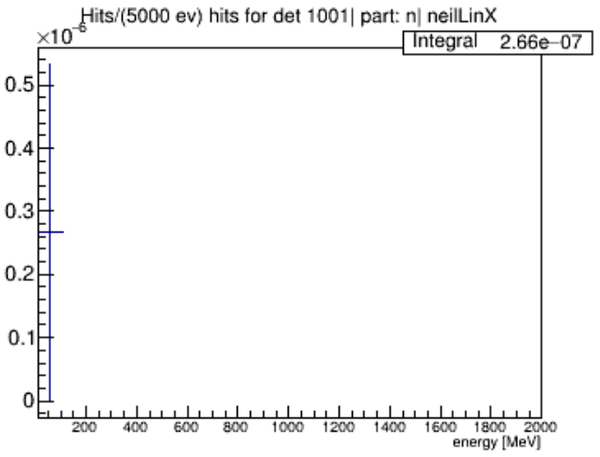




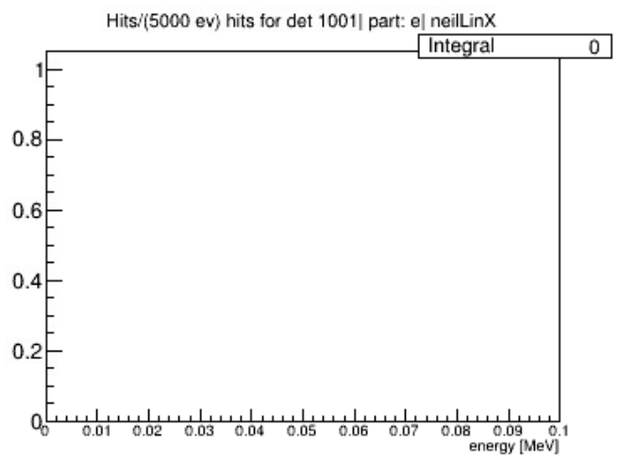


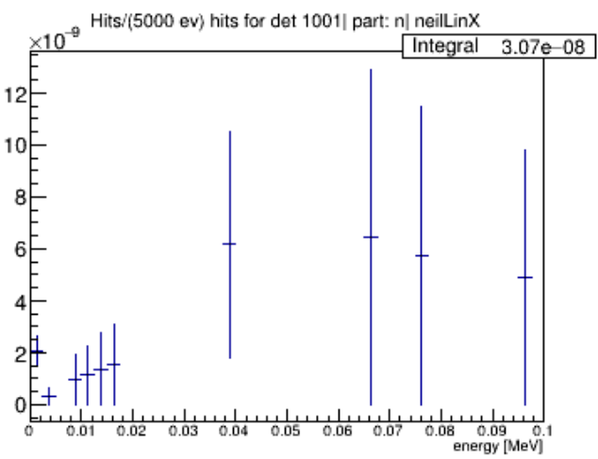


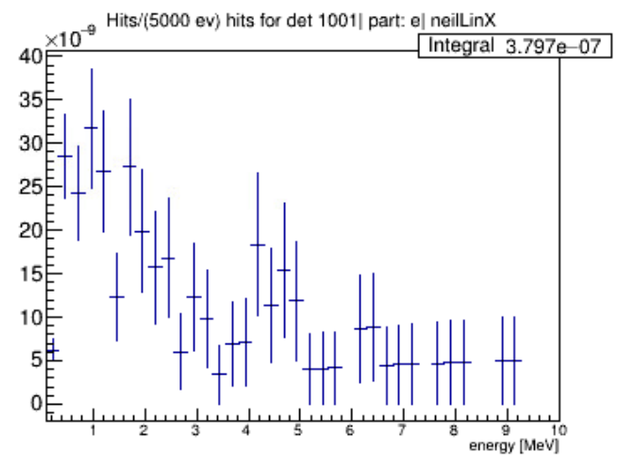


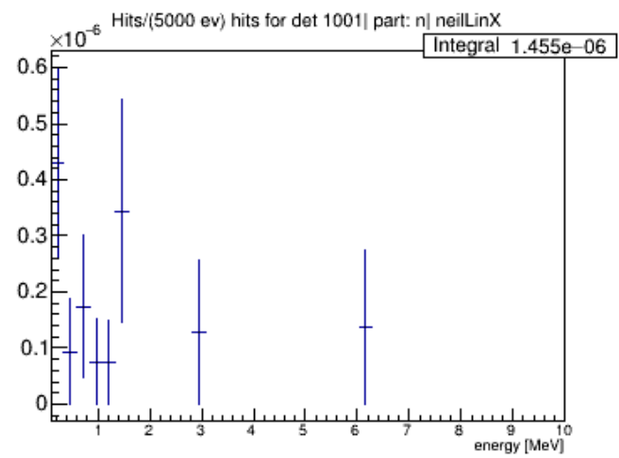


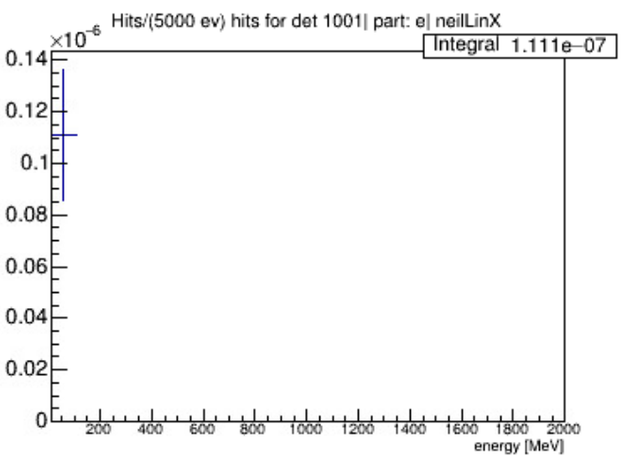
current setup + 2 ft concrete shield

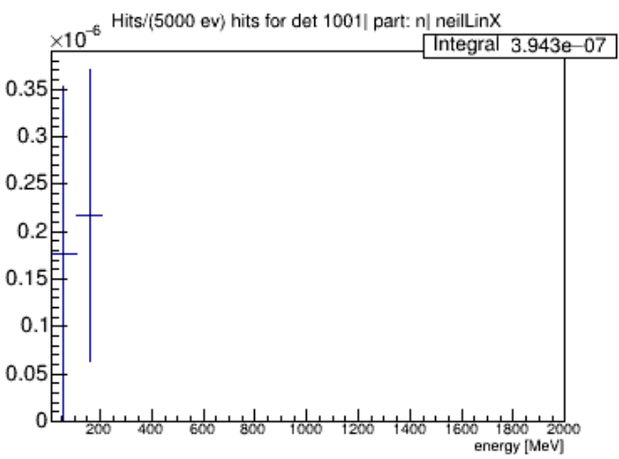






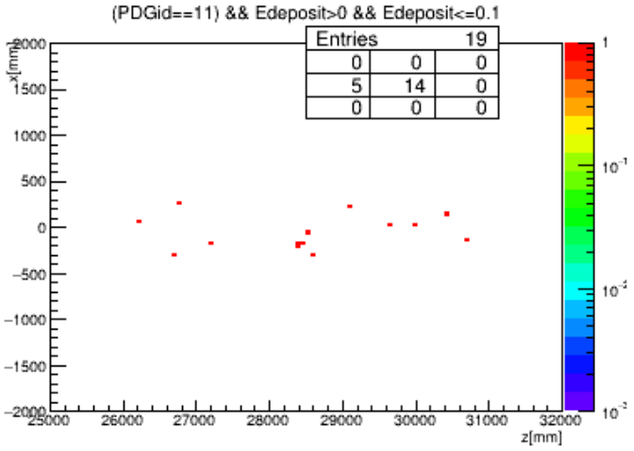


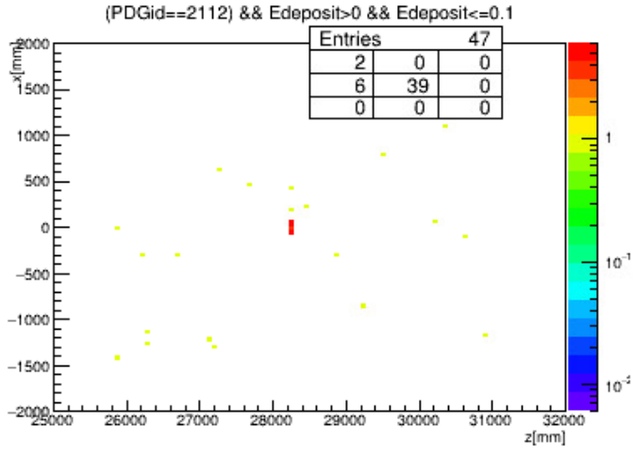


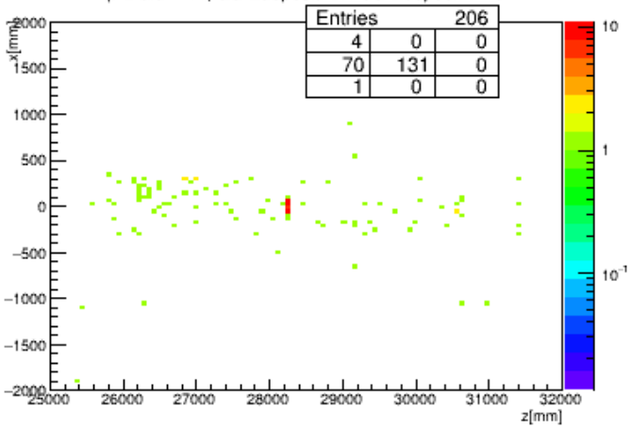


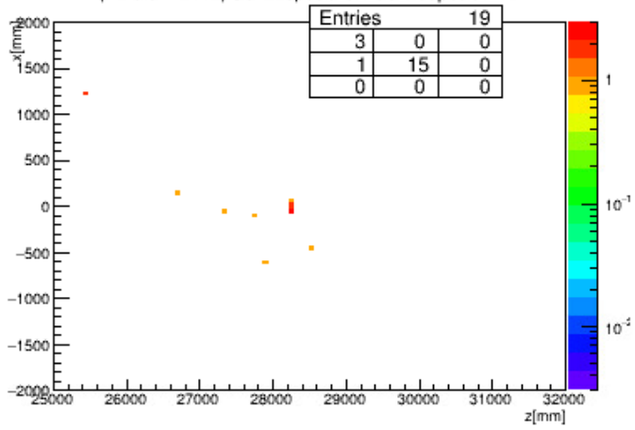
CREX - comparison

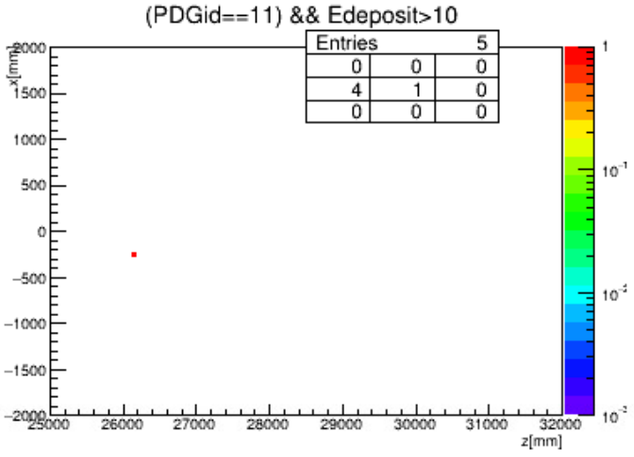
current setup

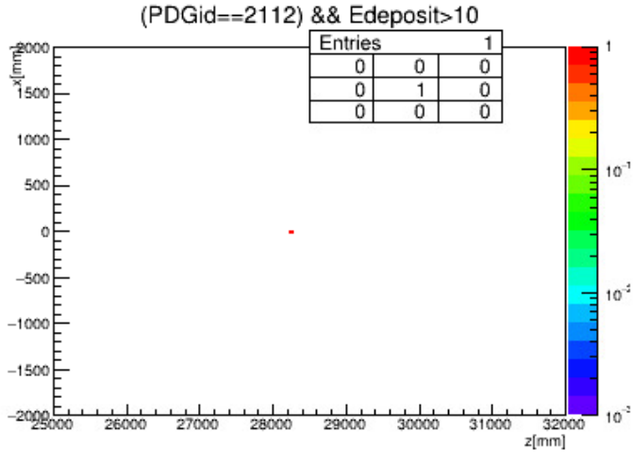




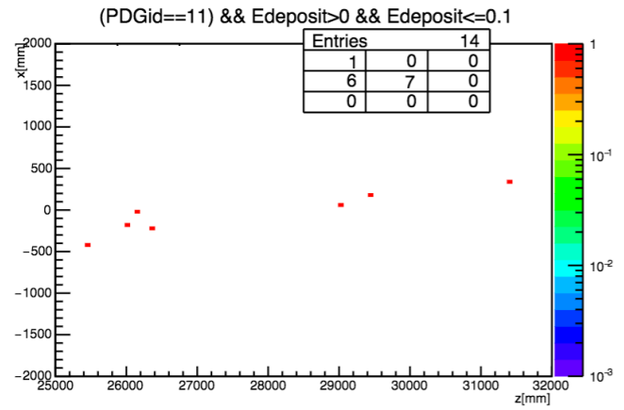


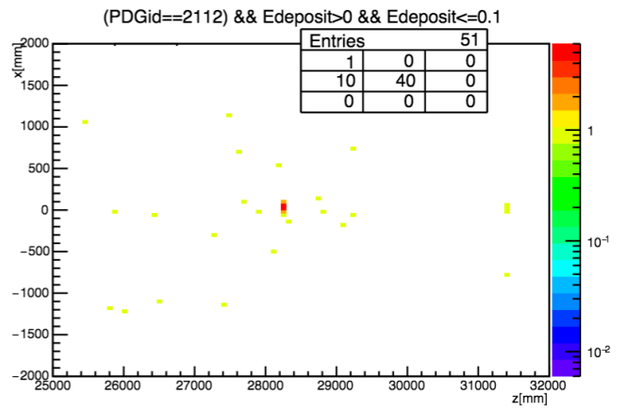


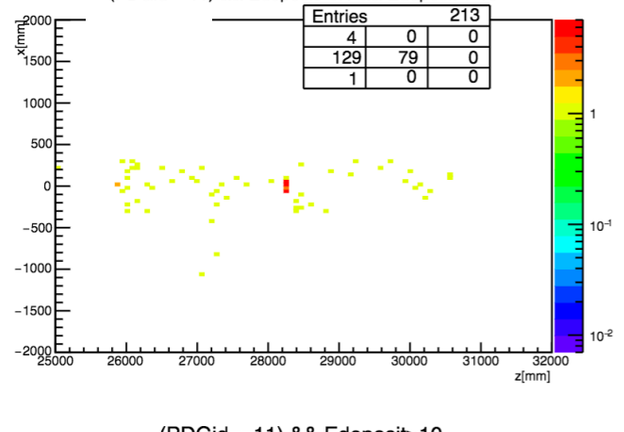


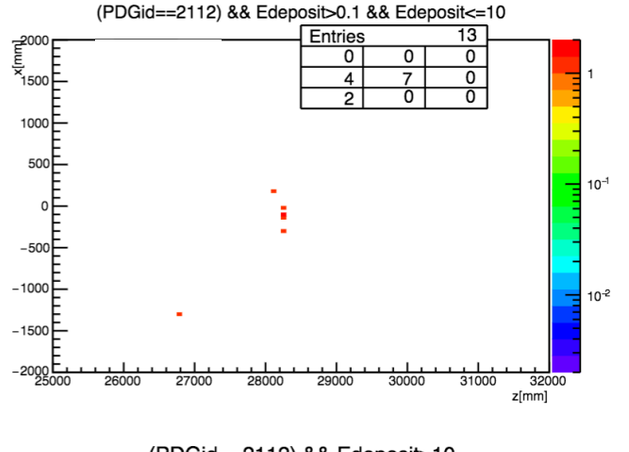


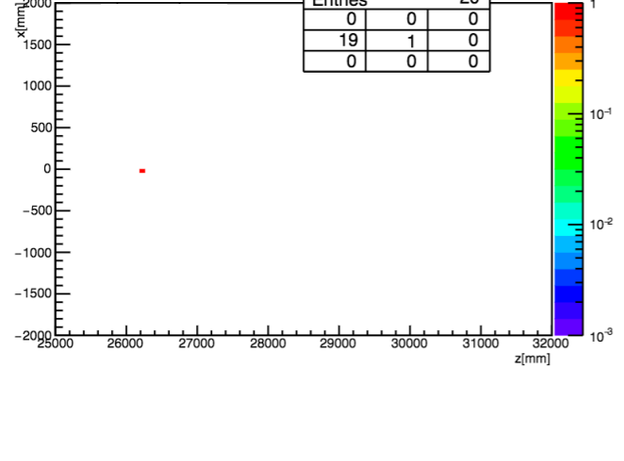
current setup + 0.5 ft concrete shield (2x stat)

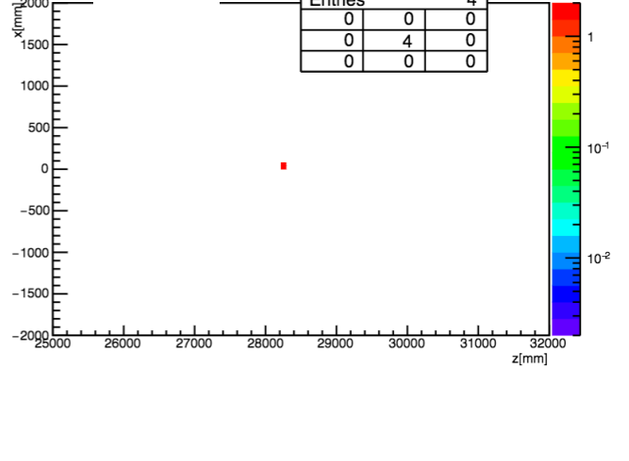






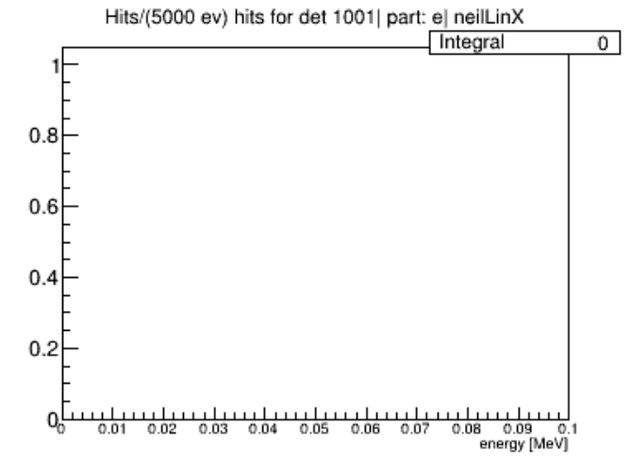


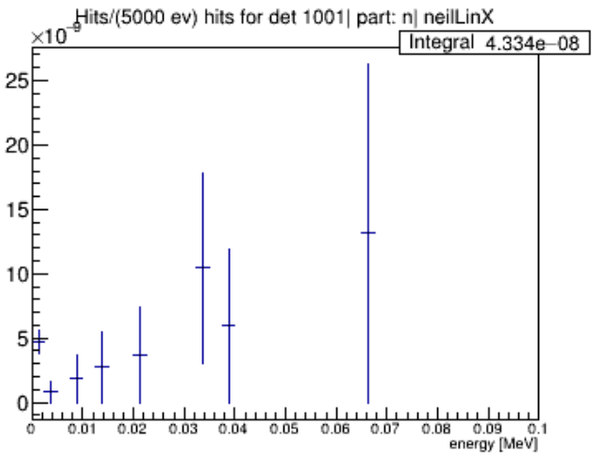


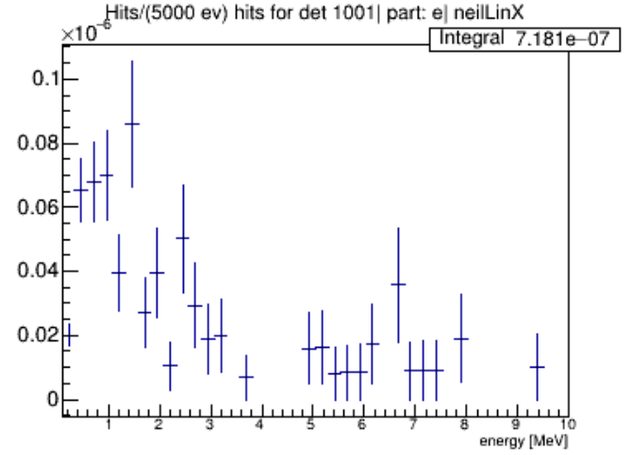


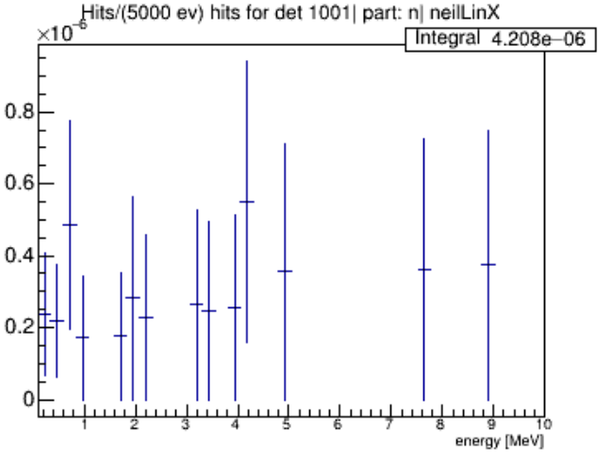
CREX - comparison

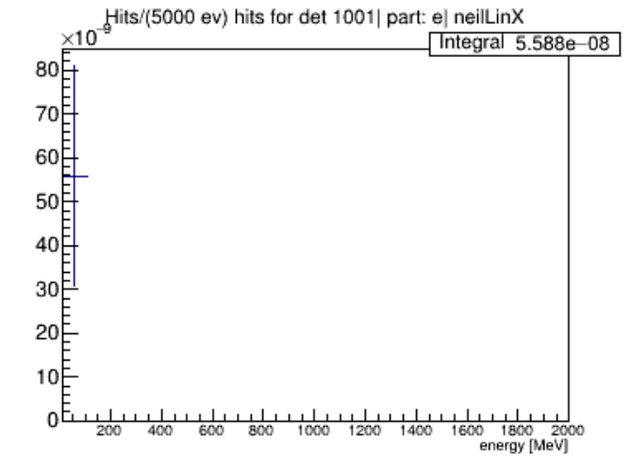
current setup

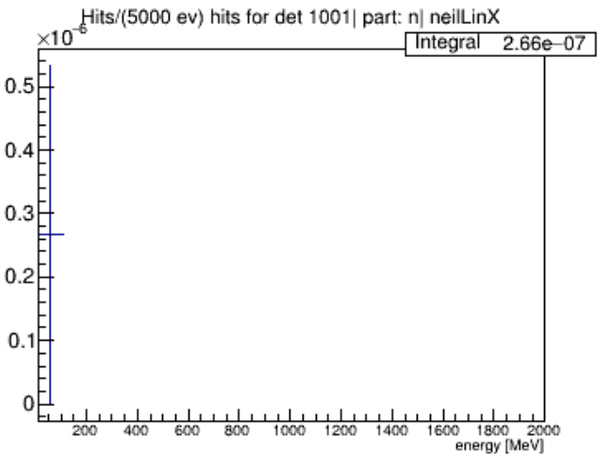




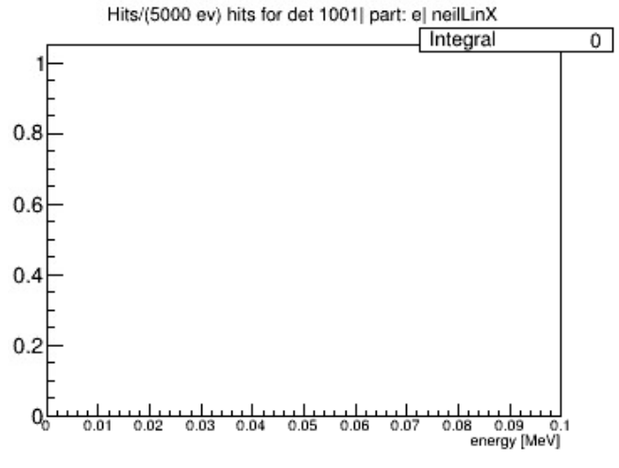


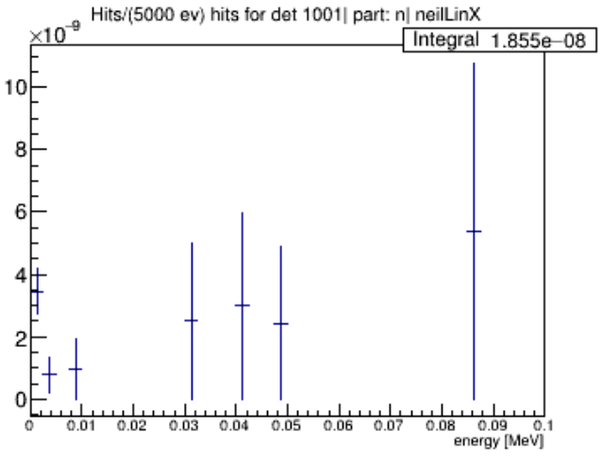


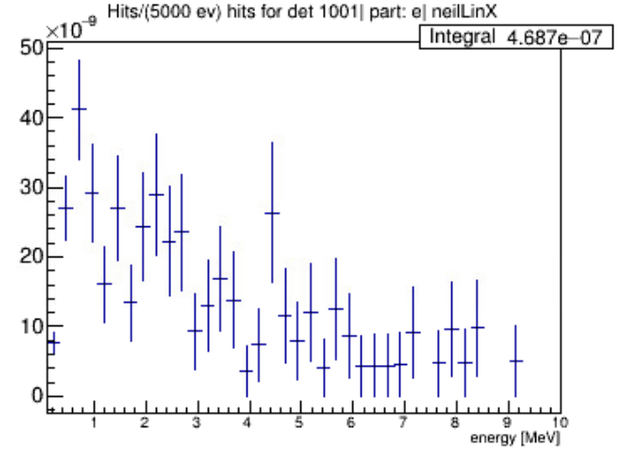


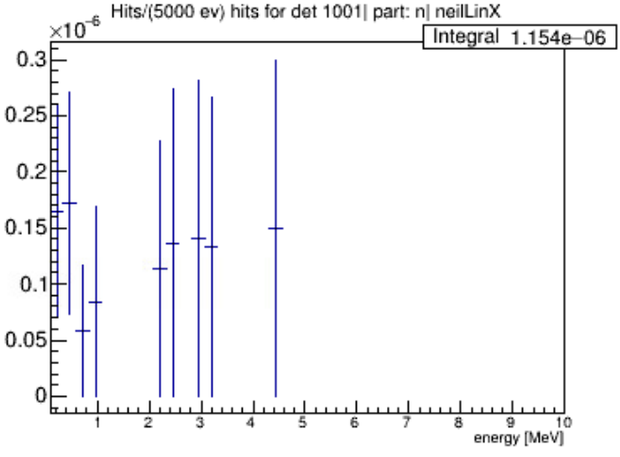


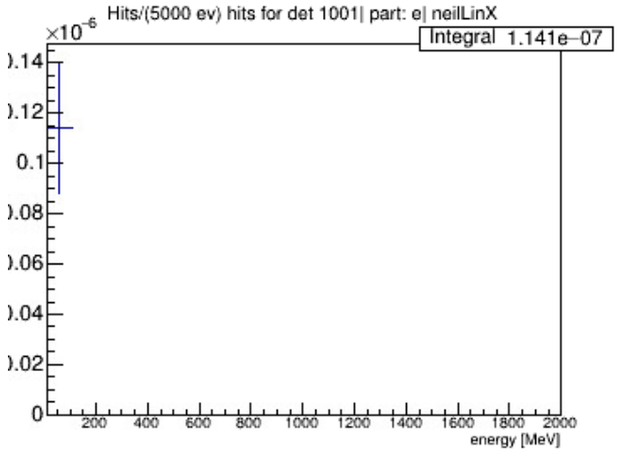
current setup + 0.5 ft concrete shield

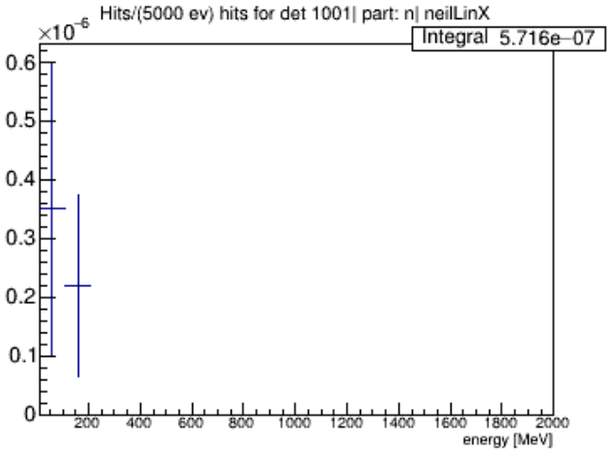






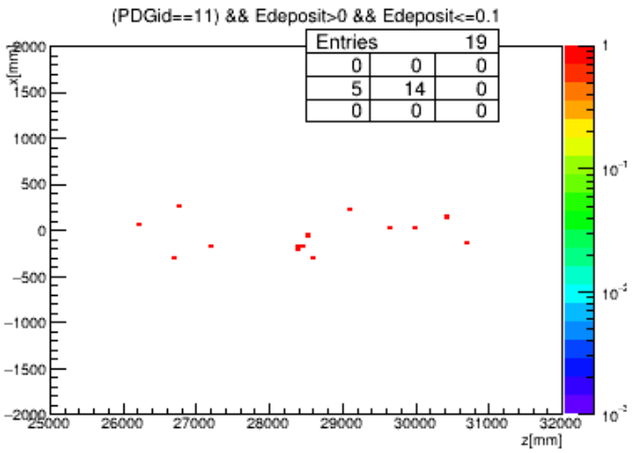


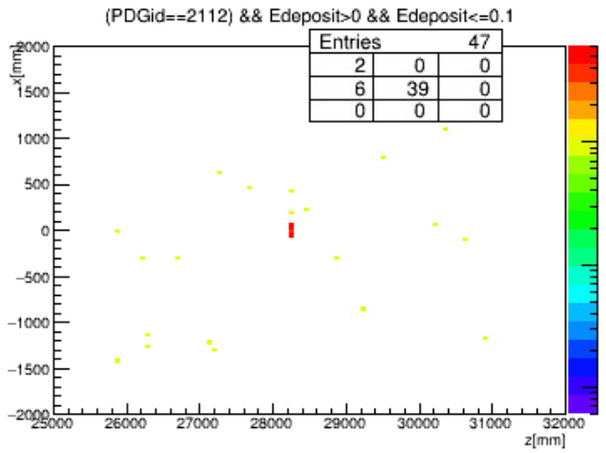


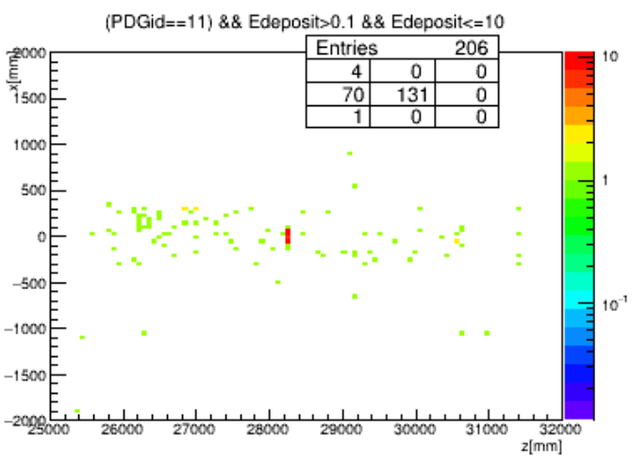


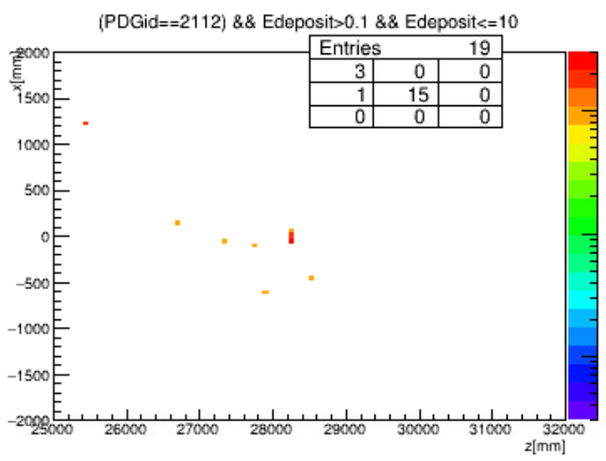
CREX - comparison

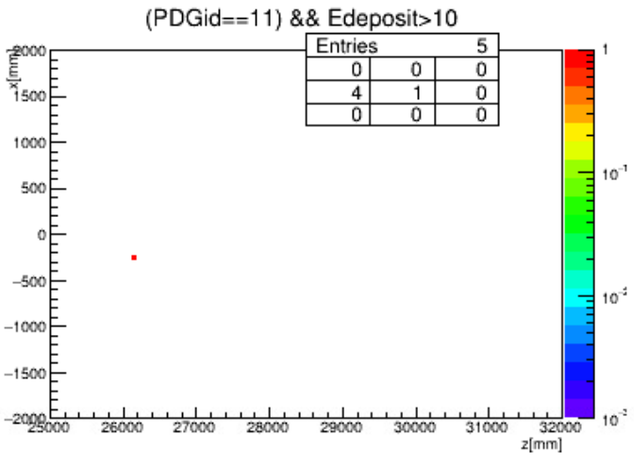
current setup

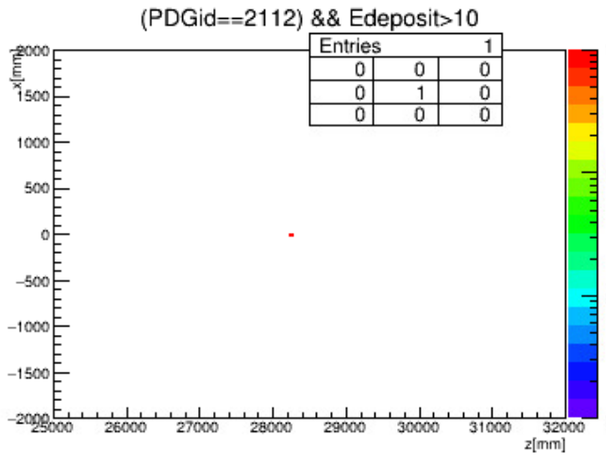




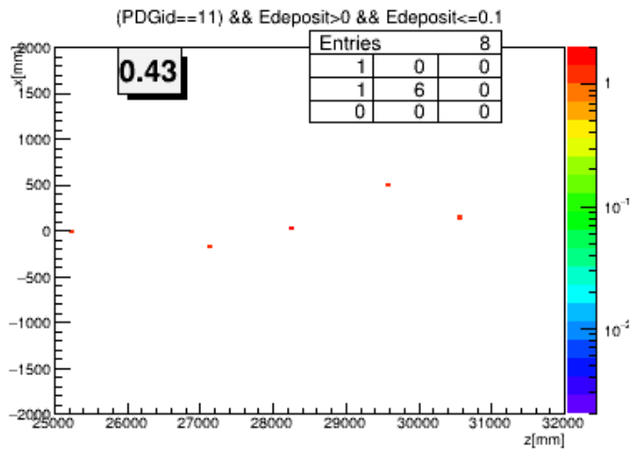


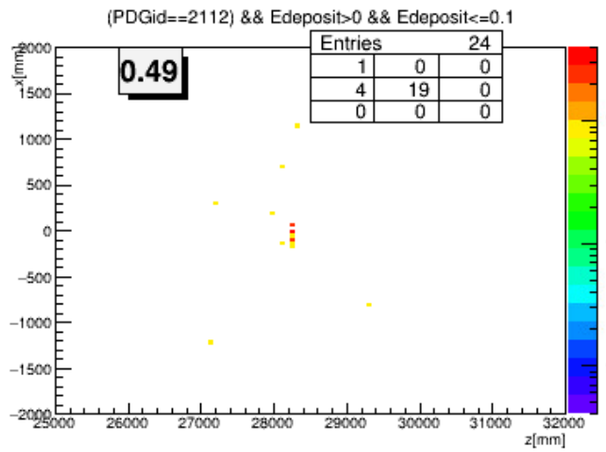


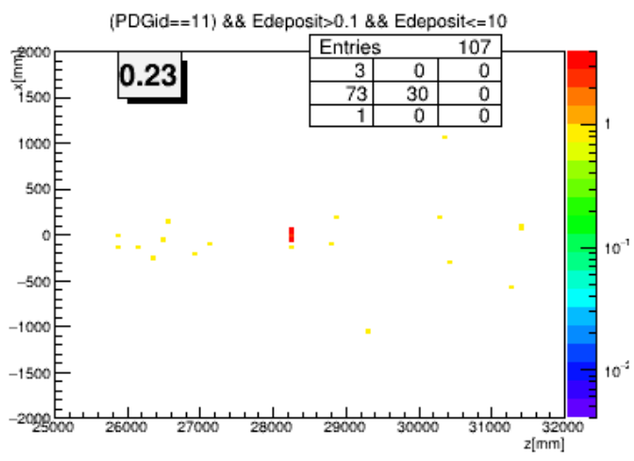


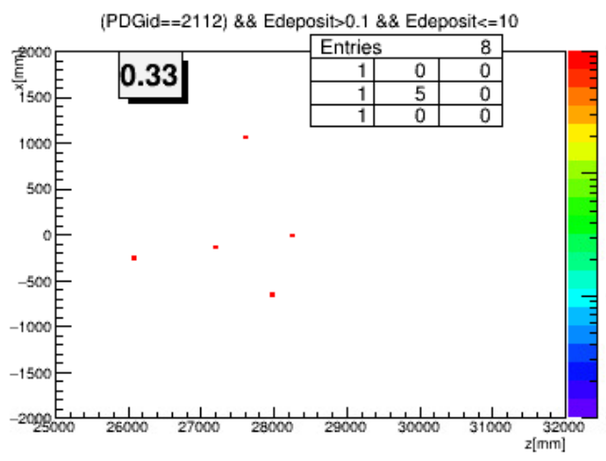


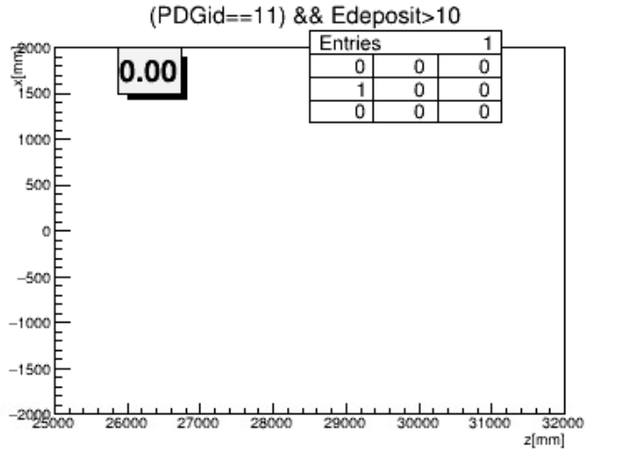
current setup + 1 ft Poly shield

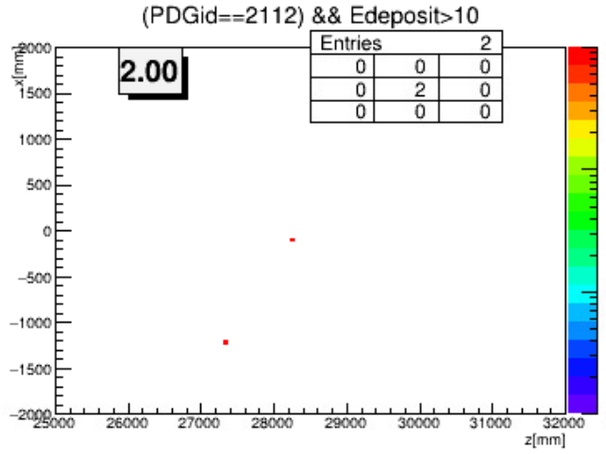






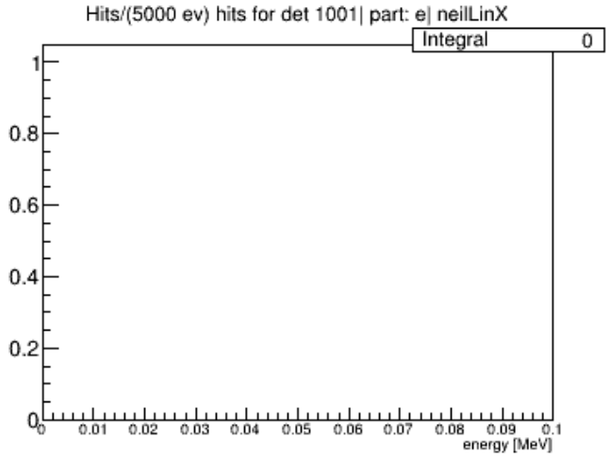


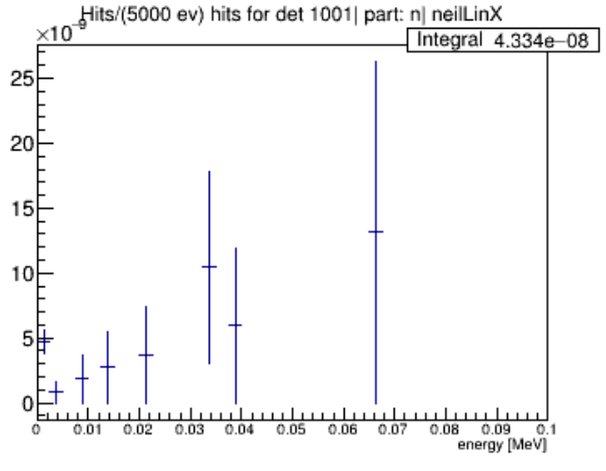


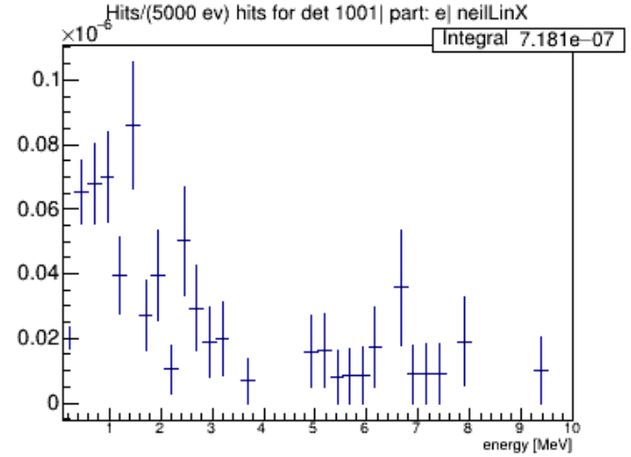


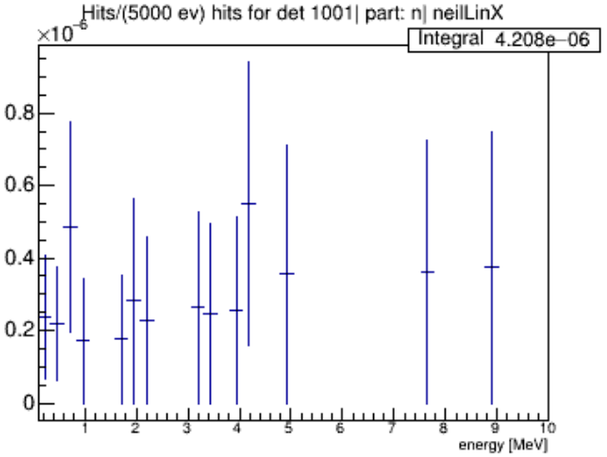
CREX - comparison

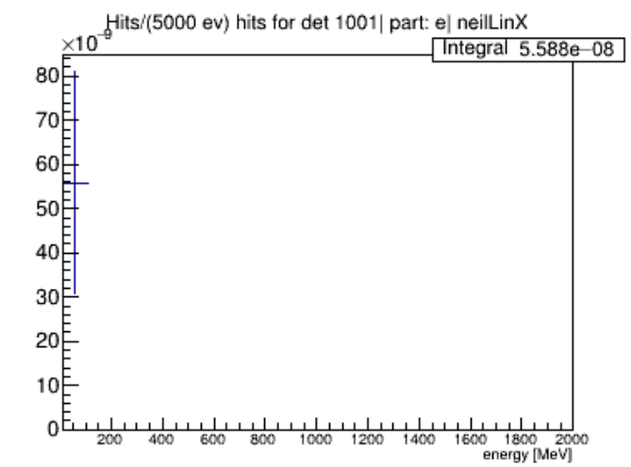
current setup

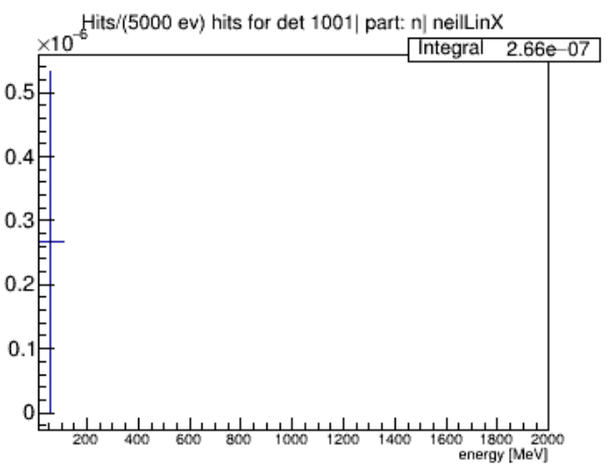




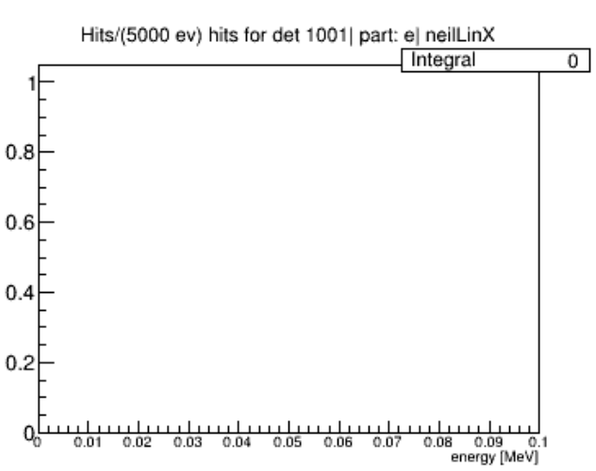


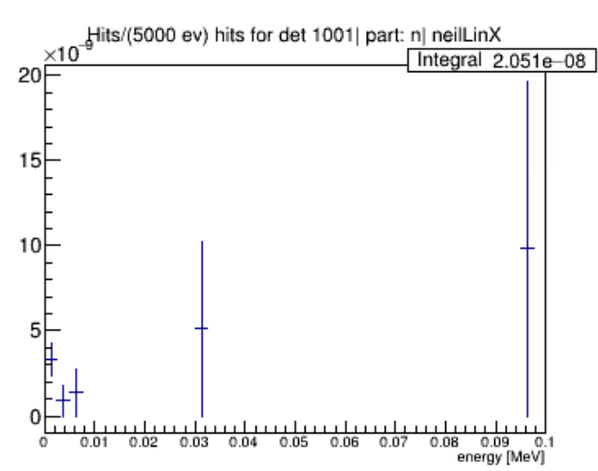


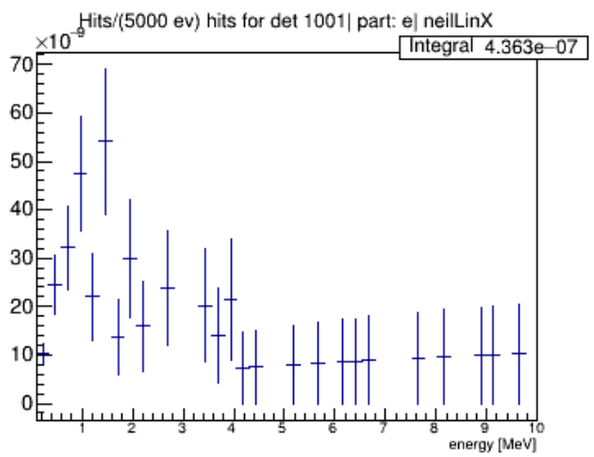


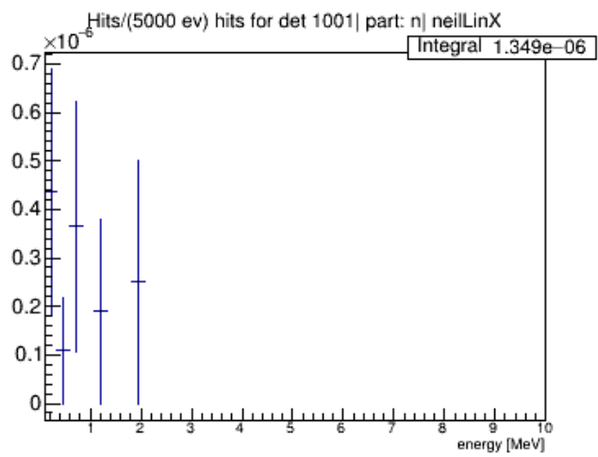


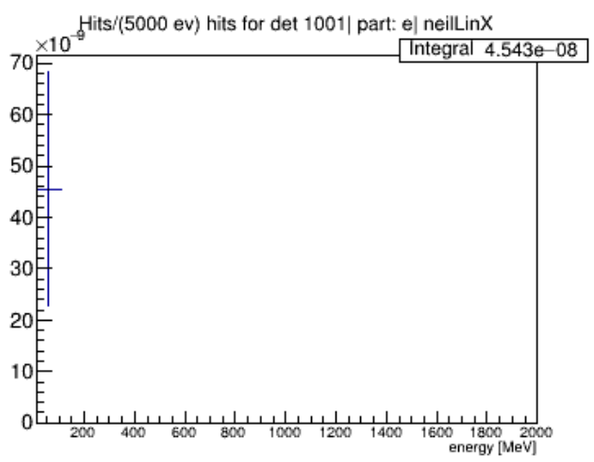
current setup + 1 ft Poly shield

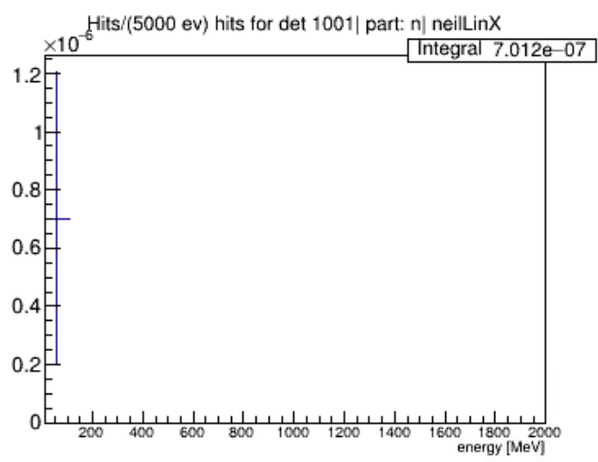






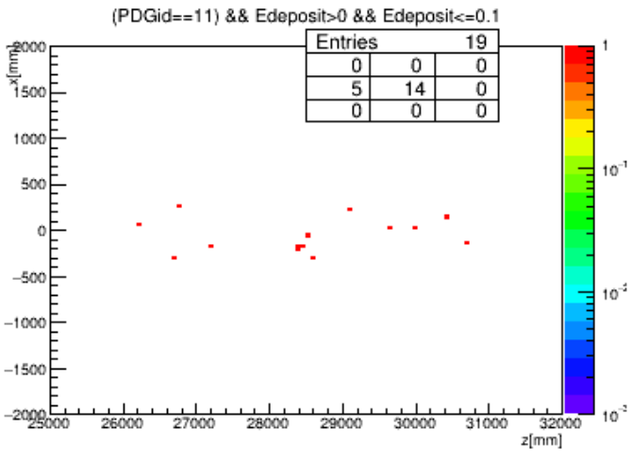


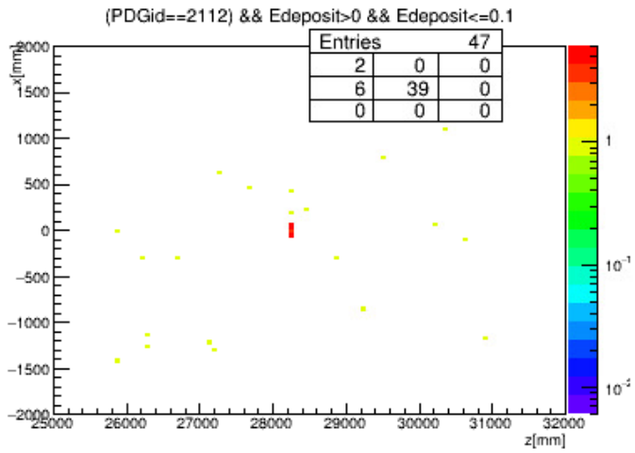


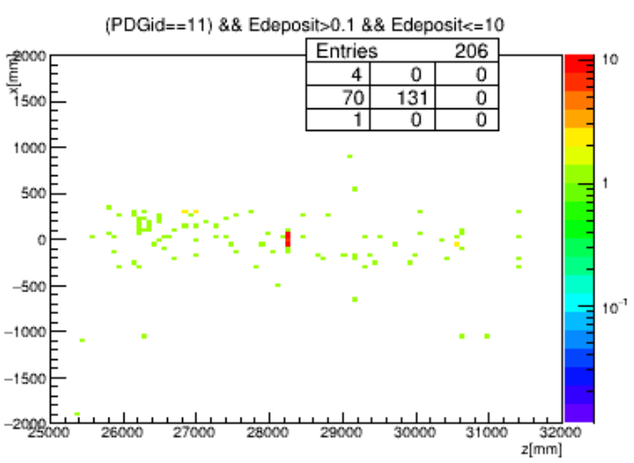


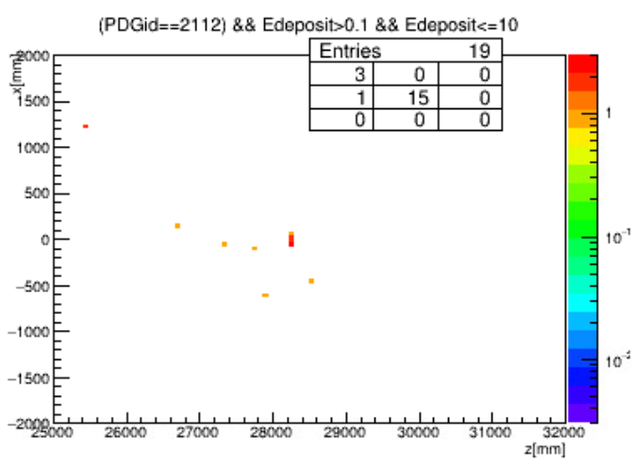
CREX - comparison

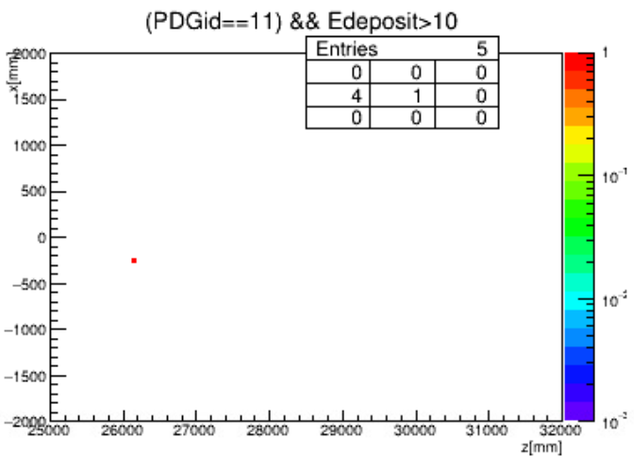
current setup

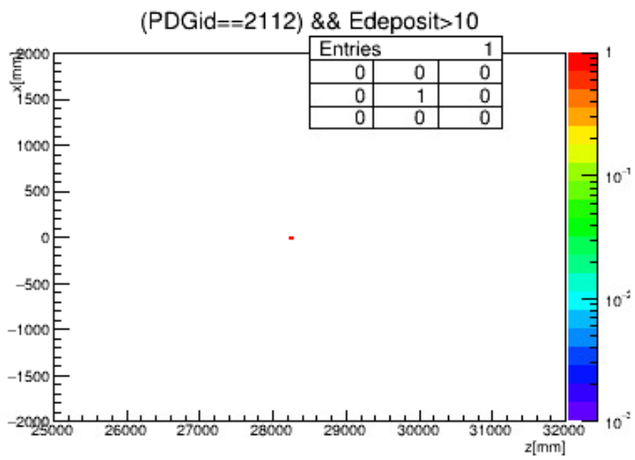




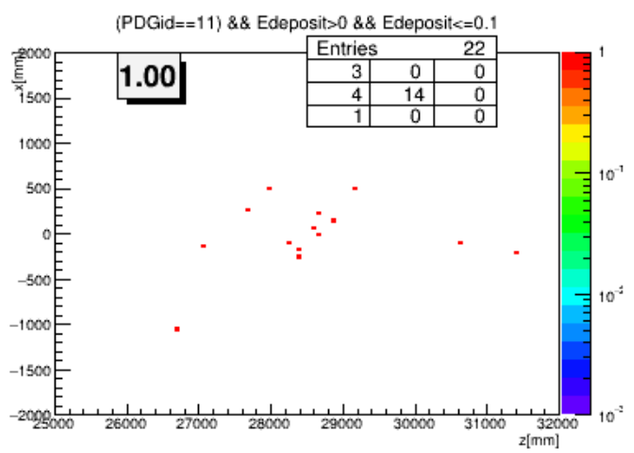


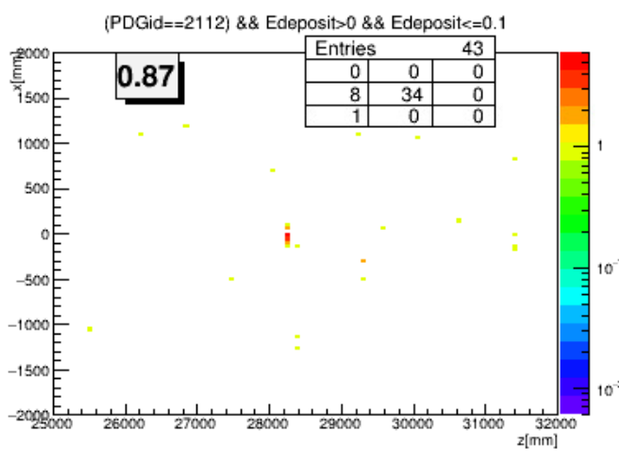


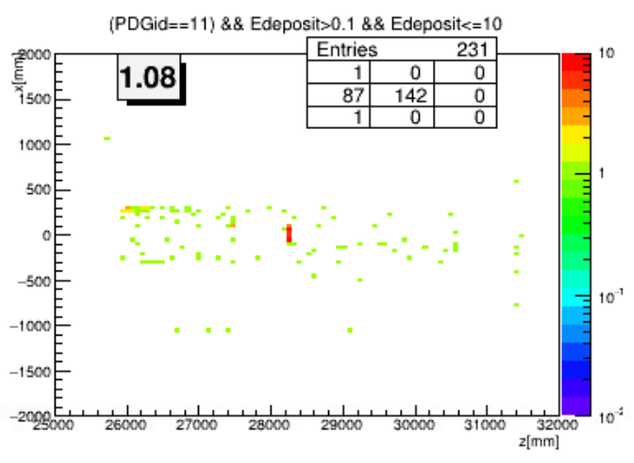


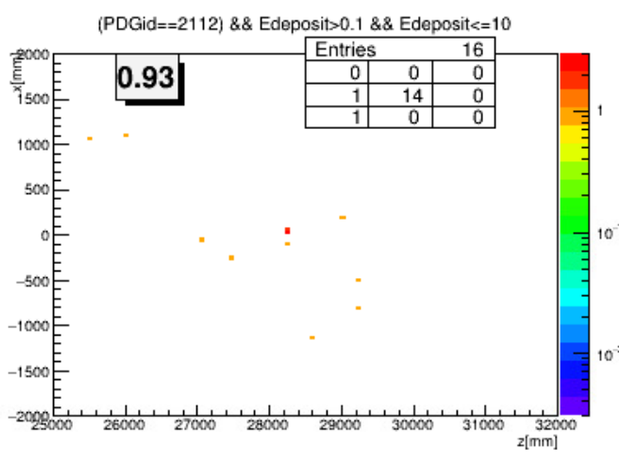


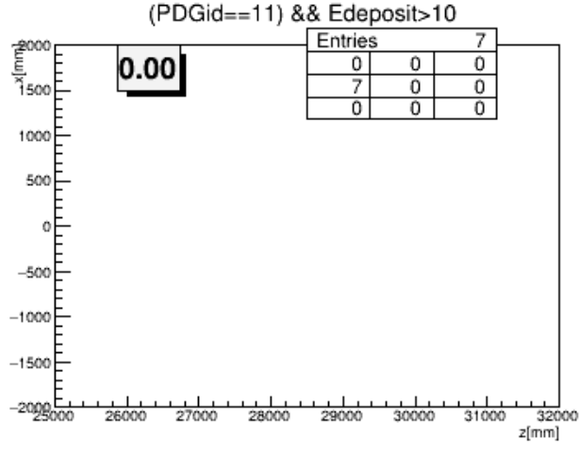
current setup + 2PipeSeptum

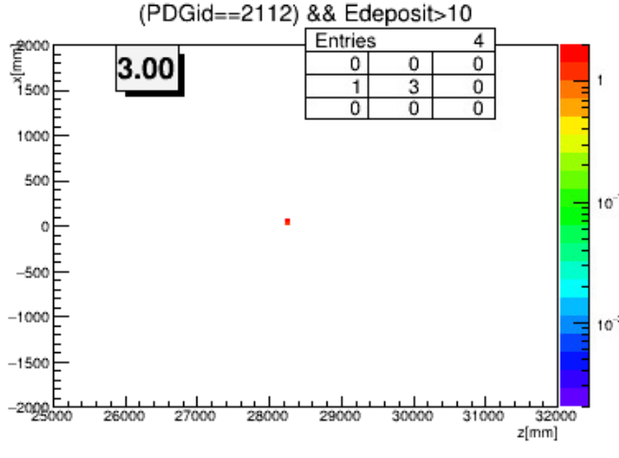






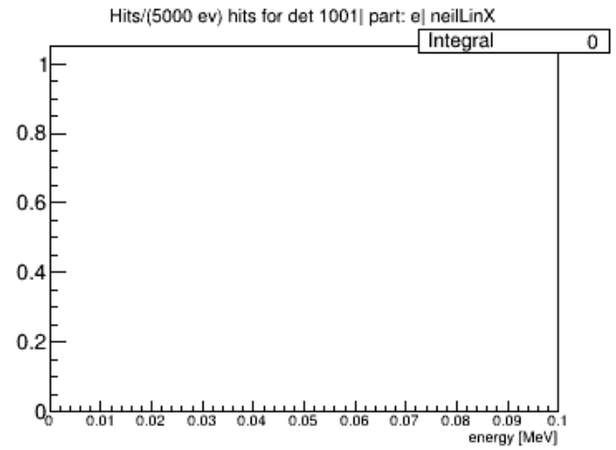


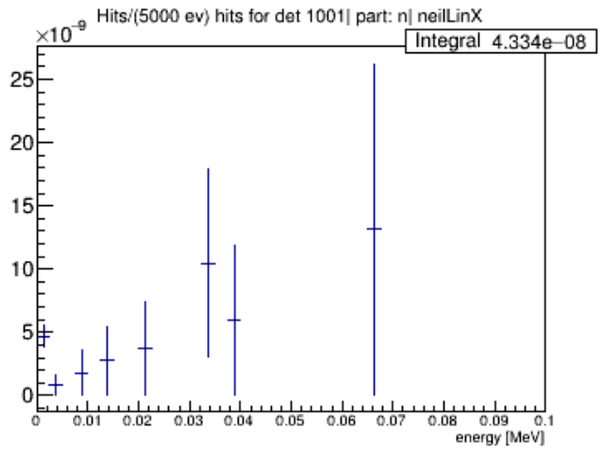


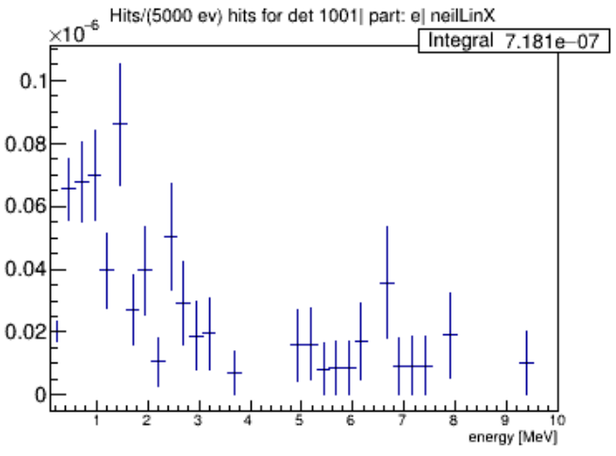


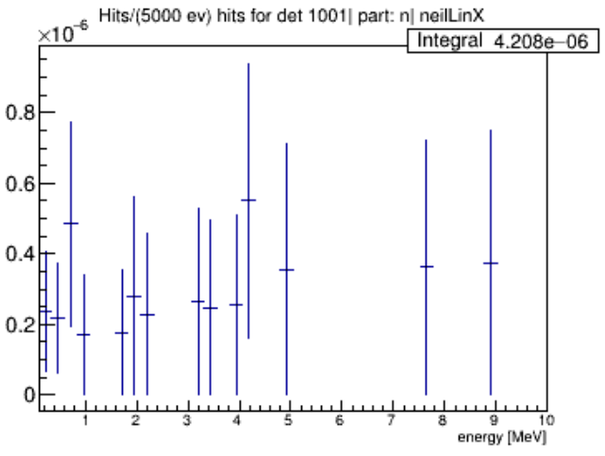
CREX - comparison

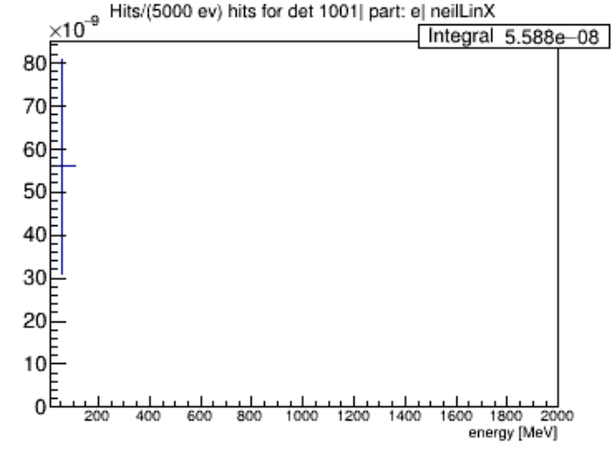
current setup

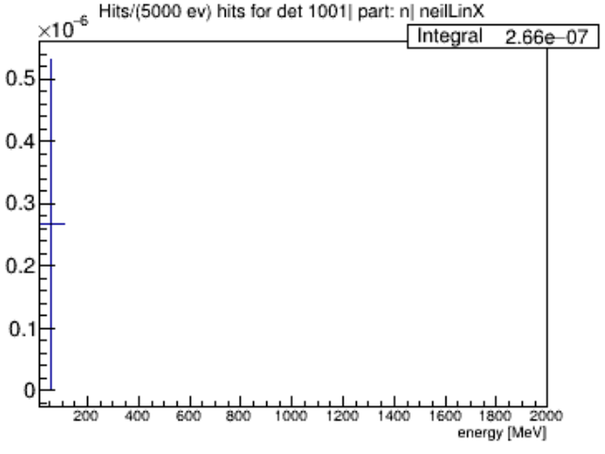




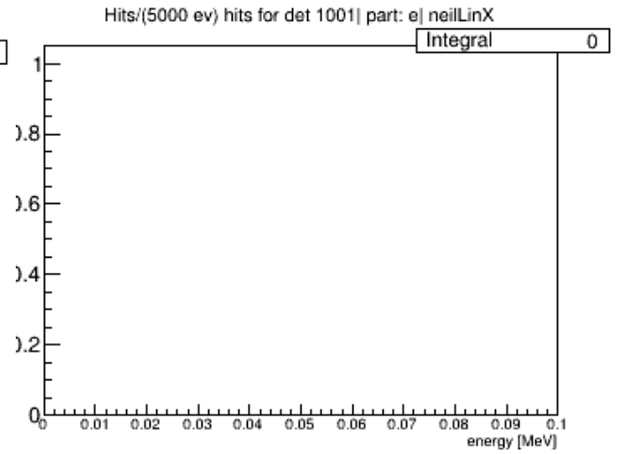


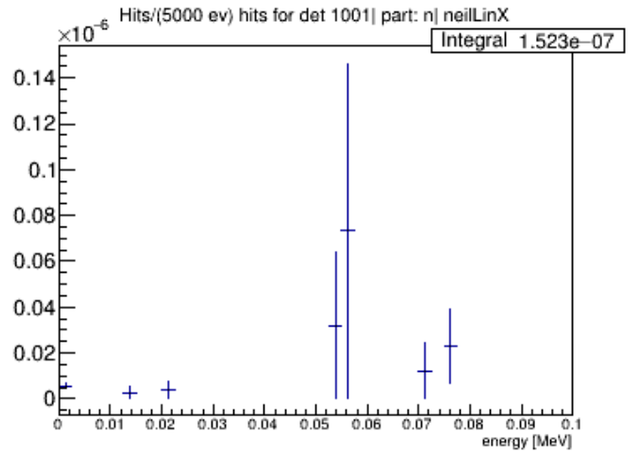


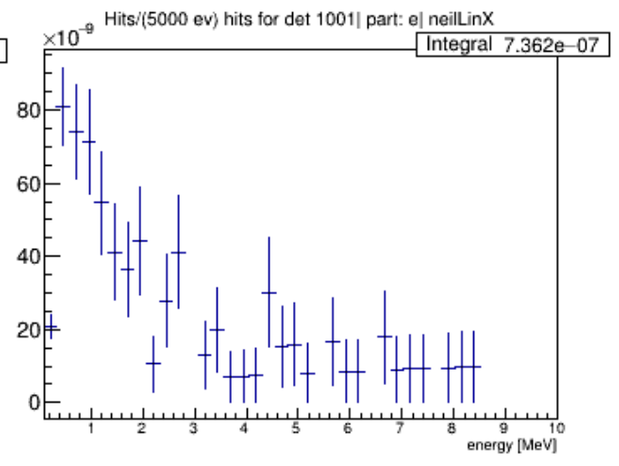


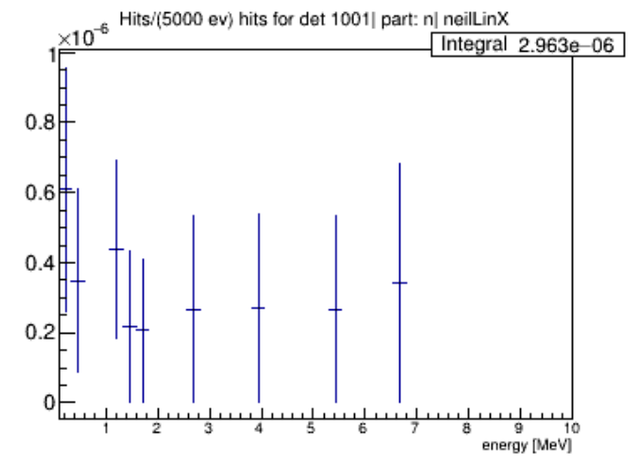


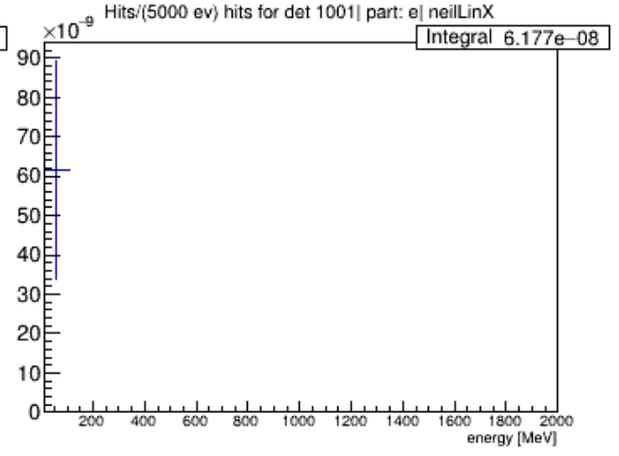
current setup + 2PipeSeptum

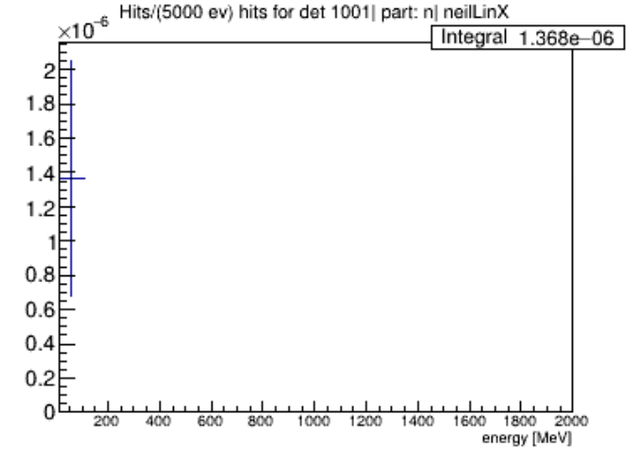






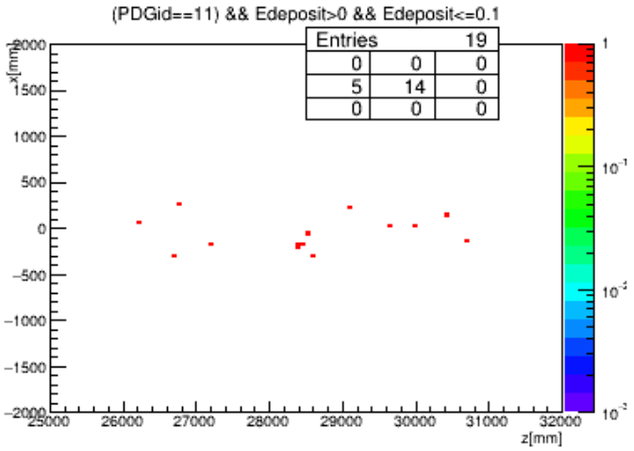


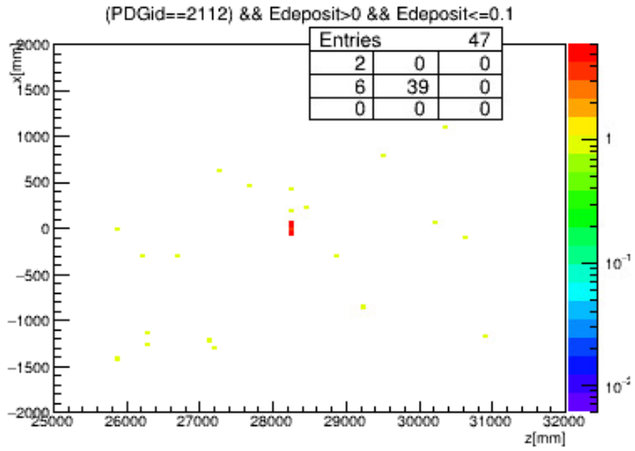


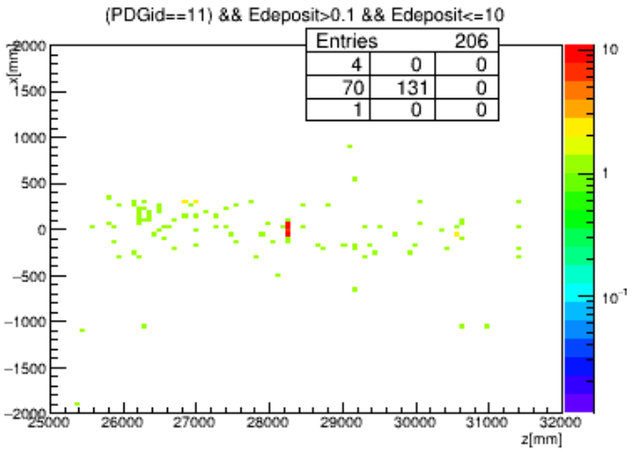


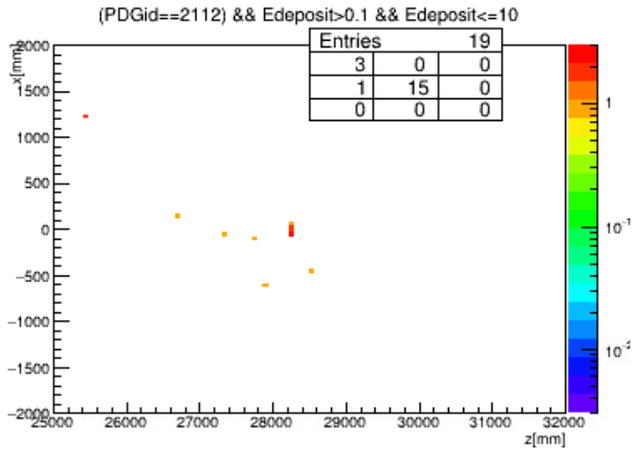
CREX - comparison

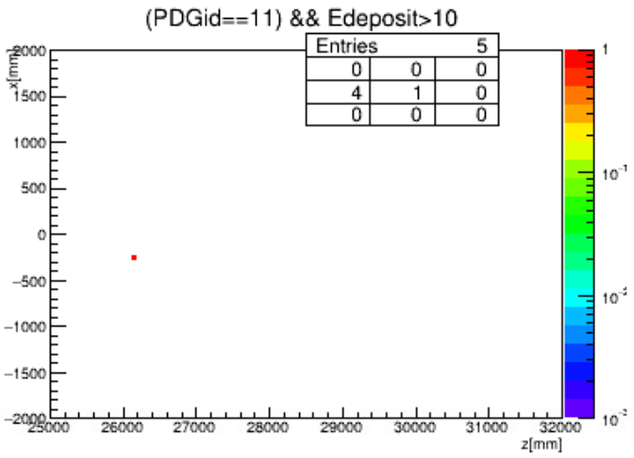
current setup

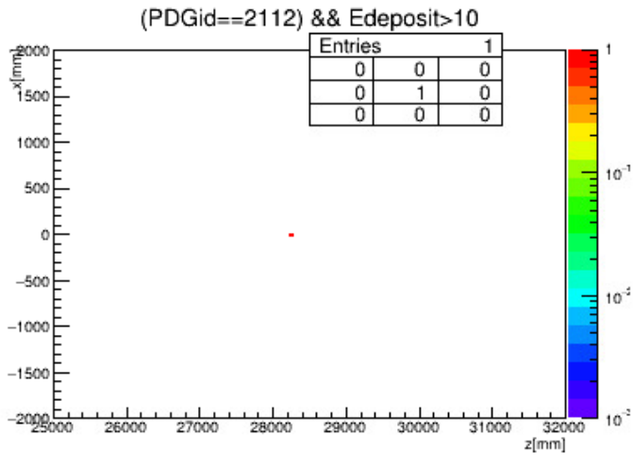




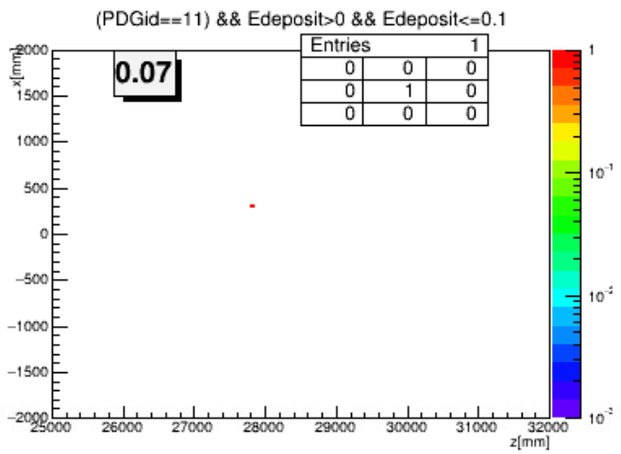


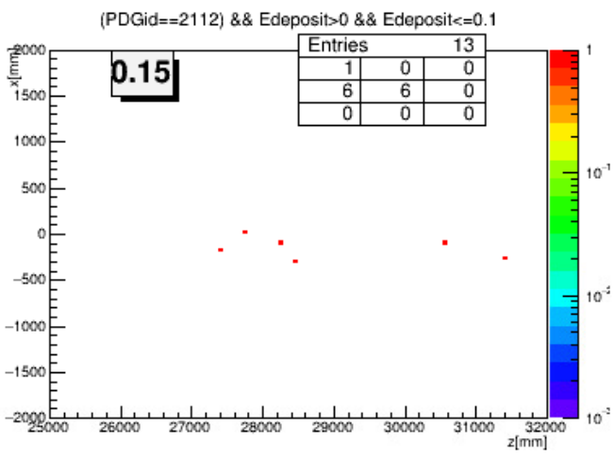


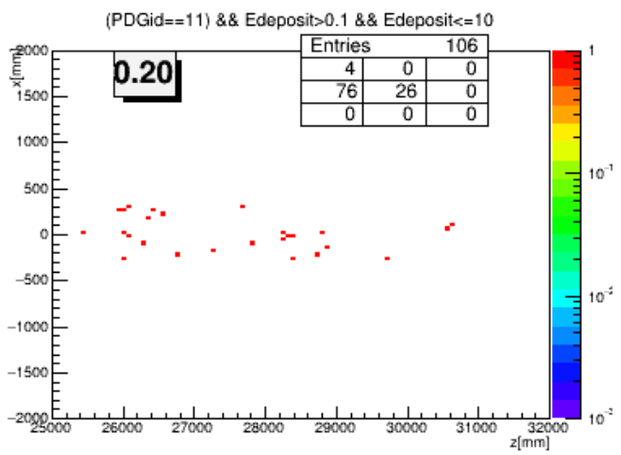


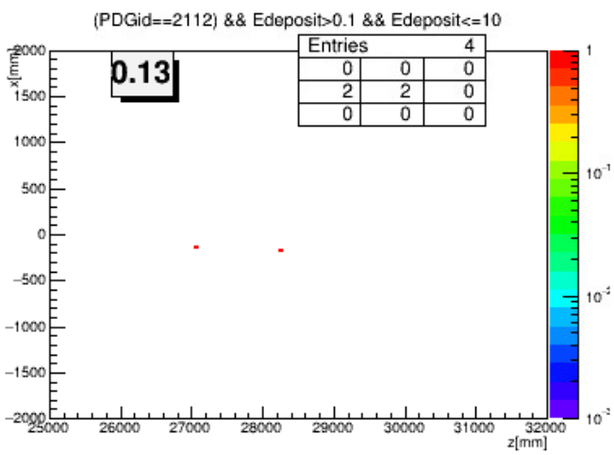


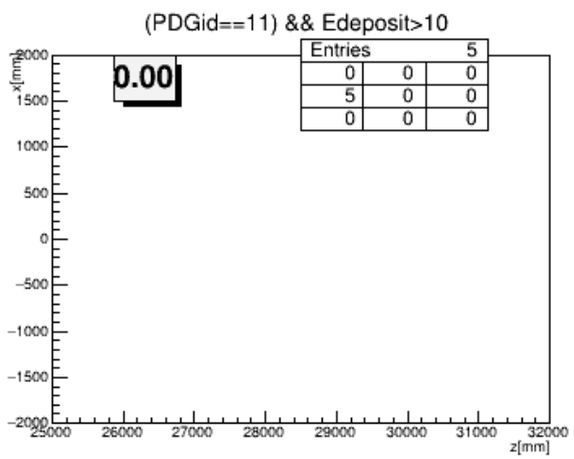
current setup + 4 in Donut+ 1 ft concrete shield

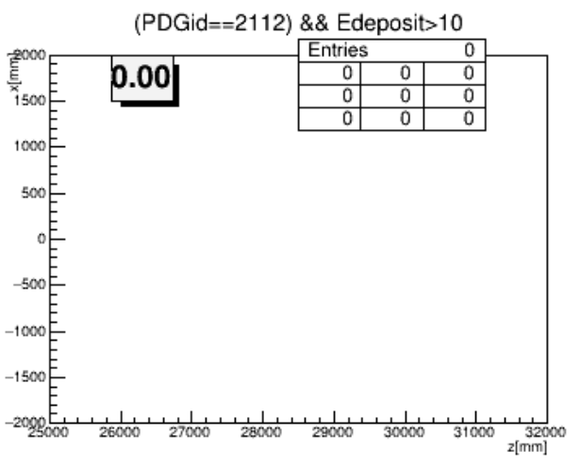






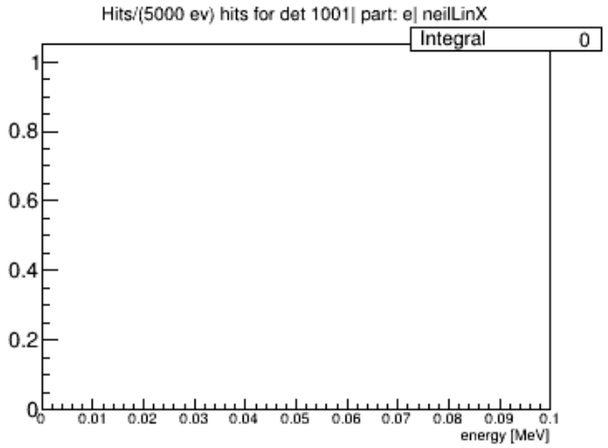


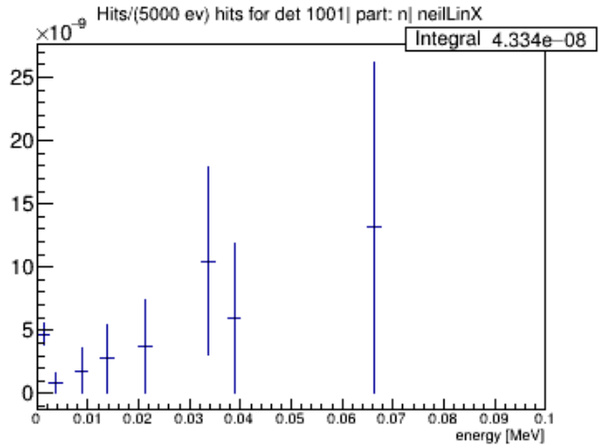


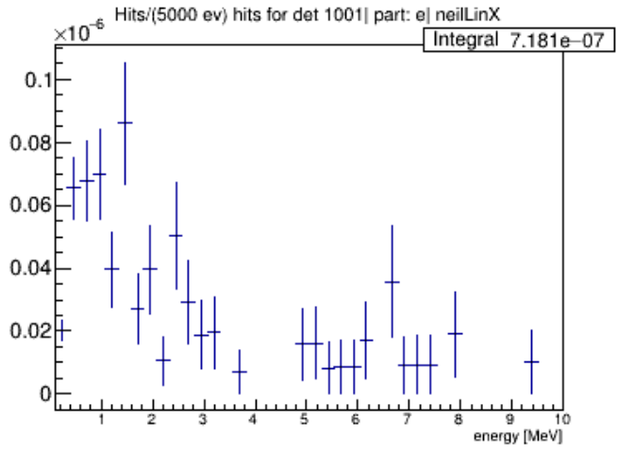


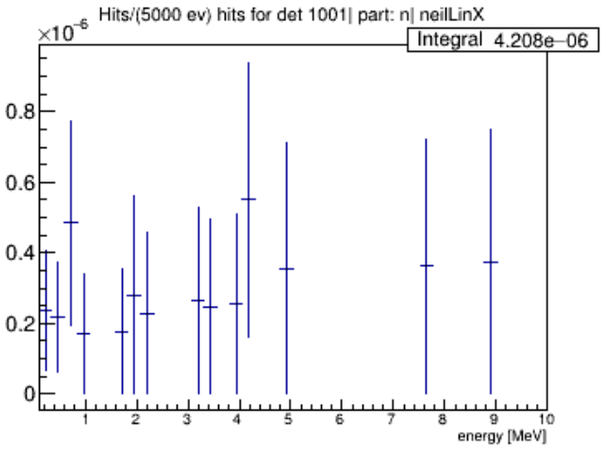
CREX - comparison

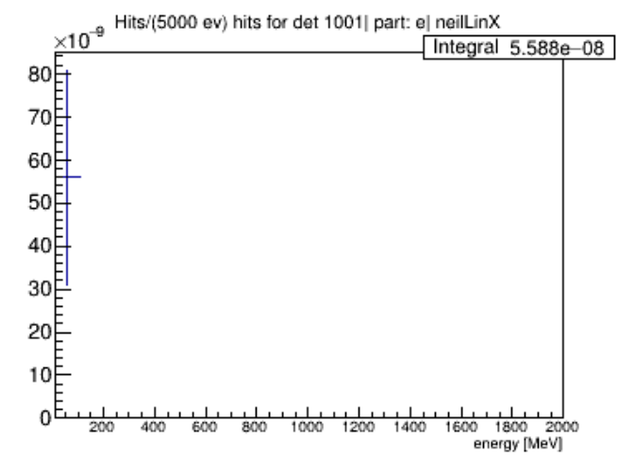
current setup

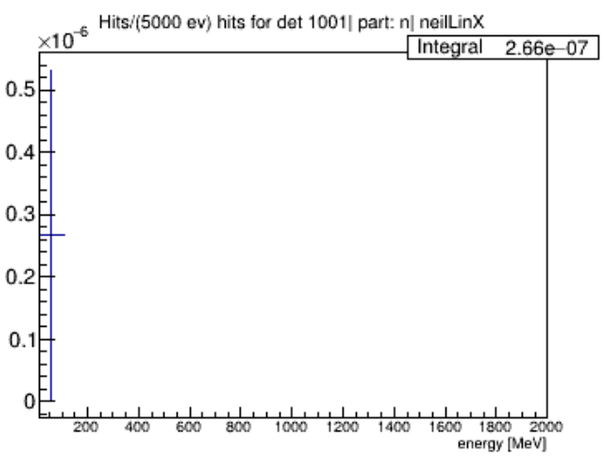




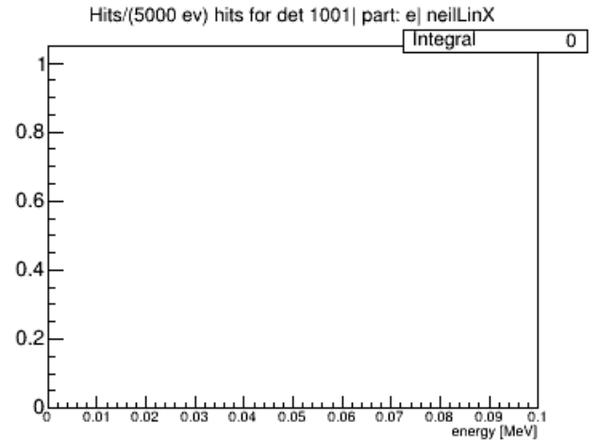


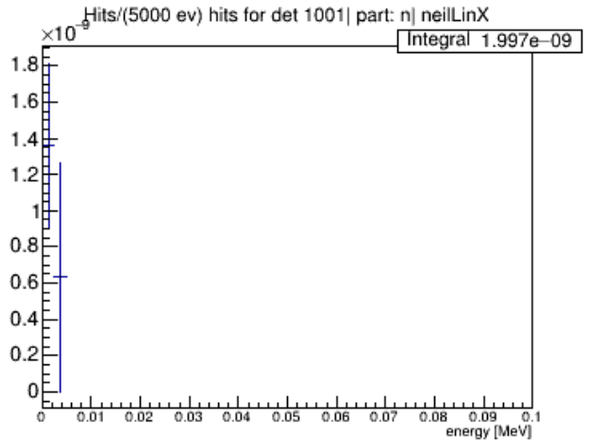


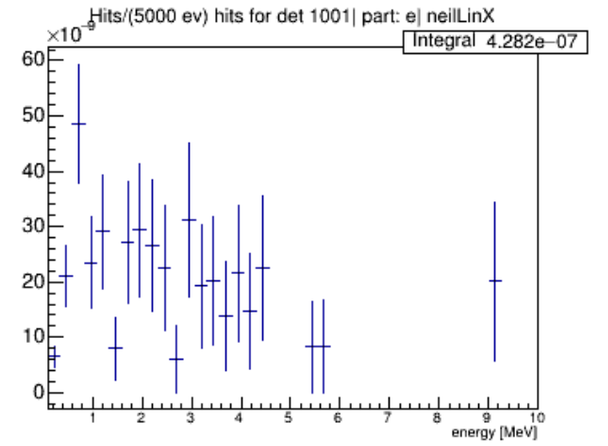


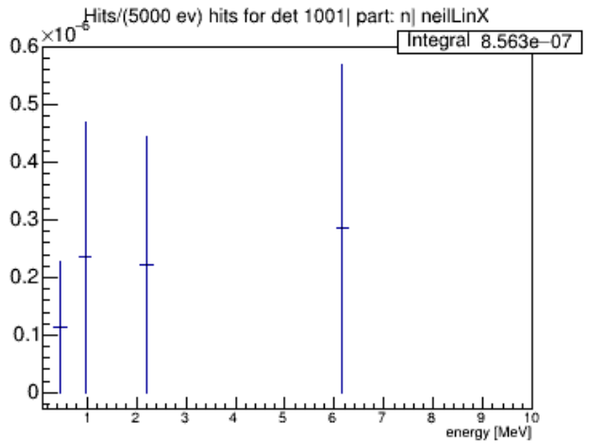


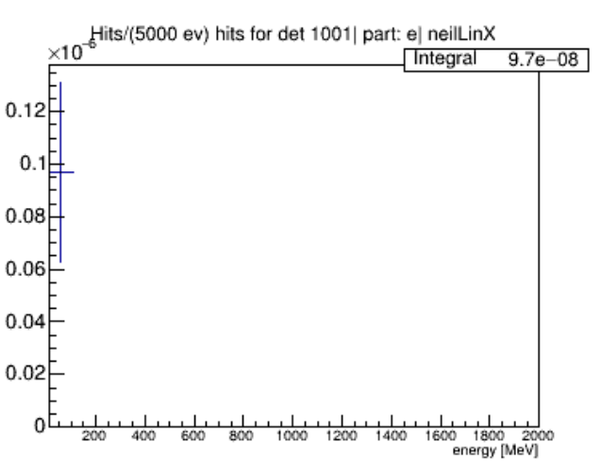
current setup + 4 in Donut+ 1 ft concrete shield

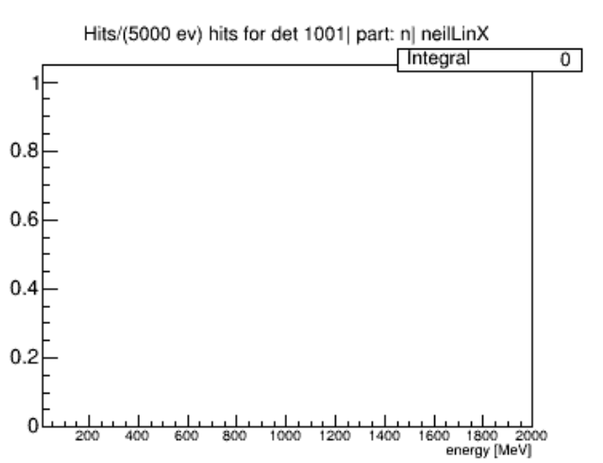






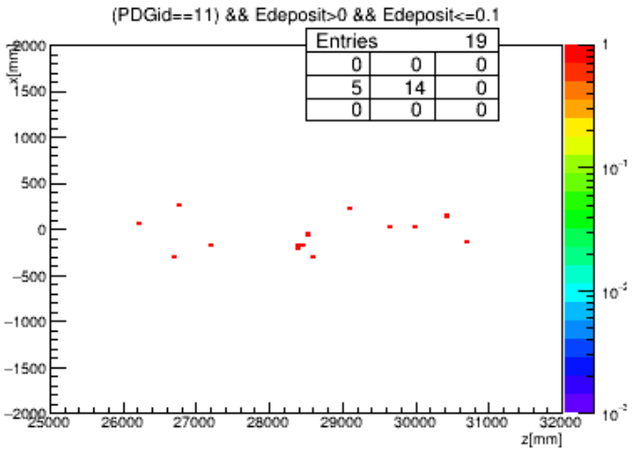


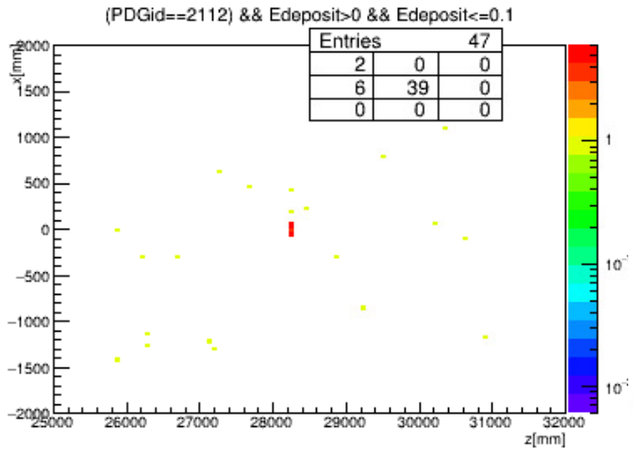


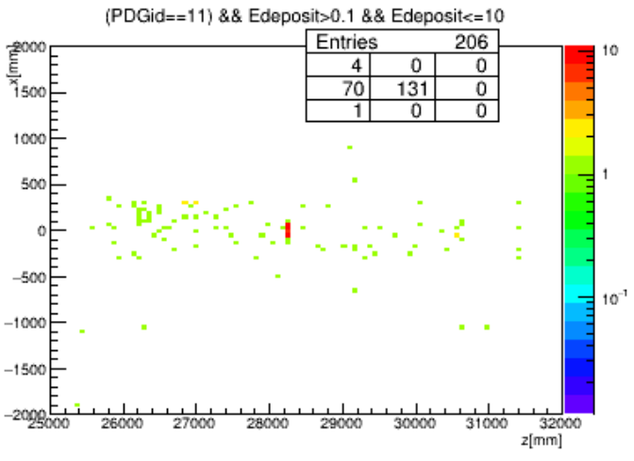


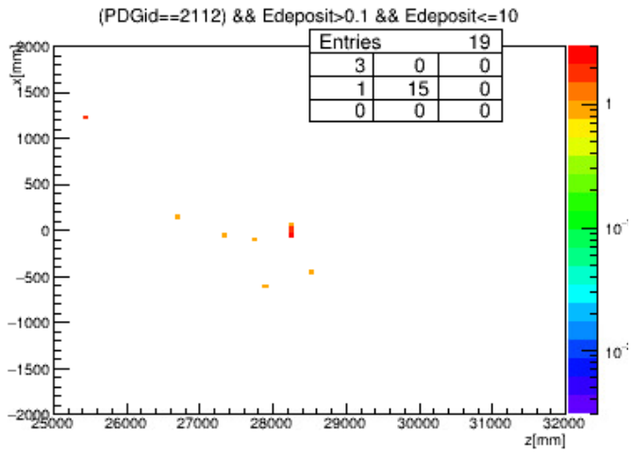
CREX - comparison

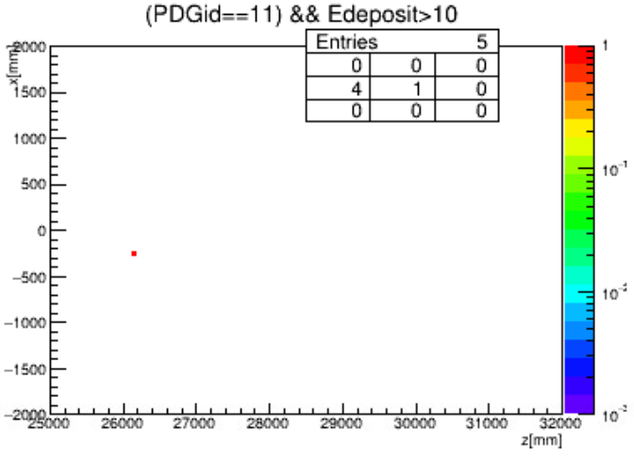
current setup

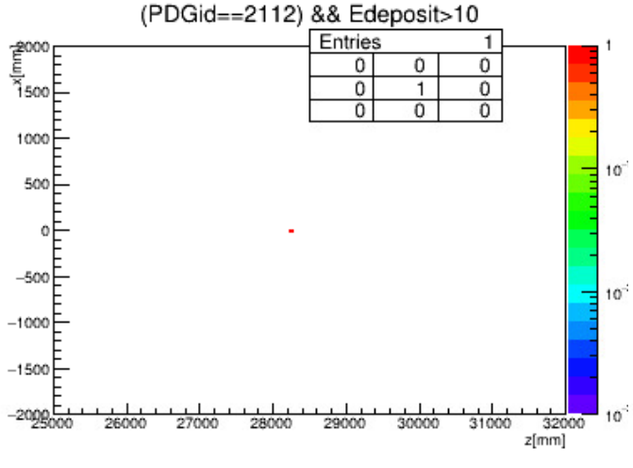




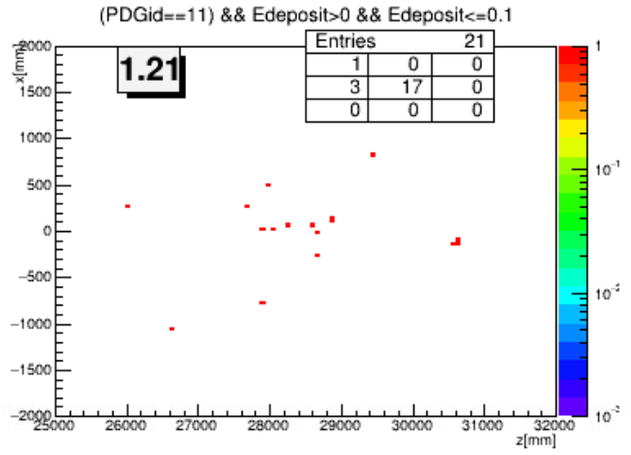


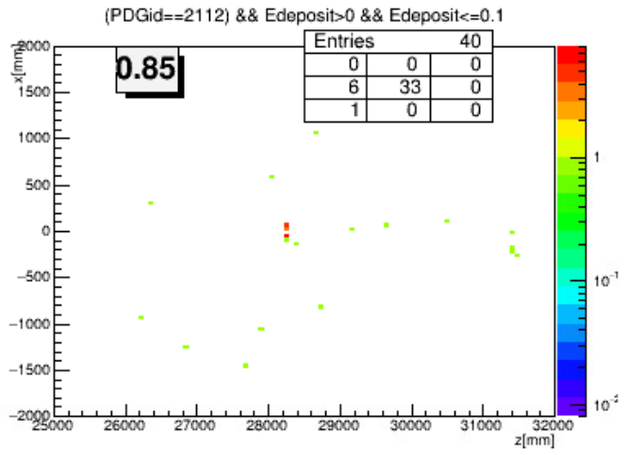


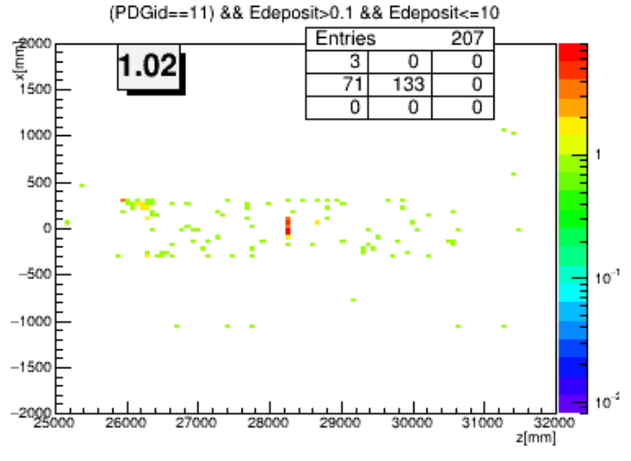


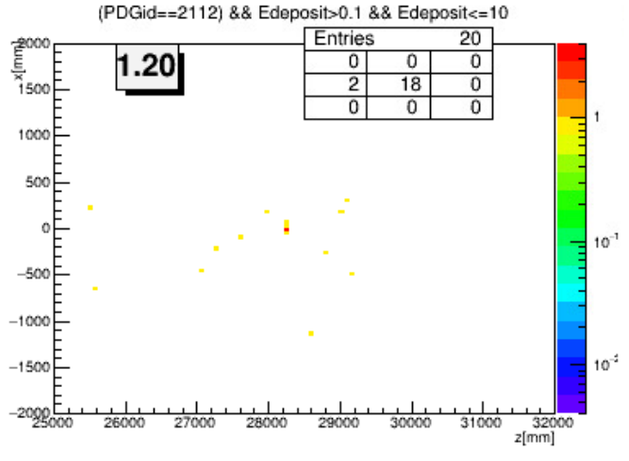


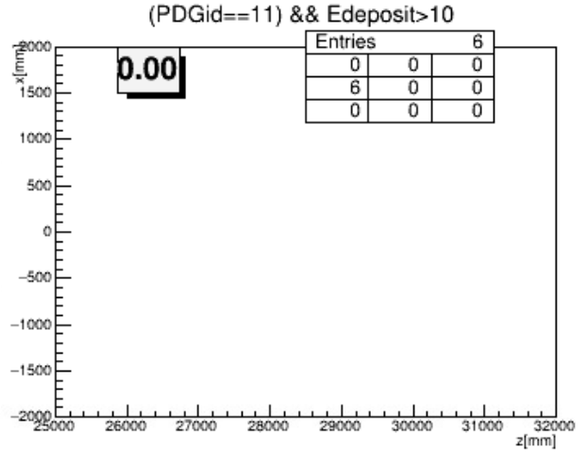
current setup + 2PipeSeptum+donut shield

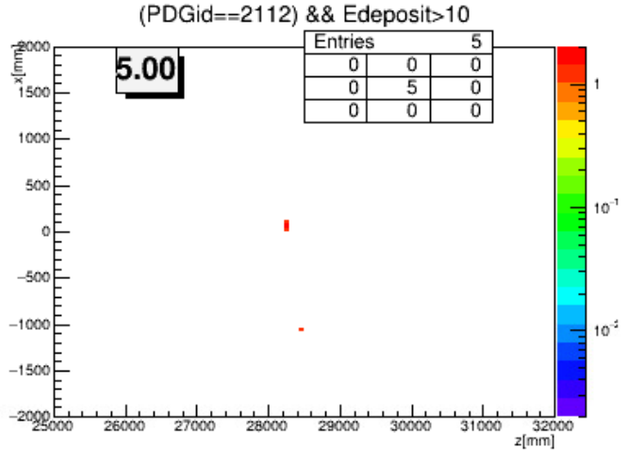






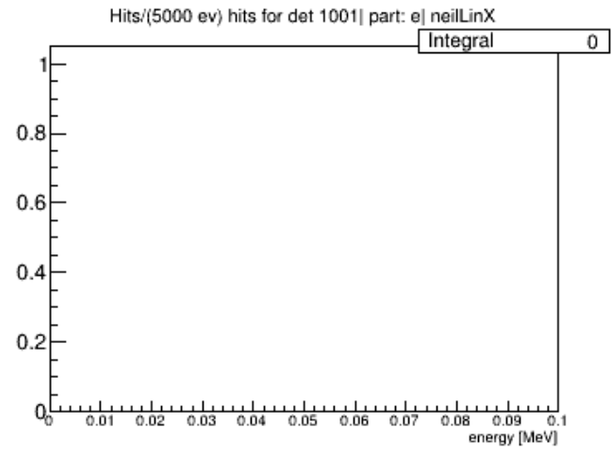


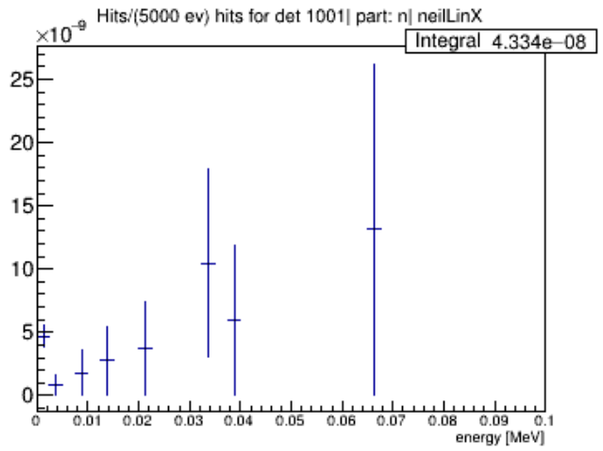


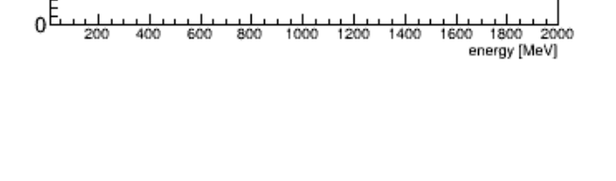


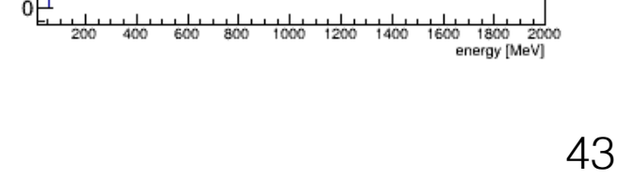
CREX - comparison

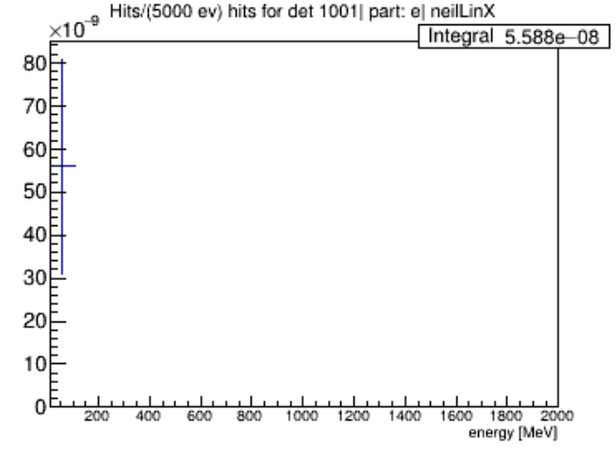
current setup

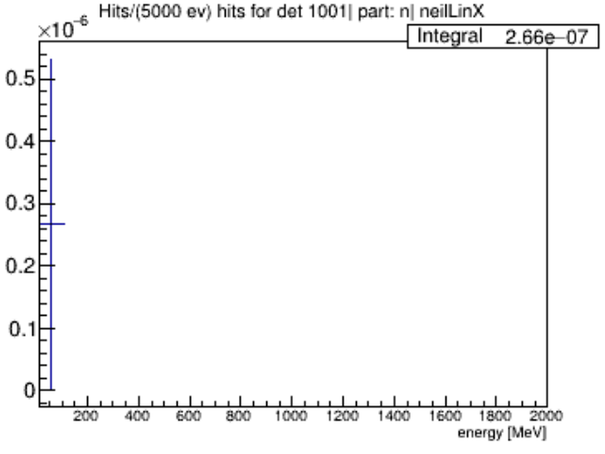




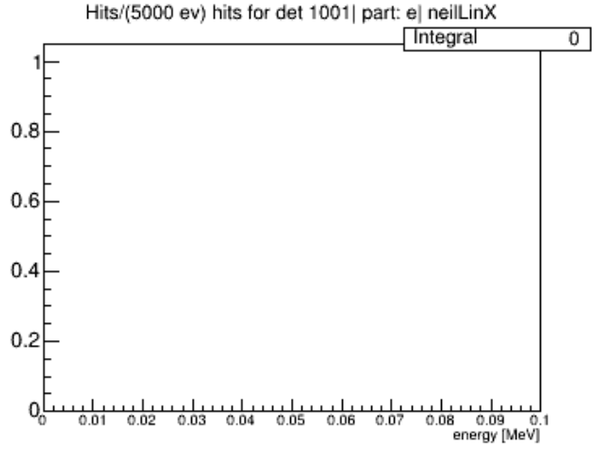


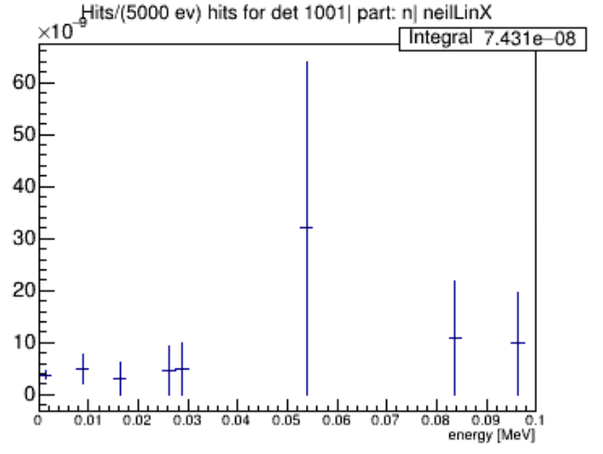


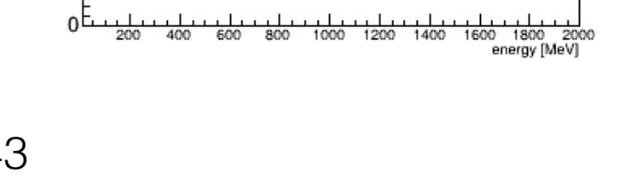


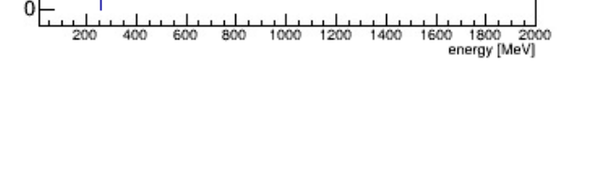


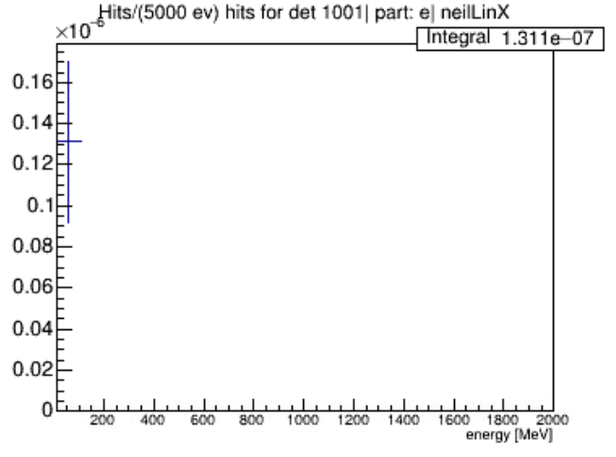
current setup + 2PipeSeptum+donut shield

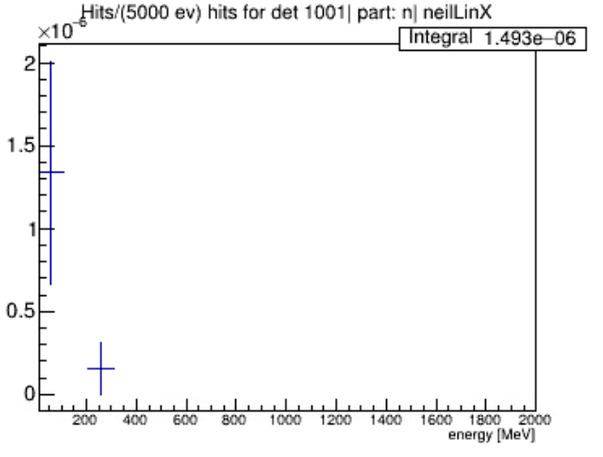




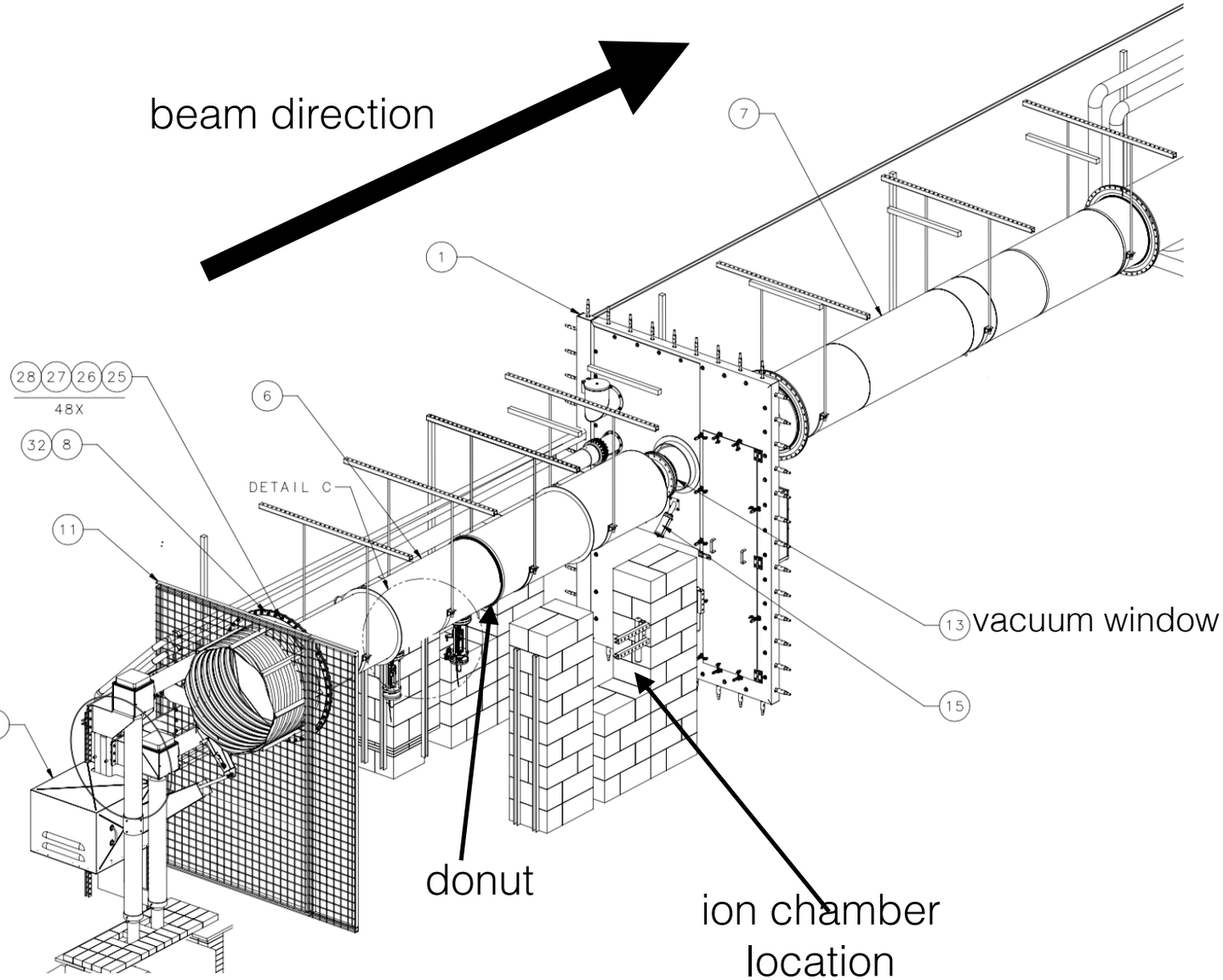




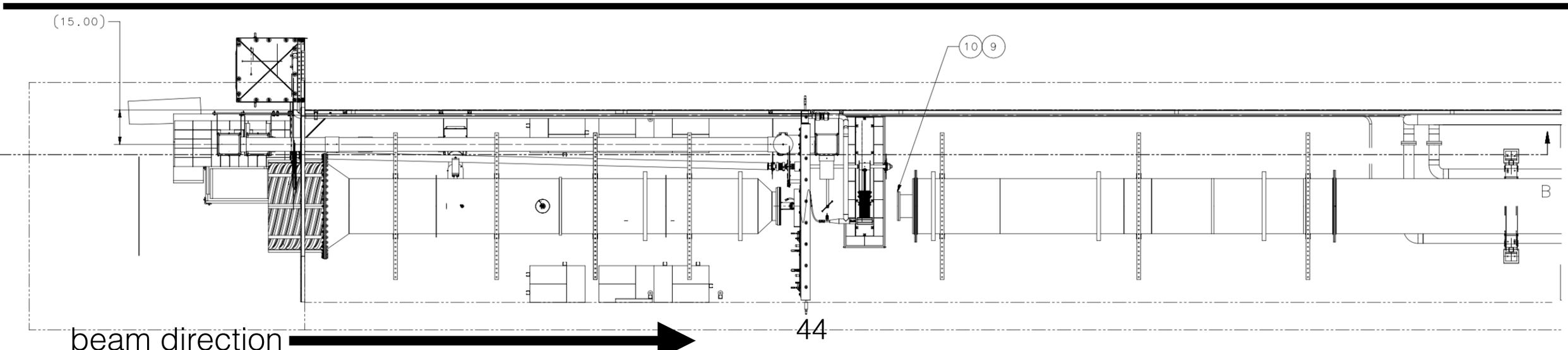




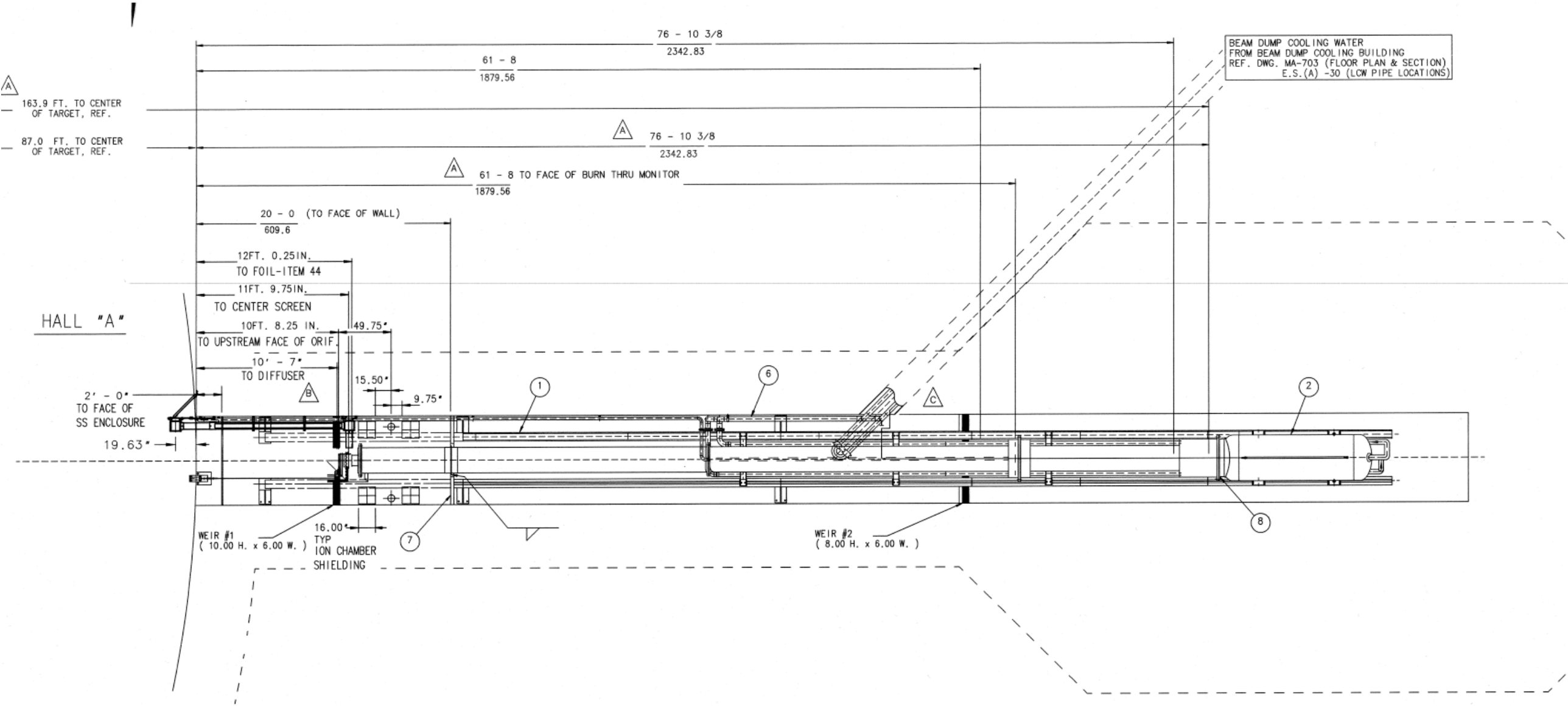
PREX 2 Dump configuration



- For PREX2/CREX we will not need to use the diffuser
- I have only implemented the beam pipe until the vacuum window and added the Al wall



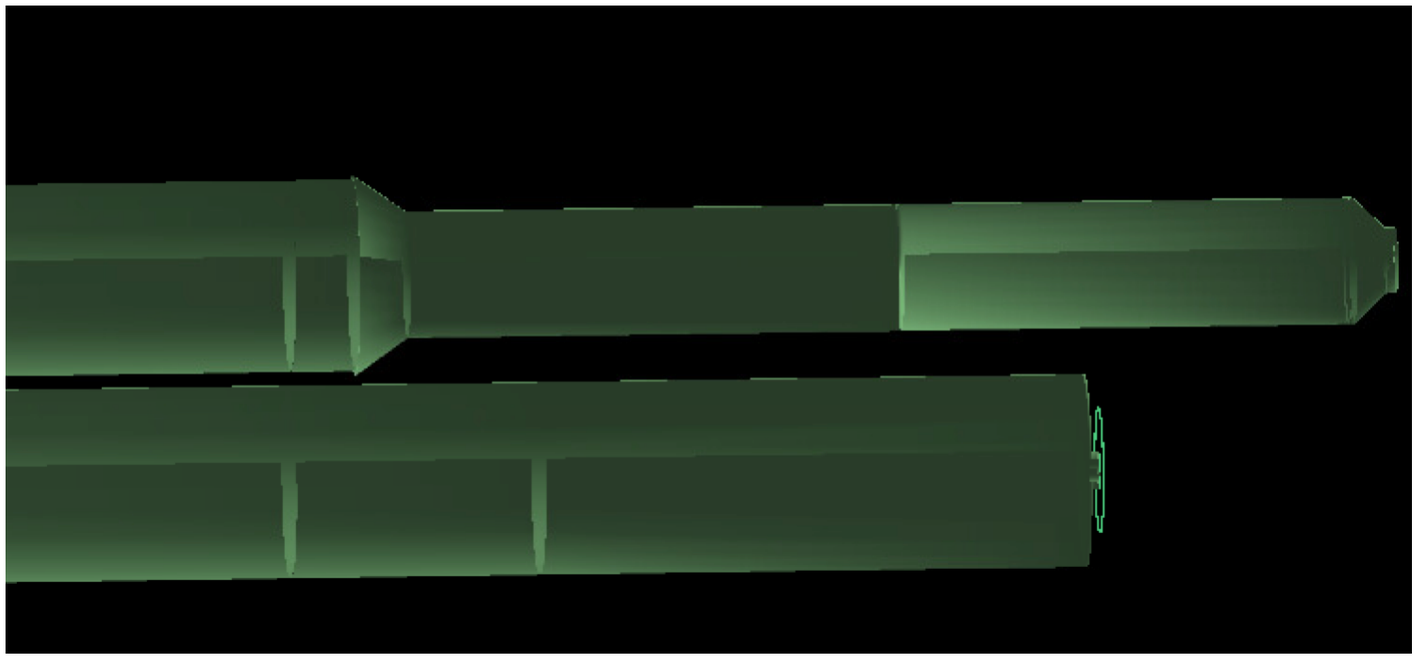
PREX 1 dump configuration

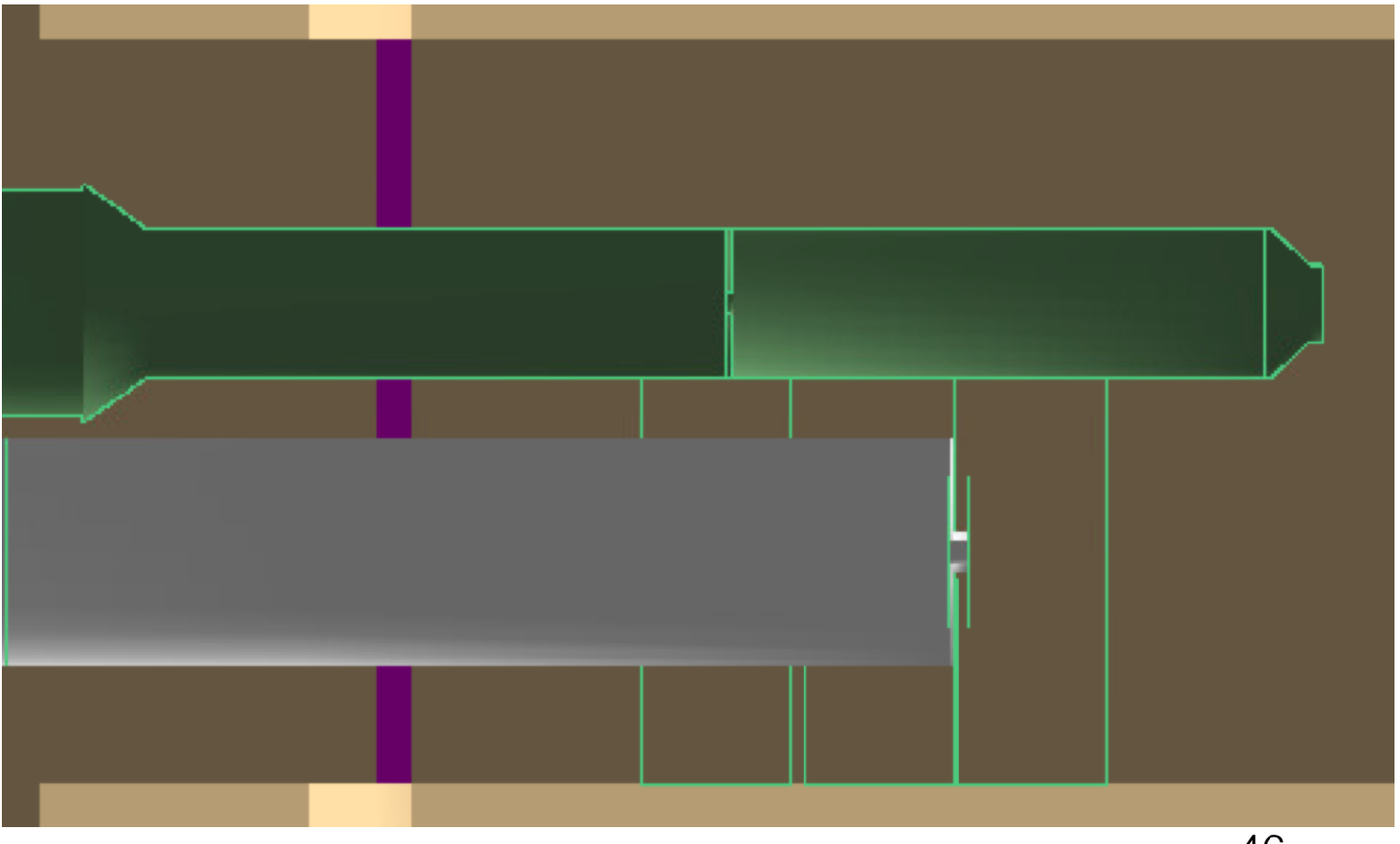


- Dump configuration was different than what we had in the simulation

- The beam pipe has an Aluminum aperture that is about 4in in diameter in about the same location as the donut is now

GDML implementation

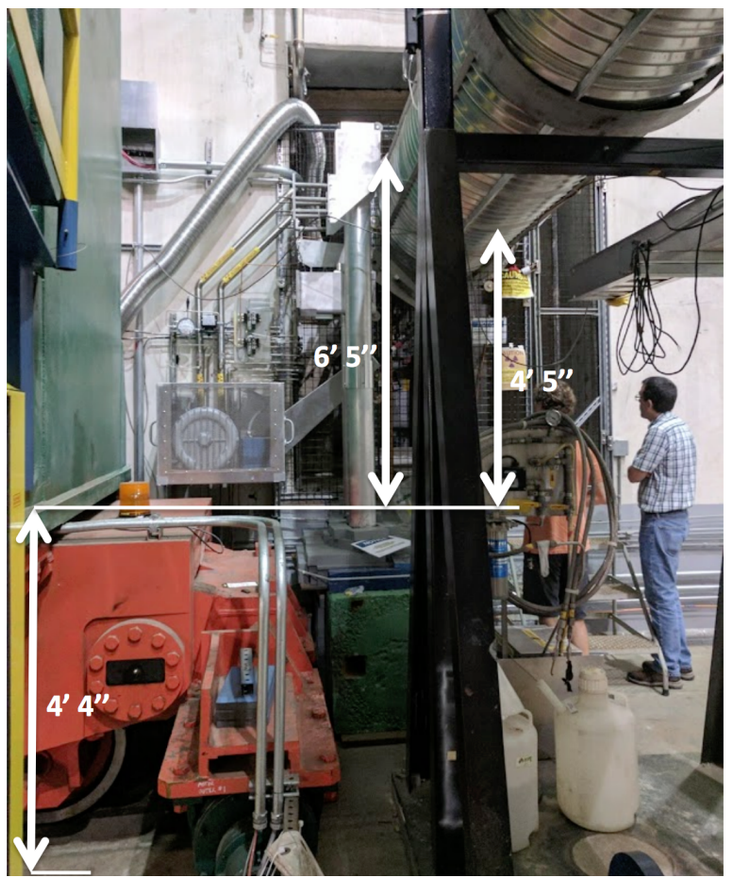


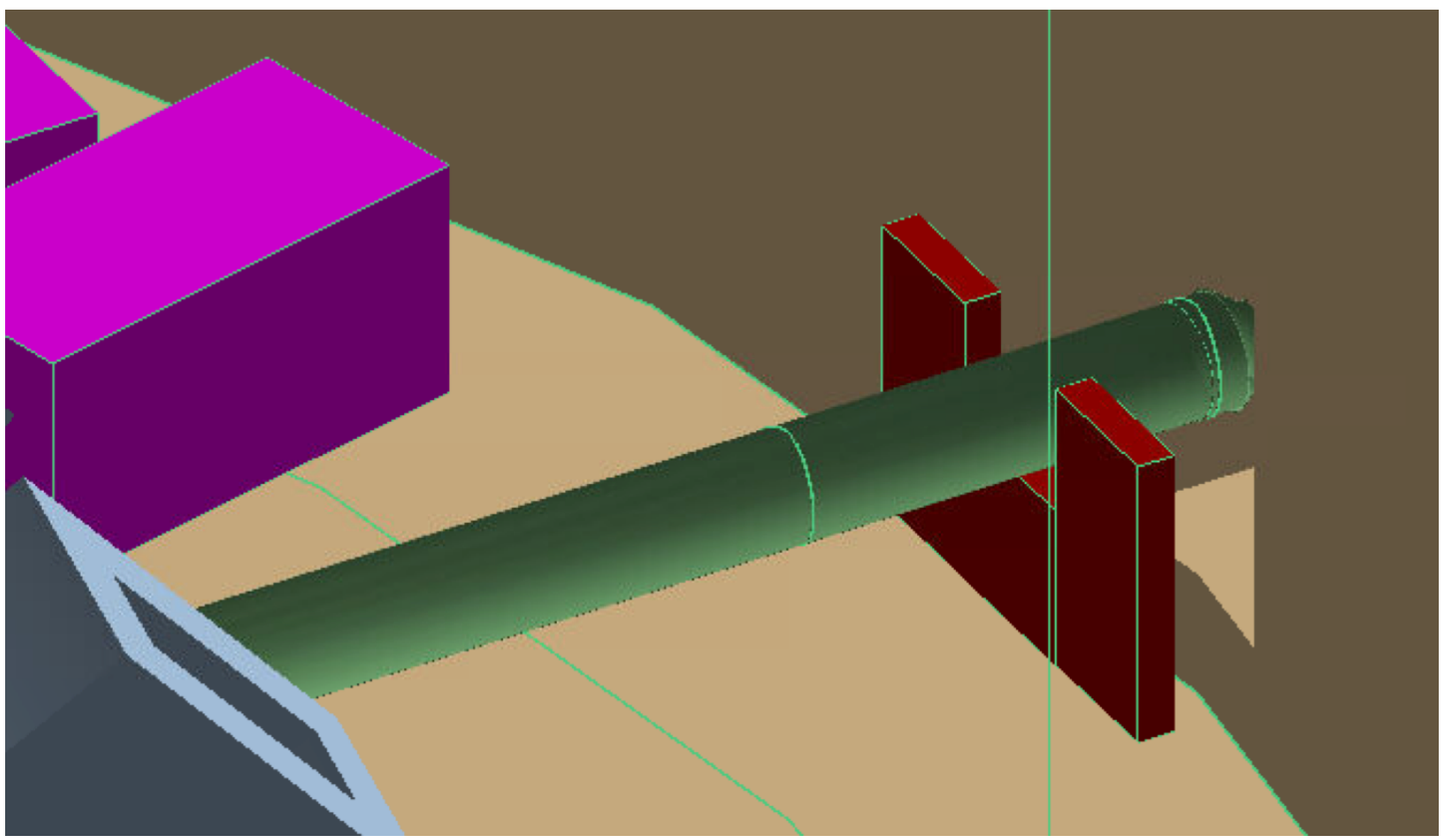


- Furthermore Kent noticed that the neck down in my configuration didn't match the drawing (or reality)

- now the neck-down is right after the wall similarly to what we have in the hall

Shielding concept

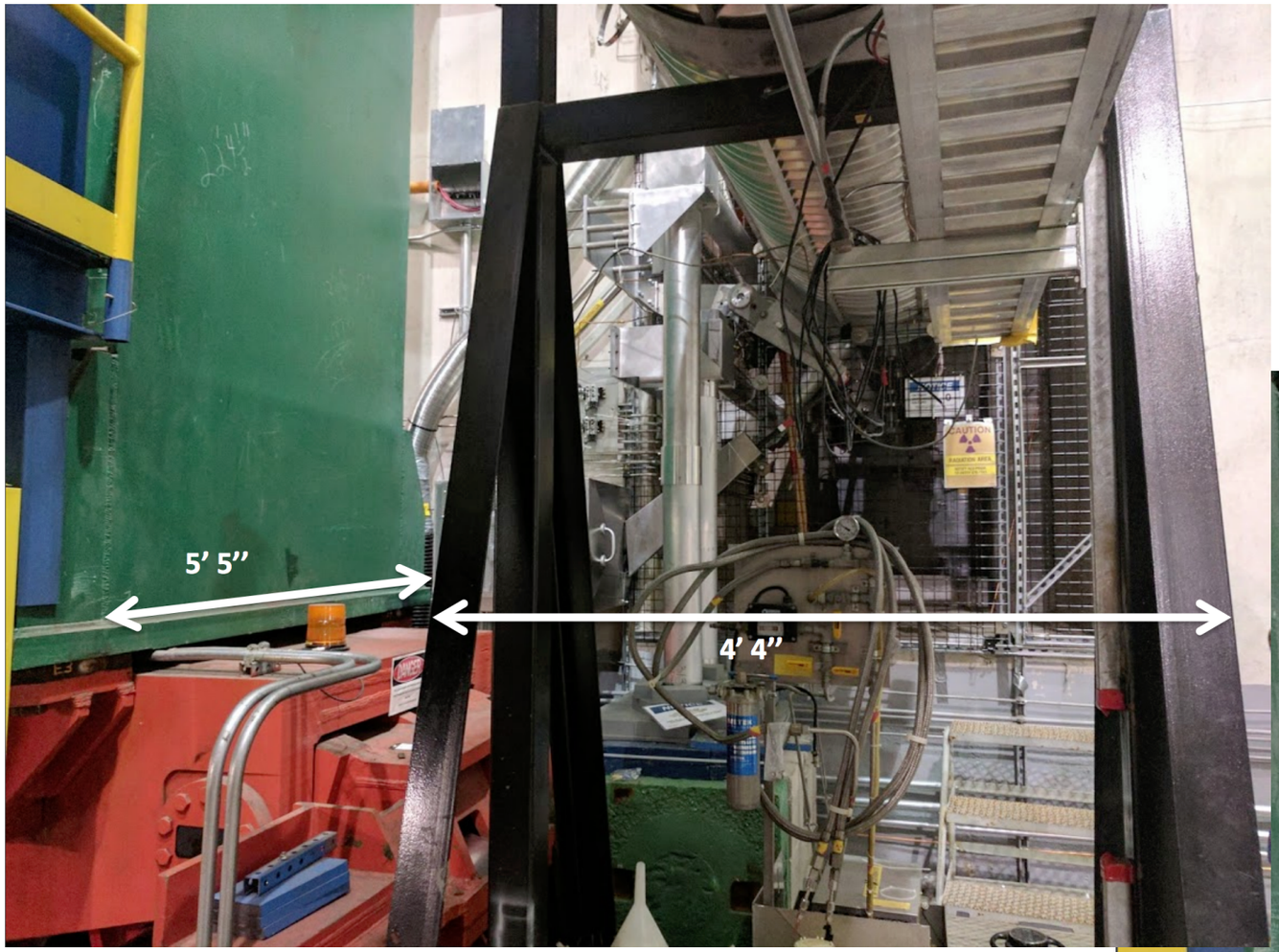


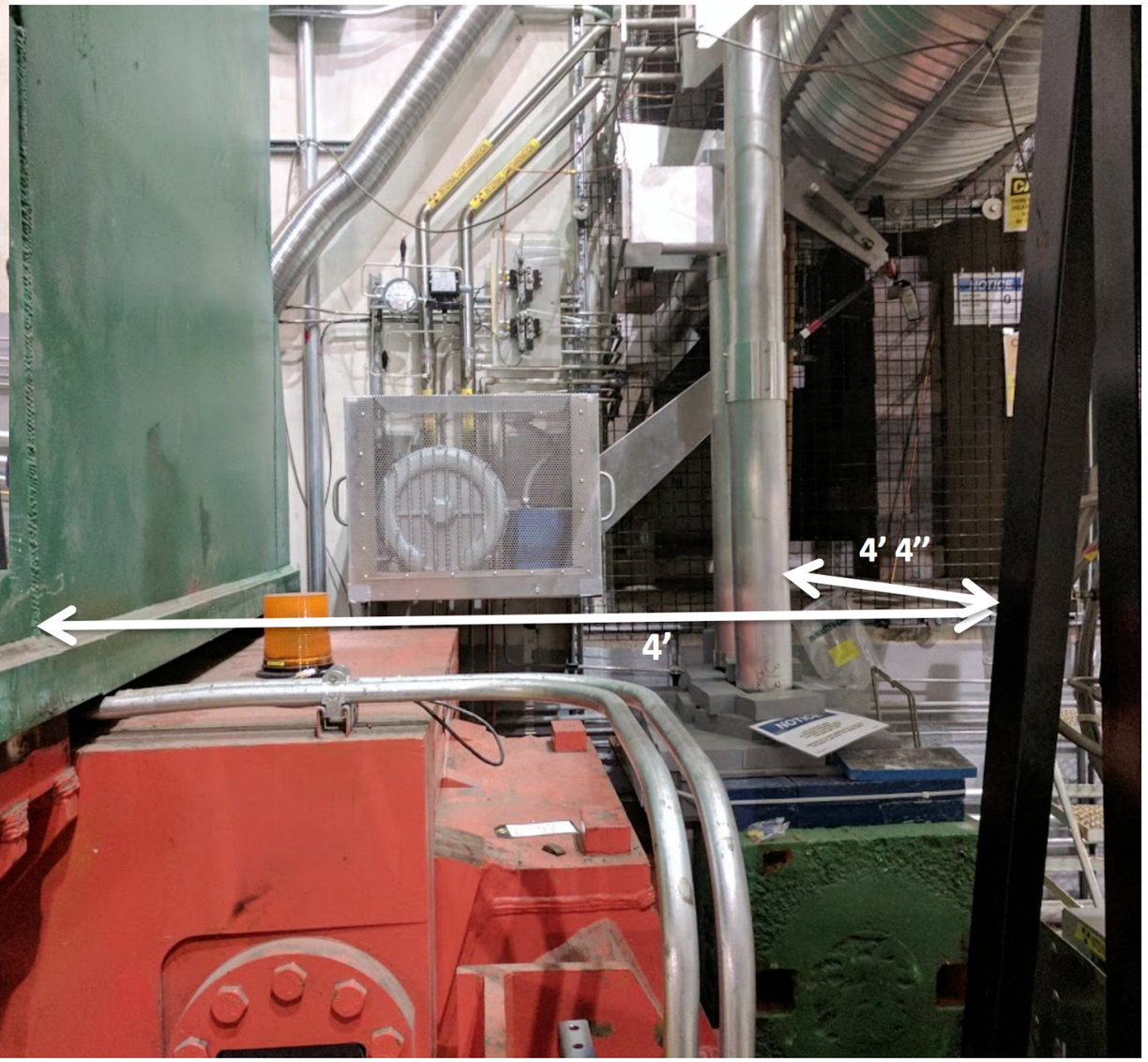


- Sanghwa, Dave and I went over to the hall and we made some measurement of the space available to us with the HRS parked in the 12.5 deg position

- I implemented 3 simple 1 foot thick shielding blocks in the simulation (ran for both concrete and Polyethylene)

Hall Configuration

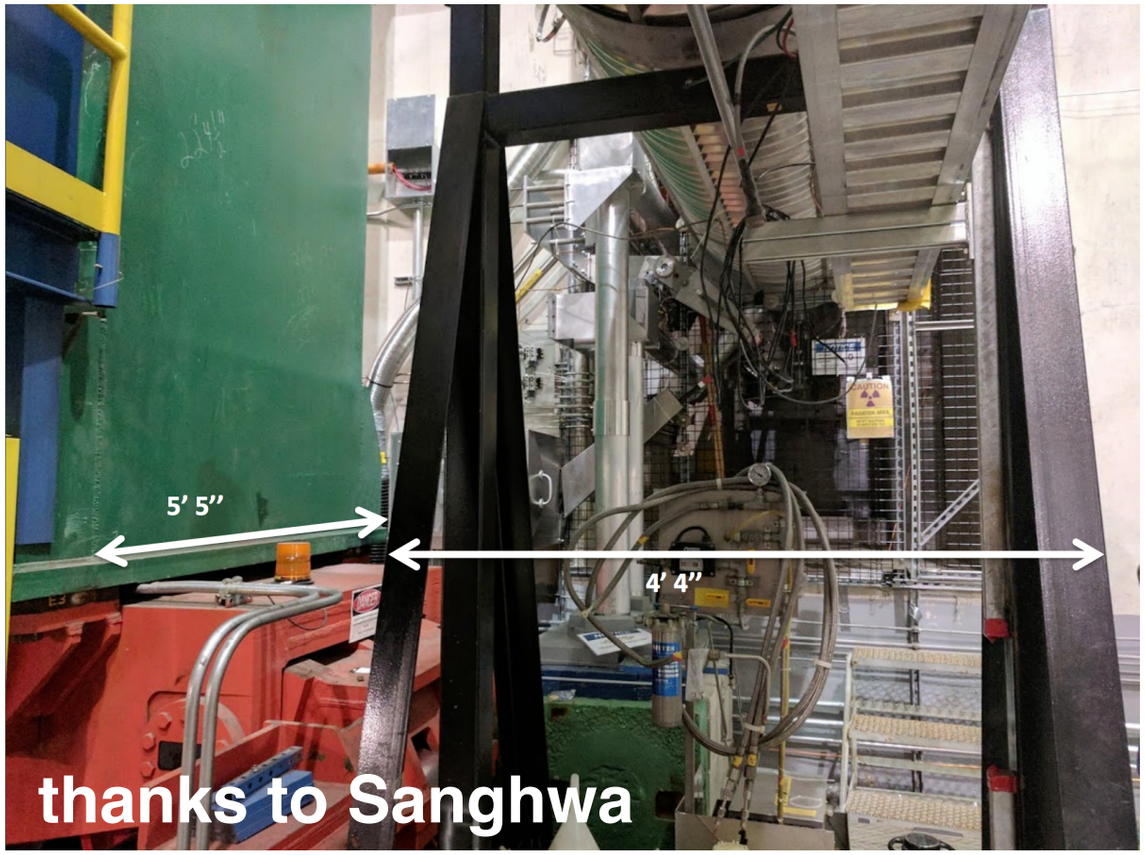


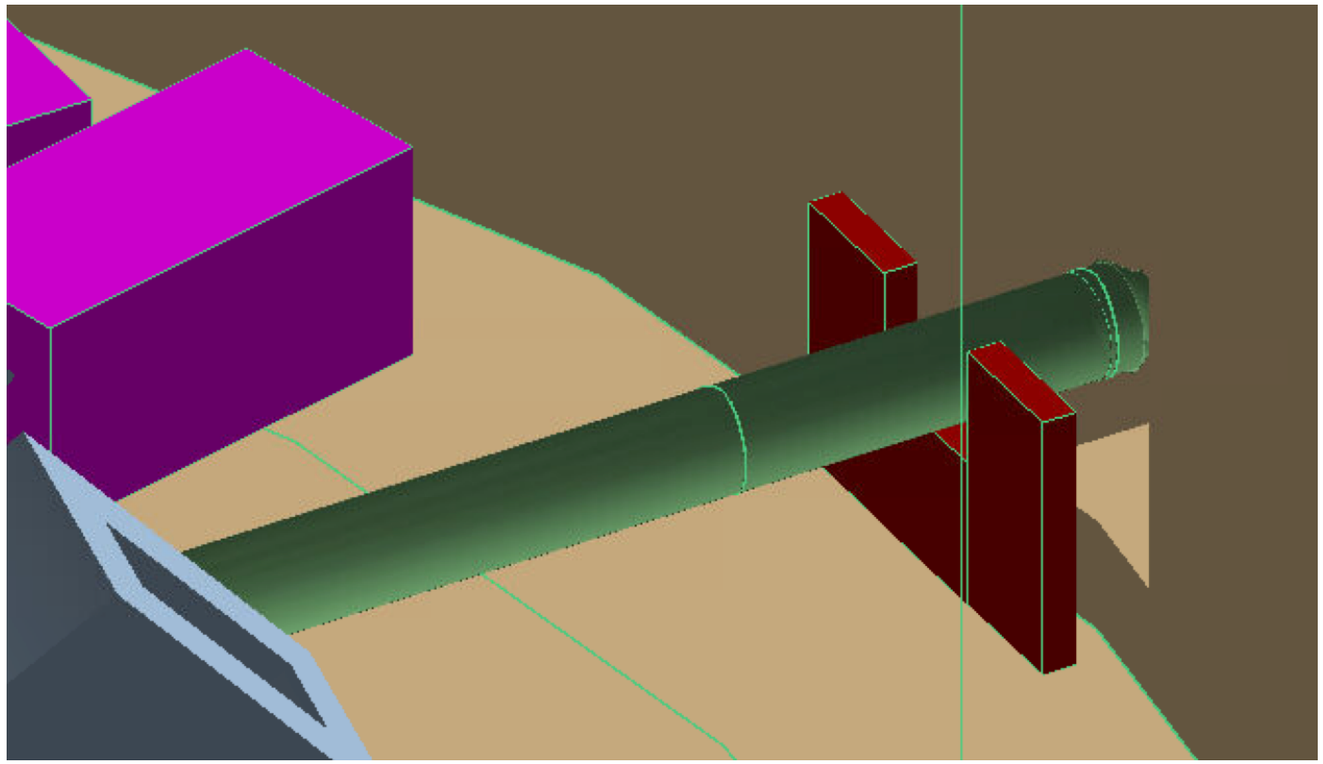


- 10 cm thick Steel wall (in green) is not present in our simulation

thanks to Sanghwa

Hall Configuration

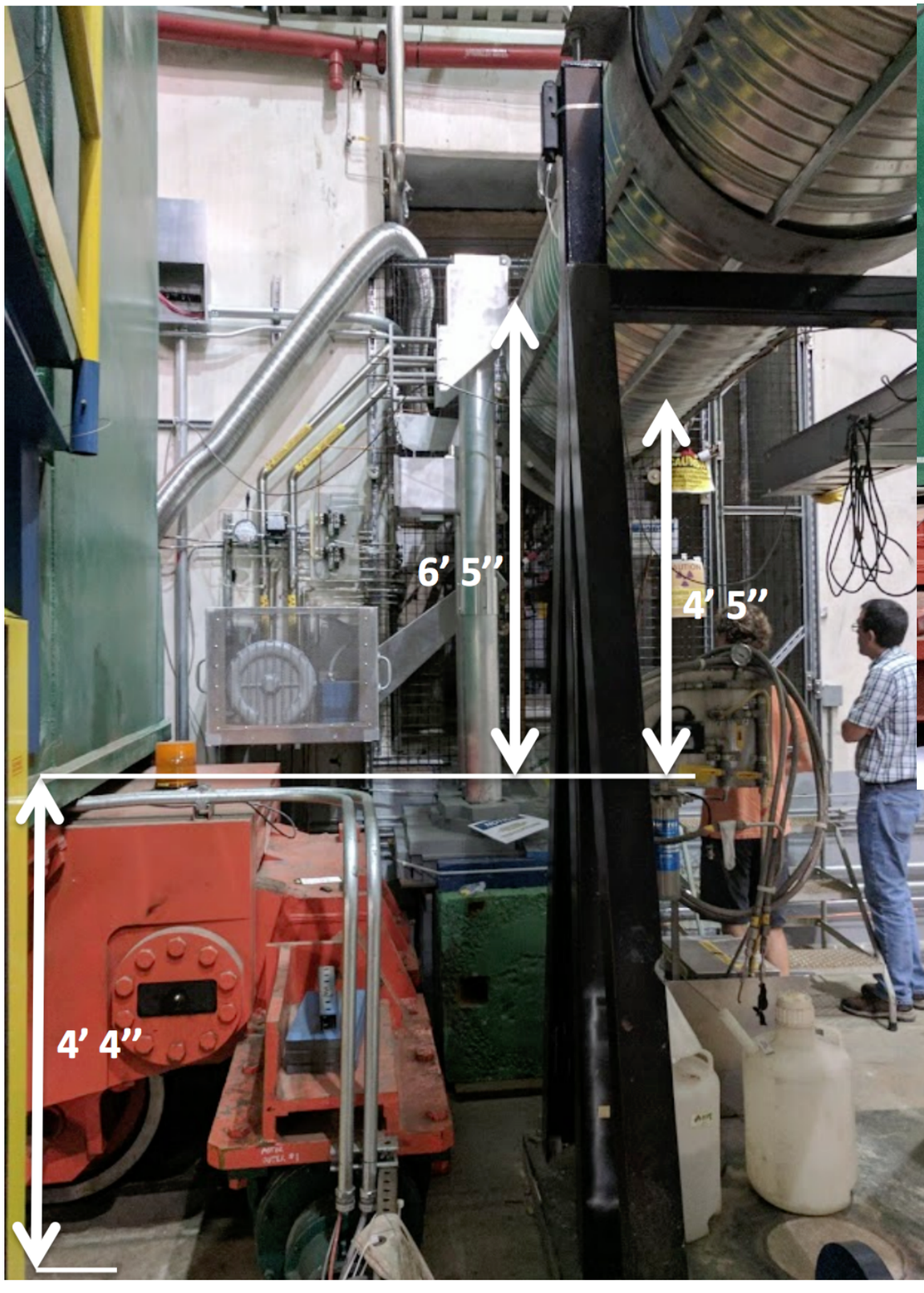


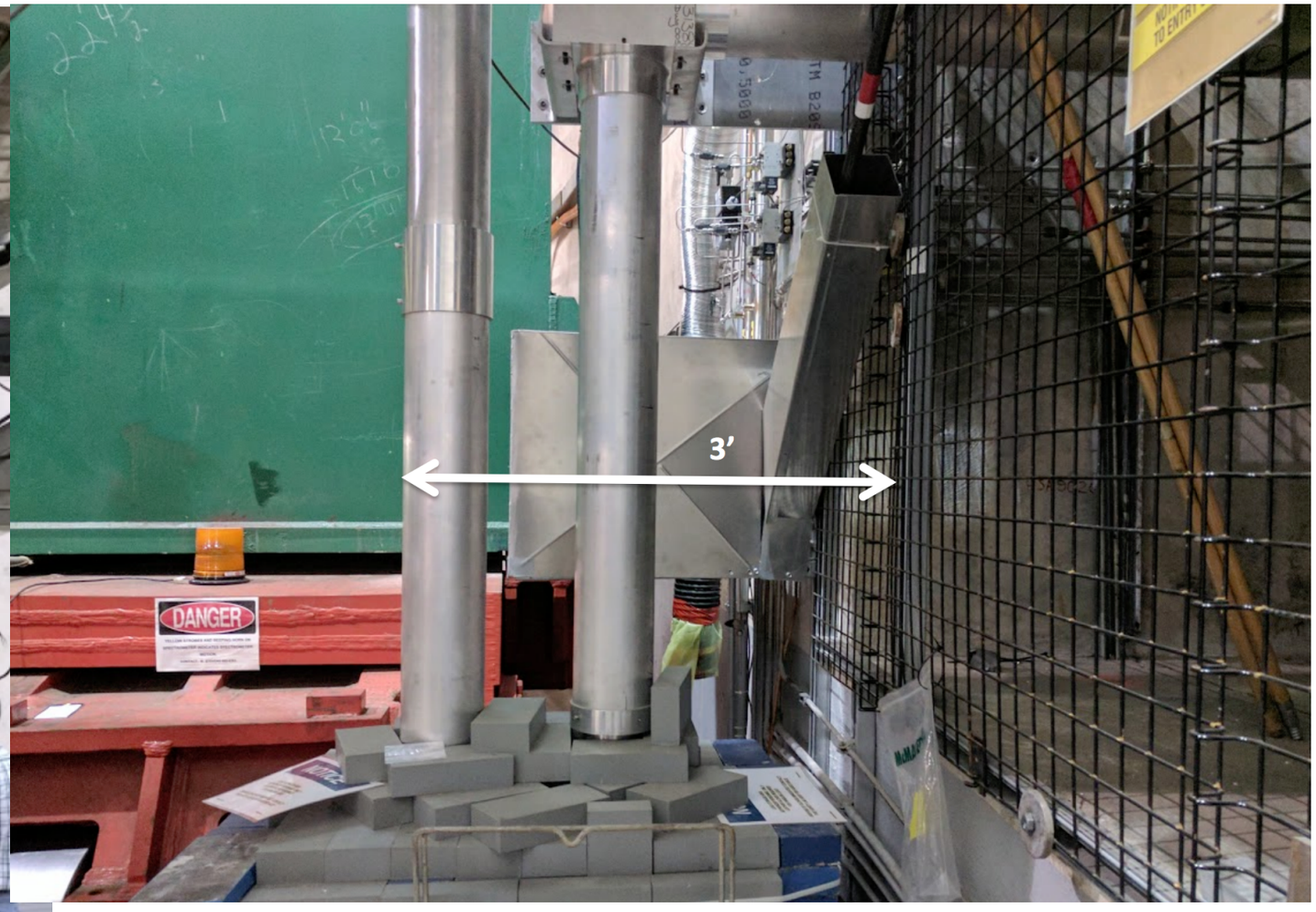


- 10 cm thick Steel wall (in green) is not present in our simulation

- moreover, the hrs “electronics box” we have now doesn’t cover the whole area where electronics exist and may be too forward

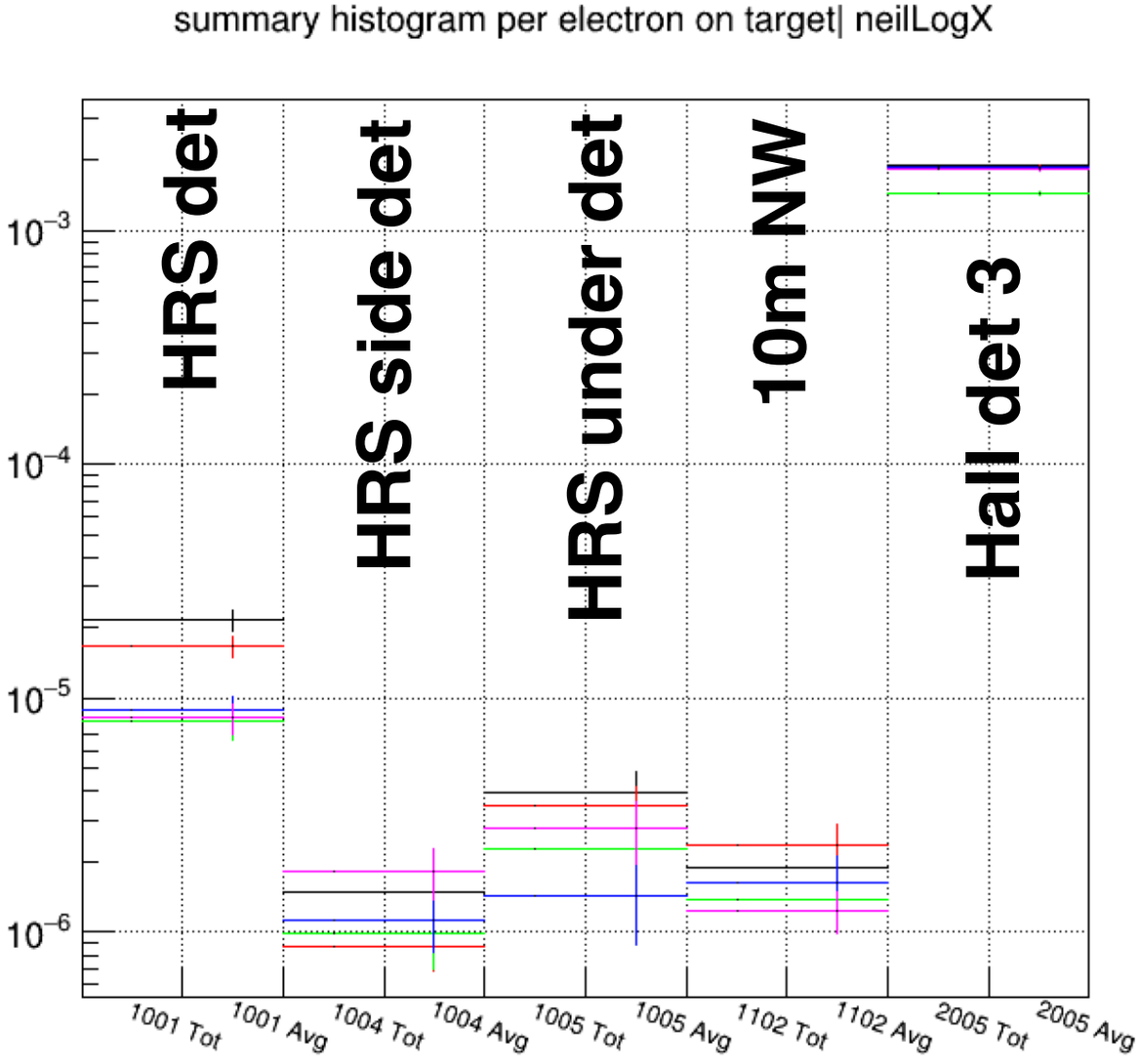
Hall Configuration

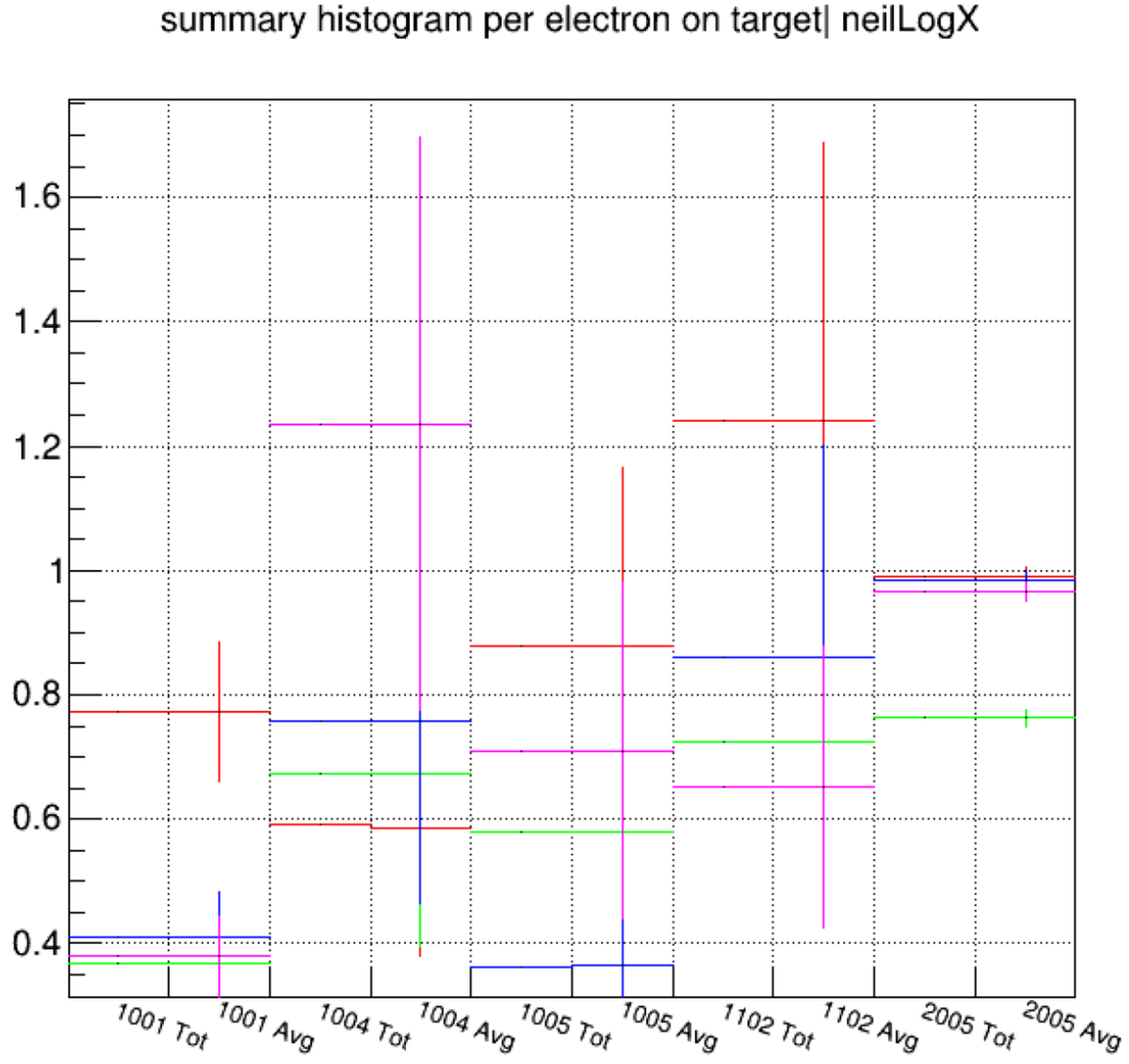




thanks to Sanghwa

PREX2 - HRS rad damage

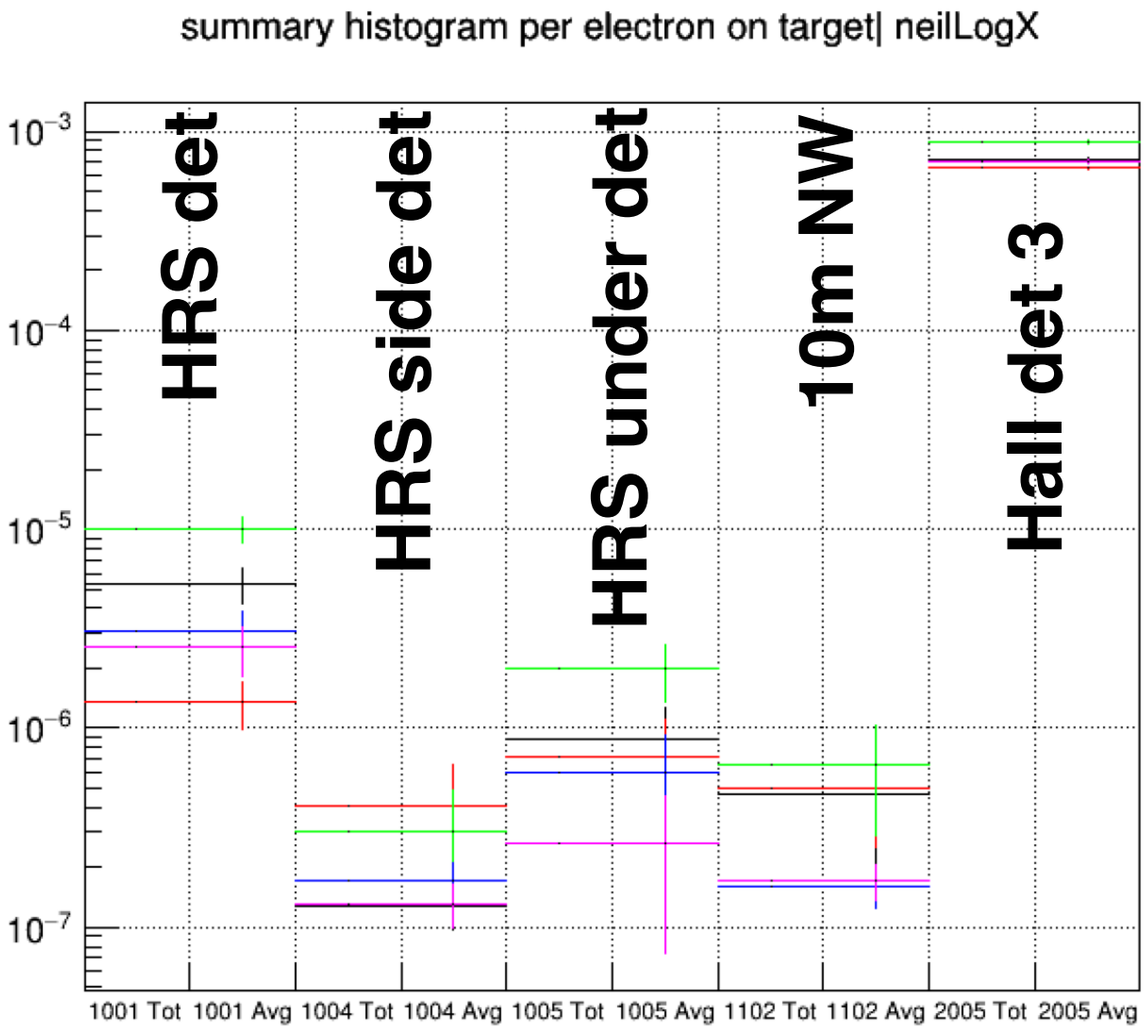


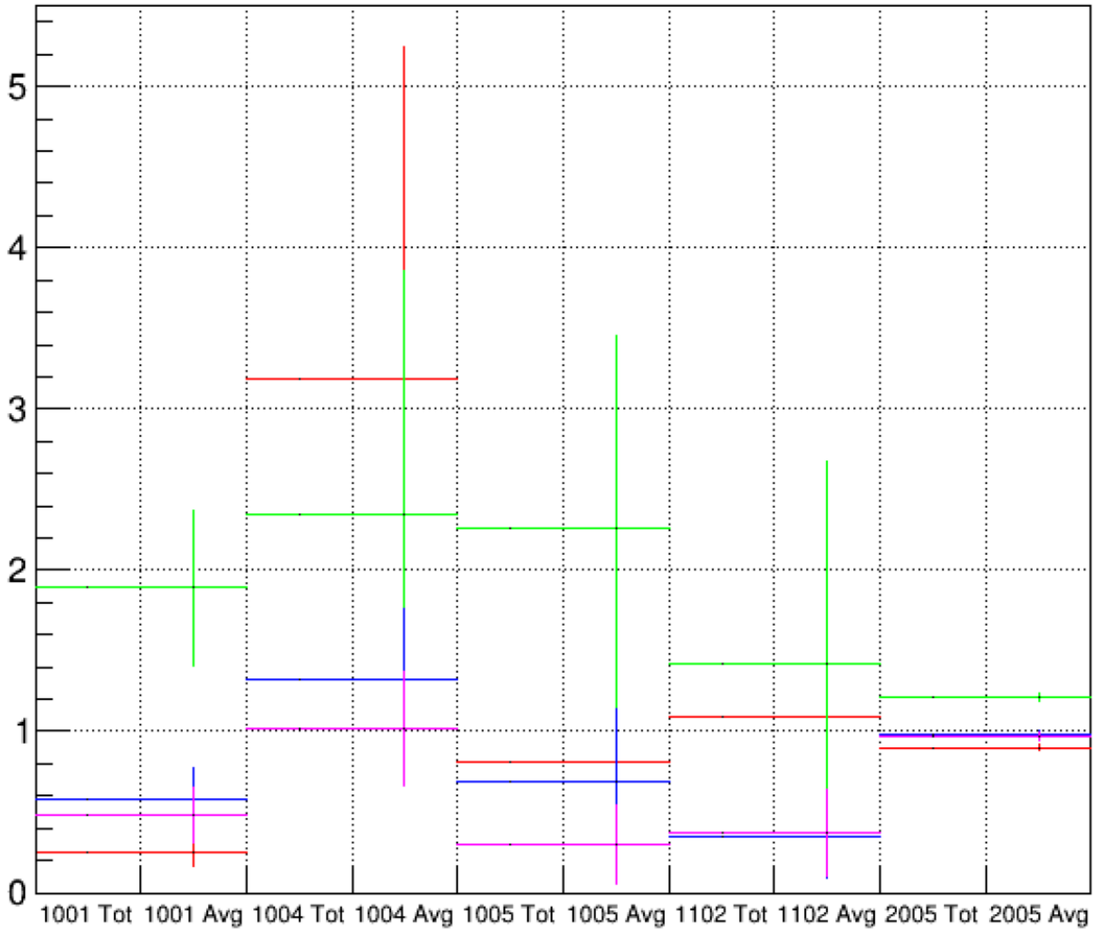


Black: current setup
Red: current setup + 4 in donut
Green: PREX 1 dump
Blue: current setup + concrete Shield
Magenta: current setup + Poly Shield

- Best configuration seems to be the PREX1 beam pipe, followed closely by the current pipe with shielding

CREX - HRS rad damage





Black: current setup
Red: current setup + 4 in donut
Green: PREX 1 dump
Blue: current setup + concrete Shield
Magenta: current setup + Poly Shield

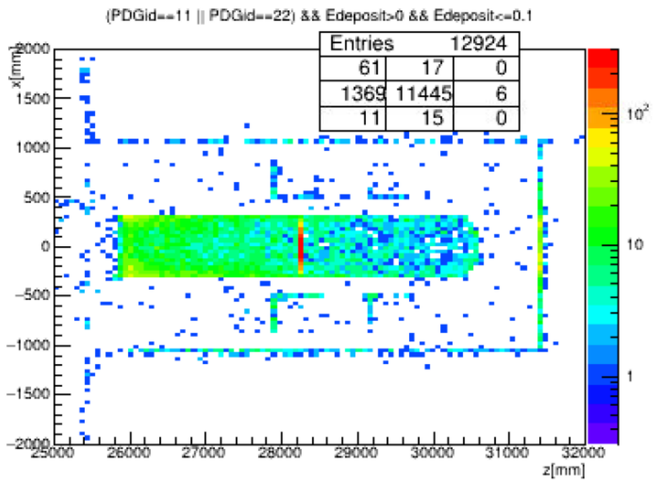
- For CREX having a large aperture can provide significant improvement

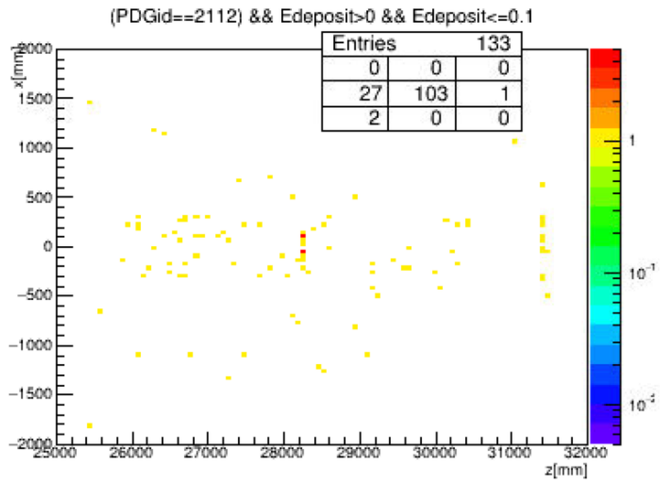
Plots with electrons plus gammas

PREX2 - current dump

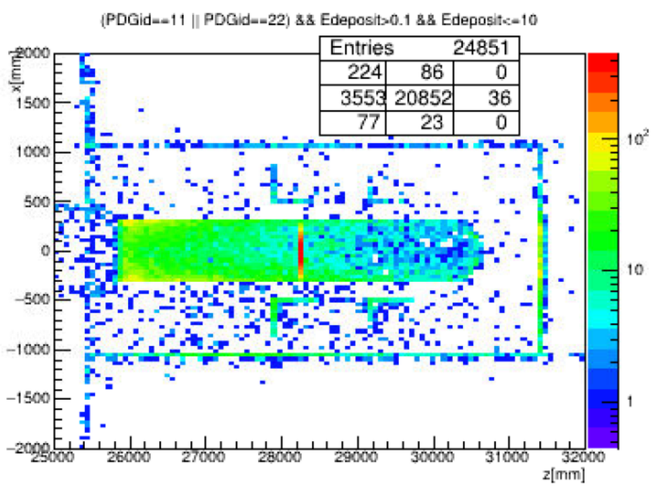
electrons+photons

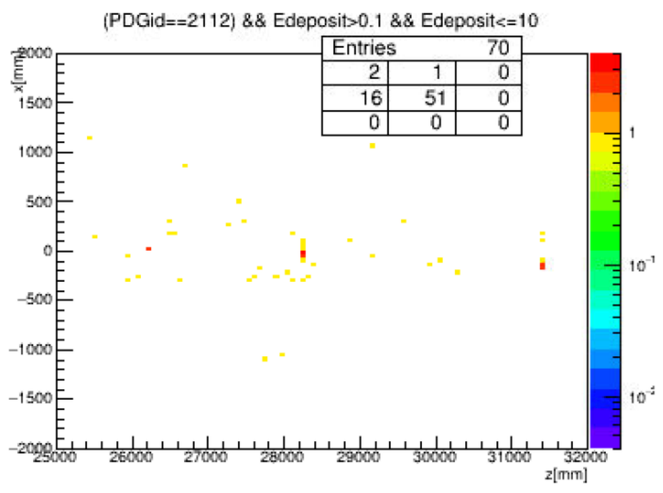
neutrons



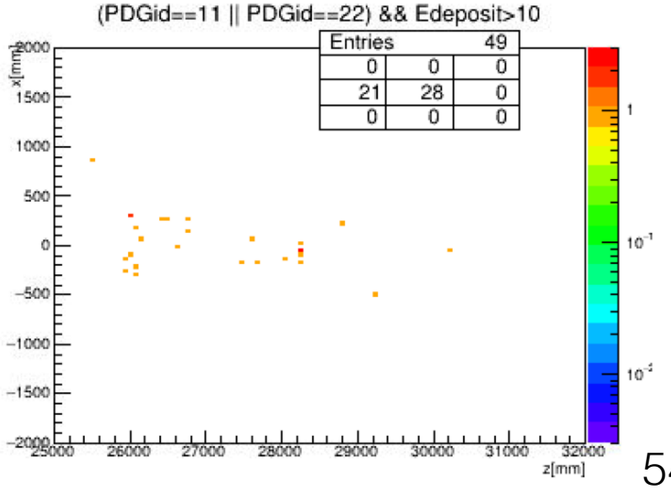


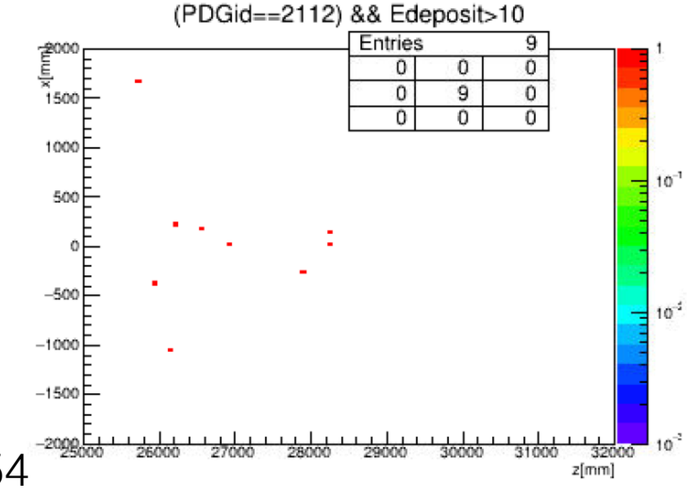
0<E<=0.1 MeV





0.1<E<=10 MeV

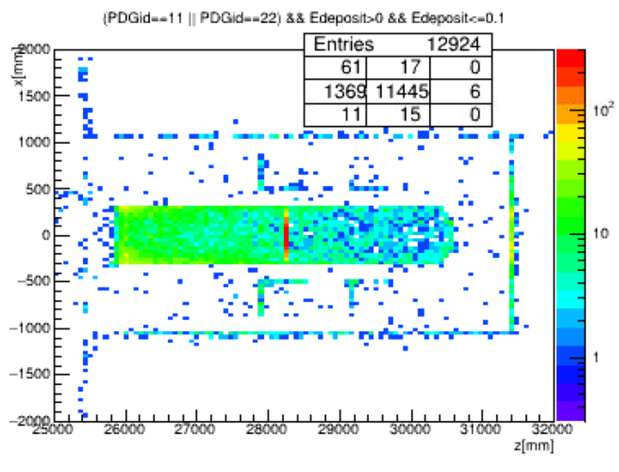


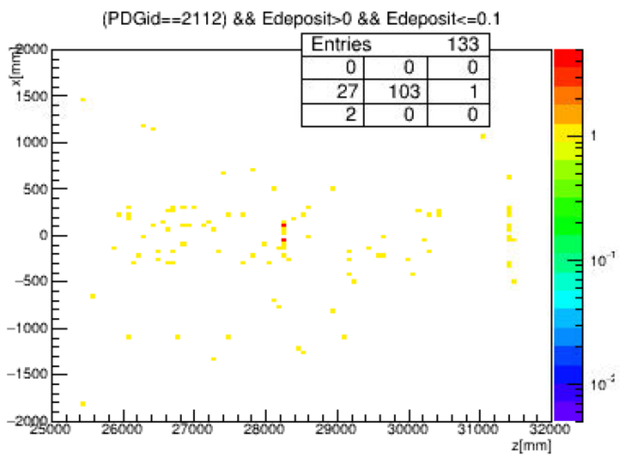


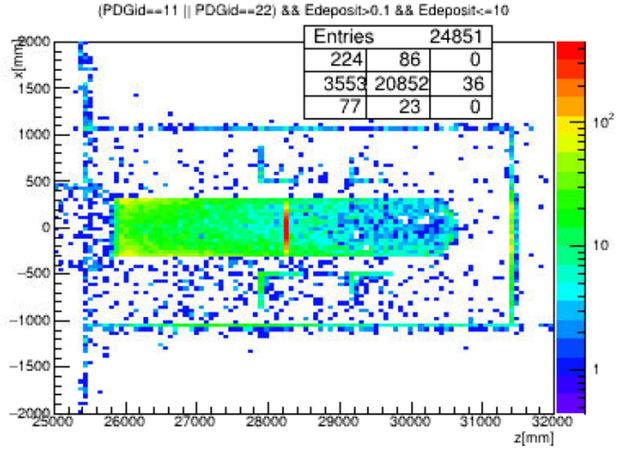
10<E MeV

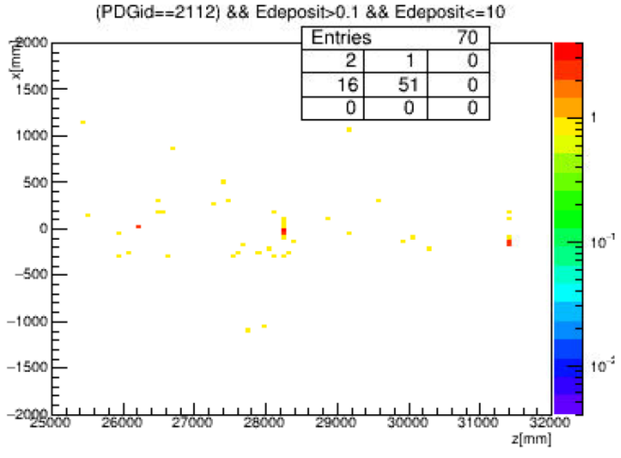
PREX2 - comparison

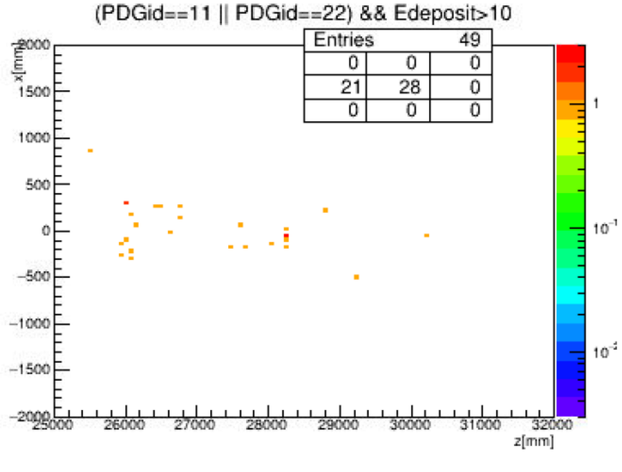
current setup

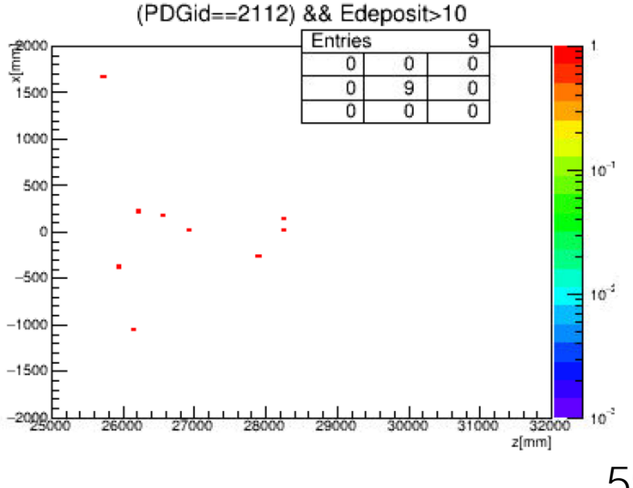




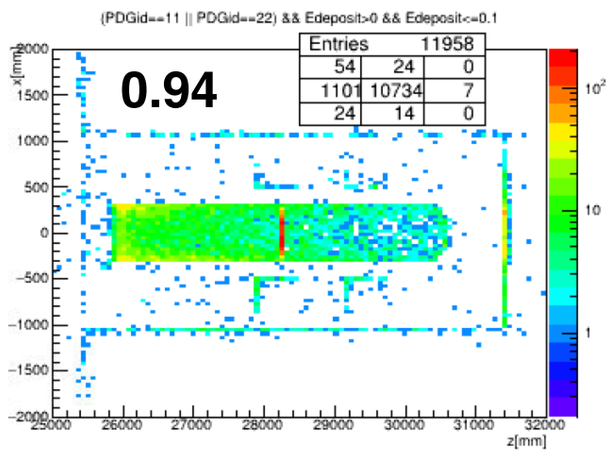


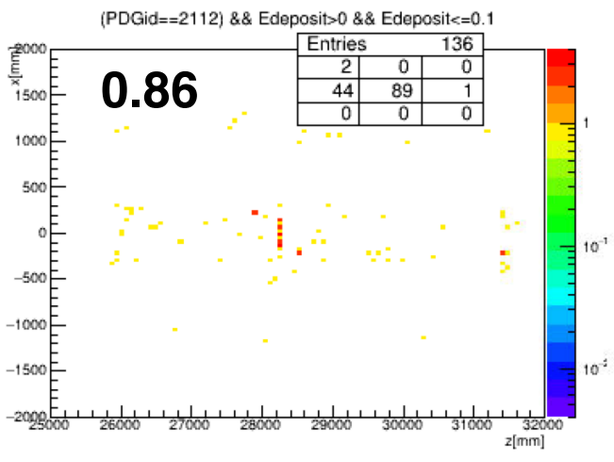


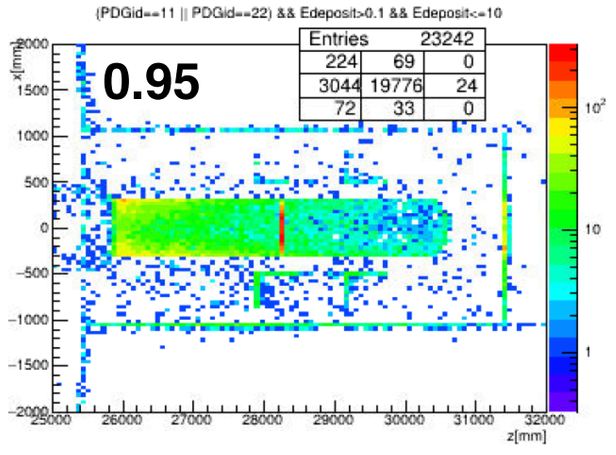


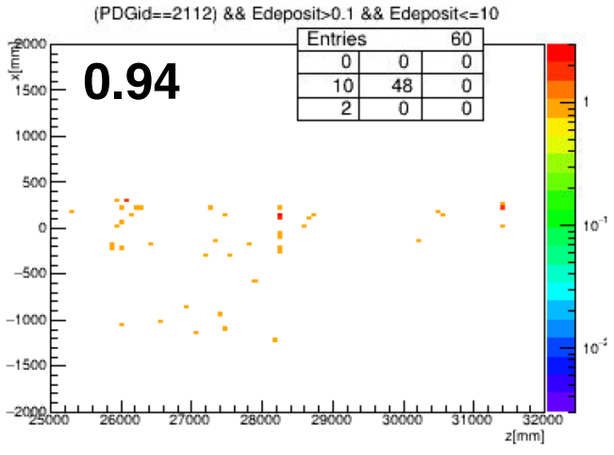


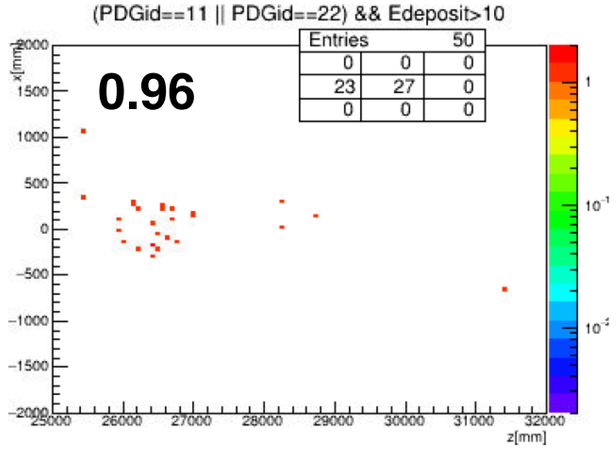
current setup + 4 in donut

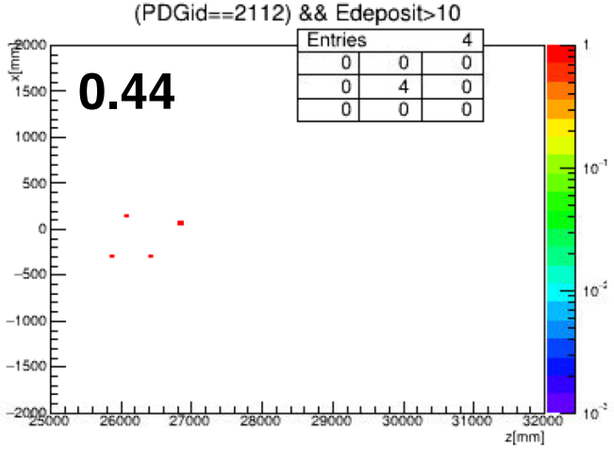






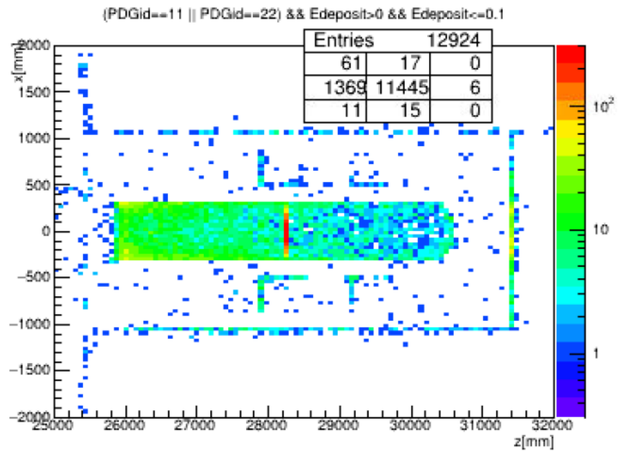


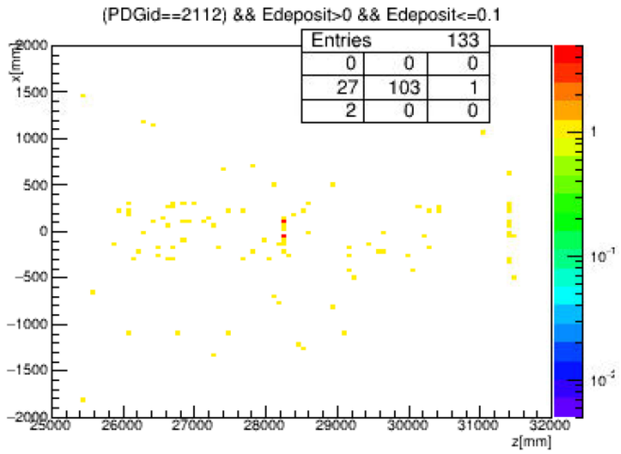


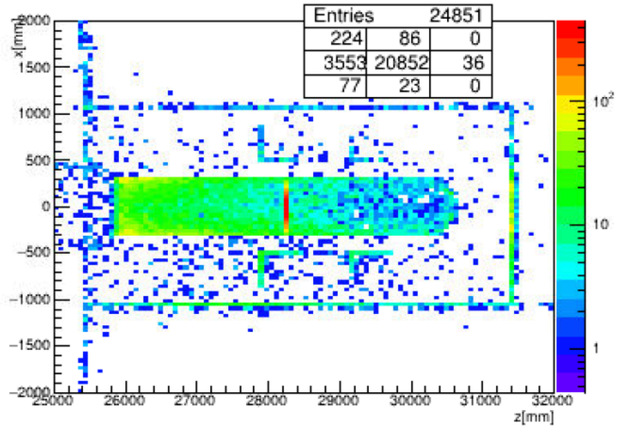


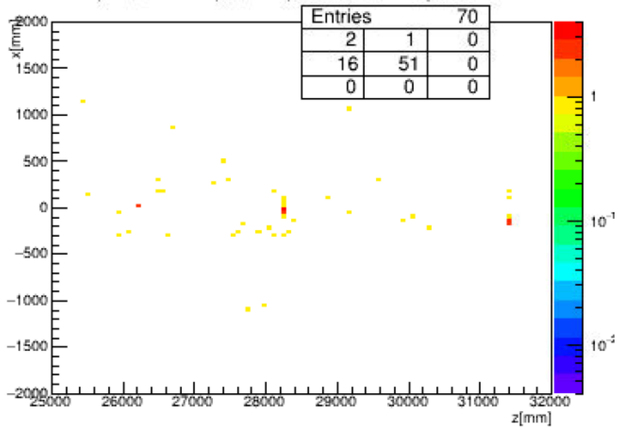
PREX2 - comparison

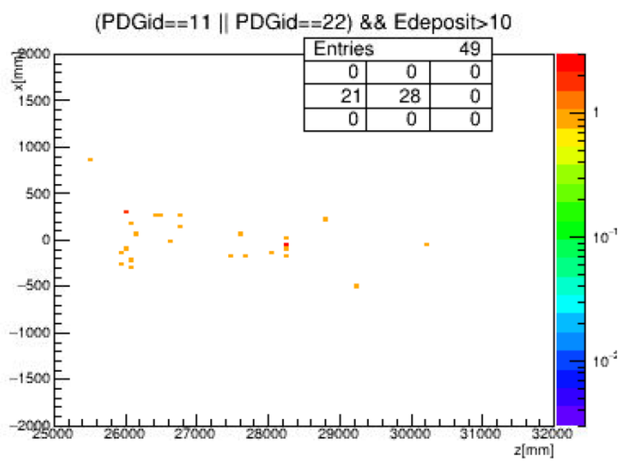
current setup

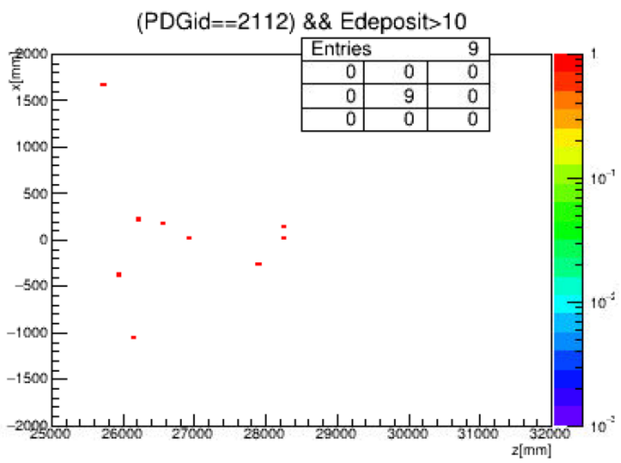




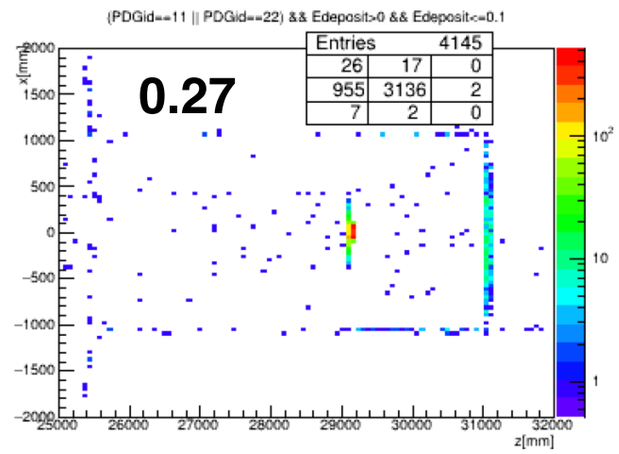


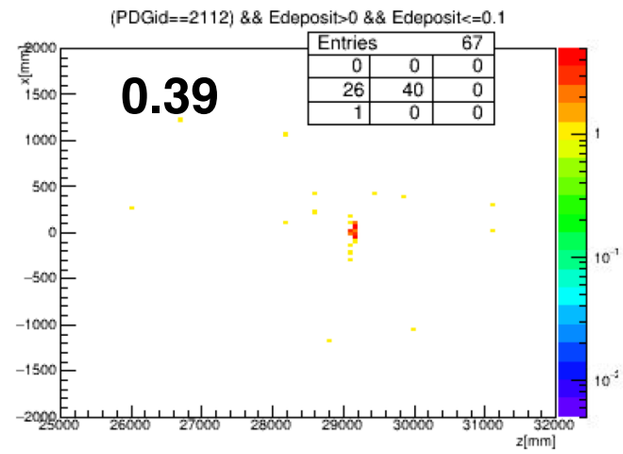


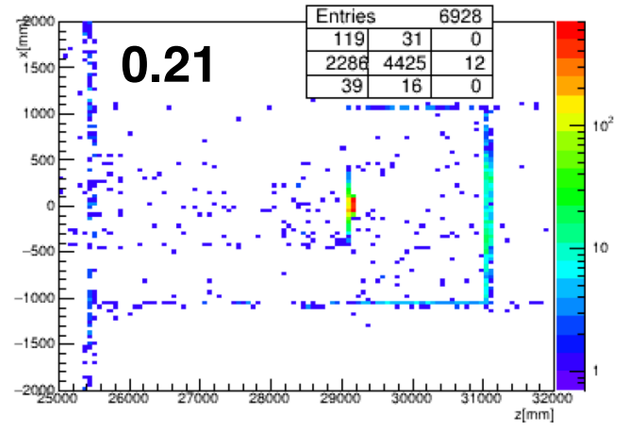


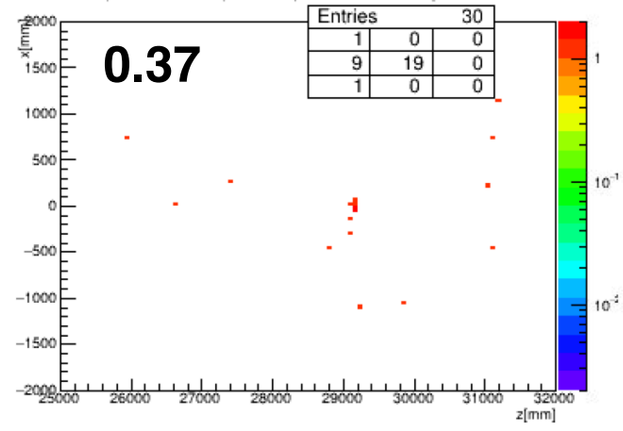


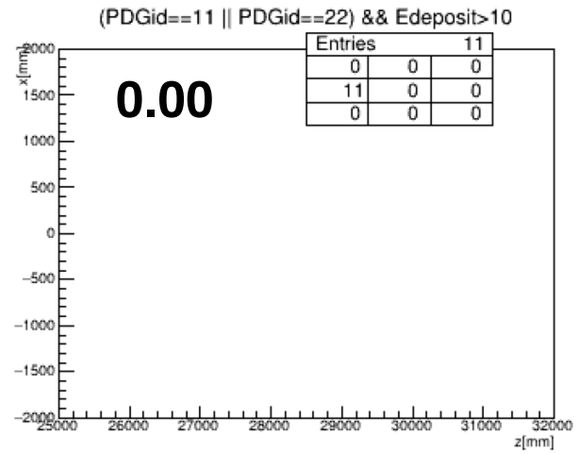
PREX1 dump configuration

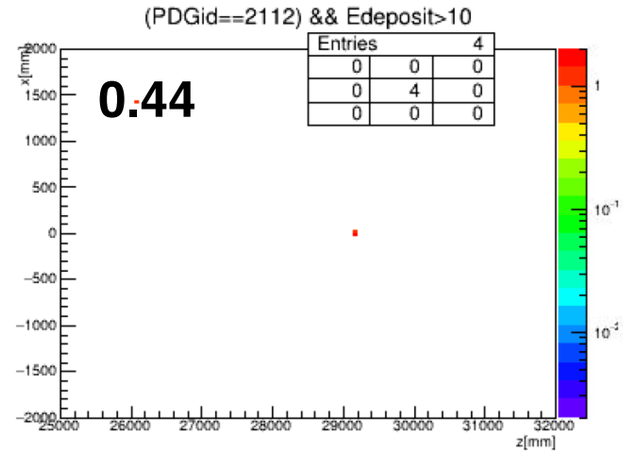






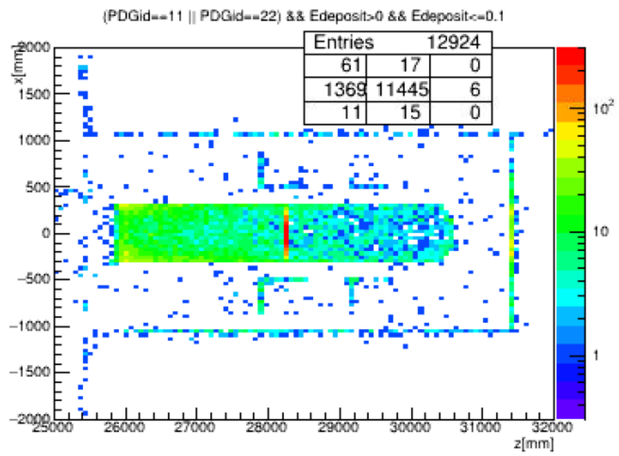


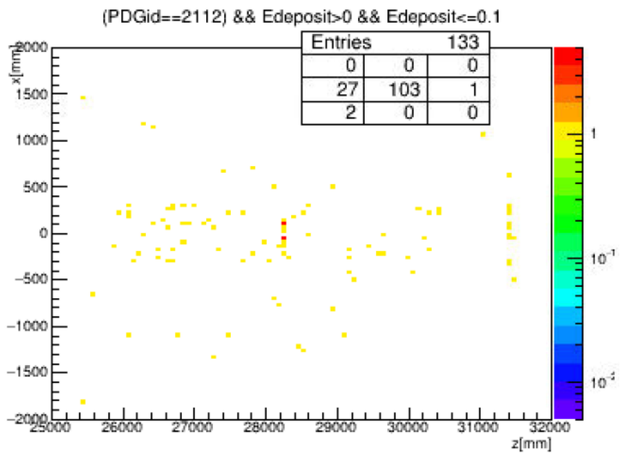


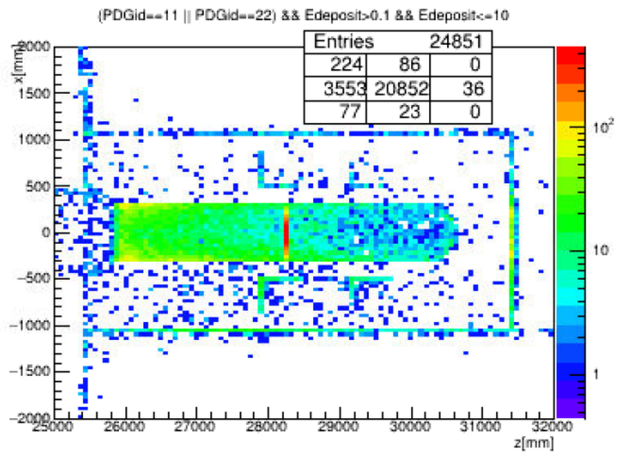


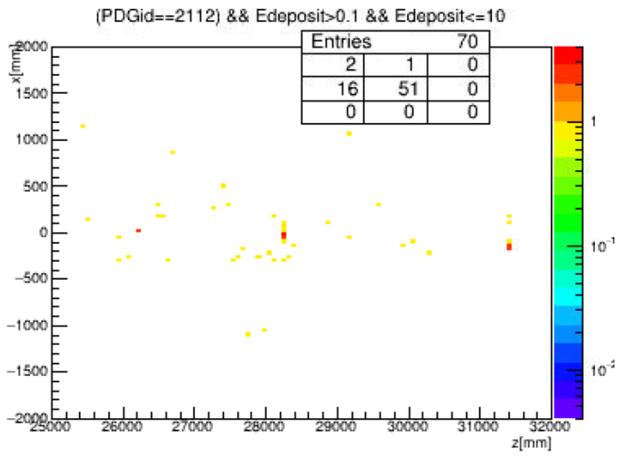
PREX2 - comparison

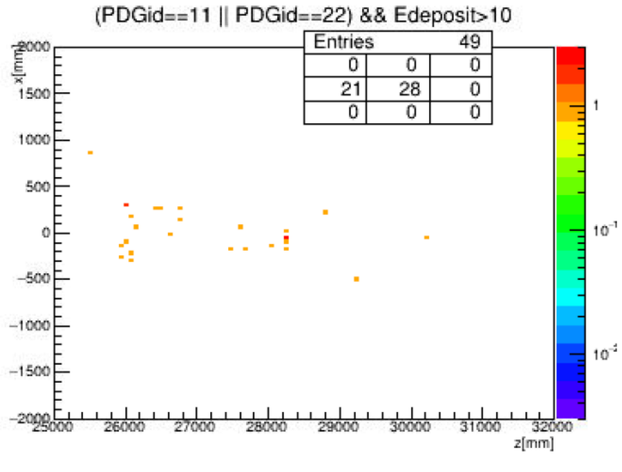
current setup

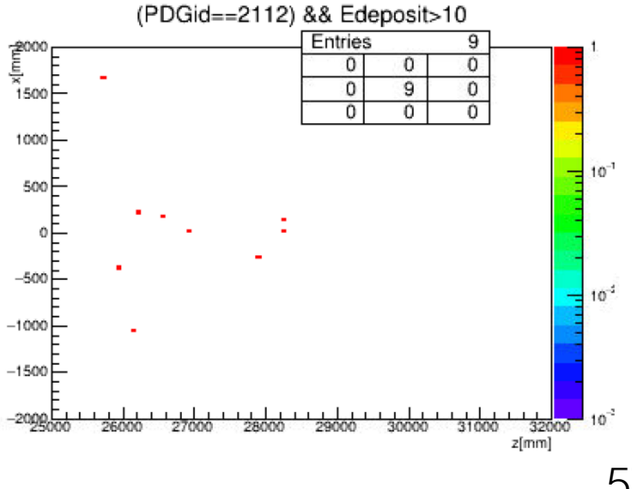




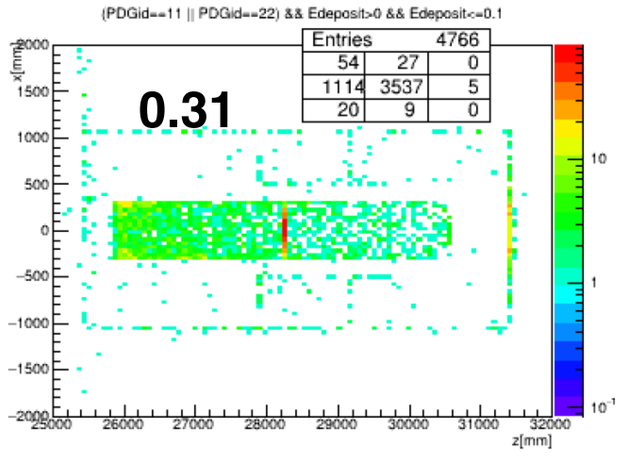


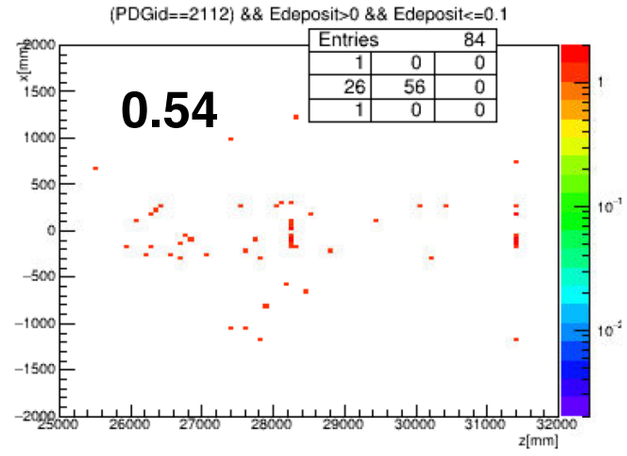


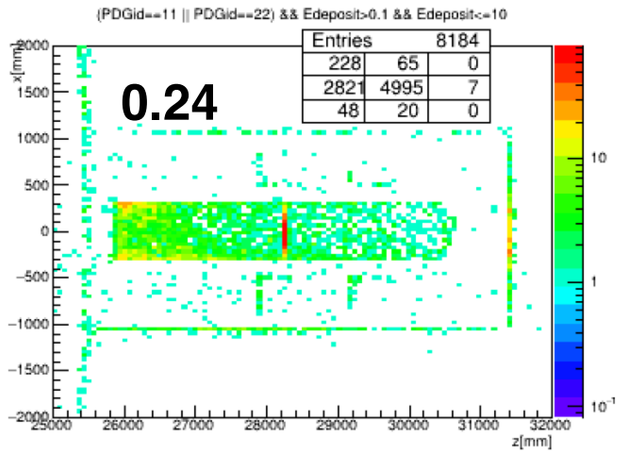


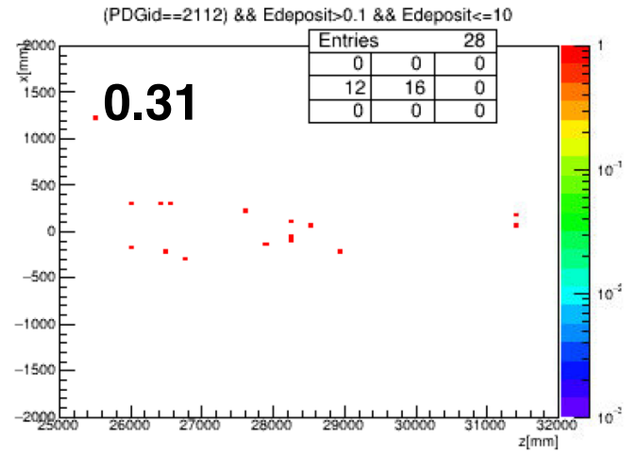


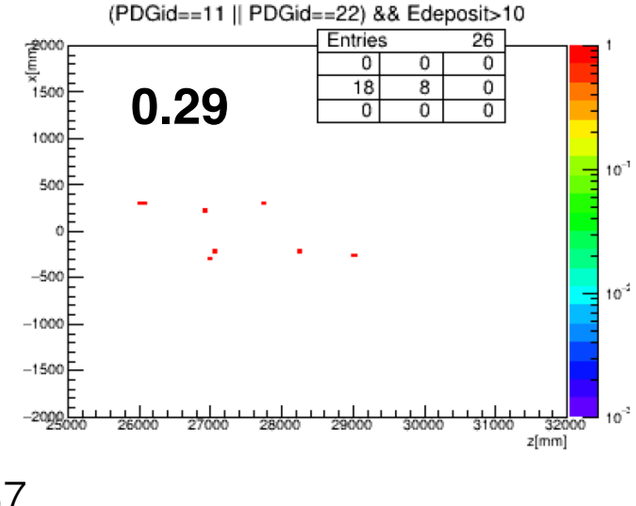
current setup + 1 ft concrete shield

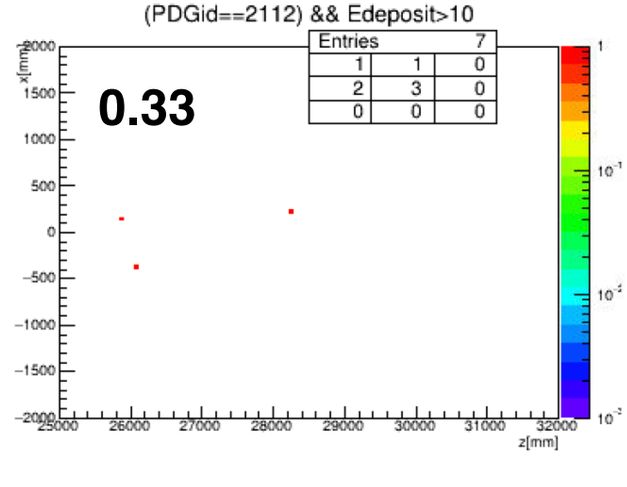






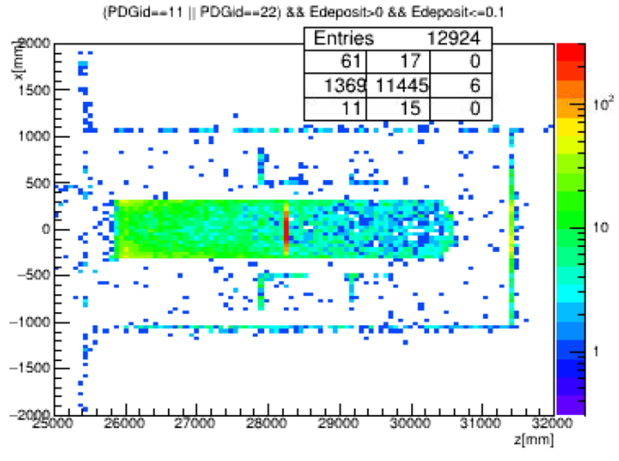


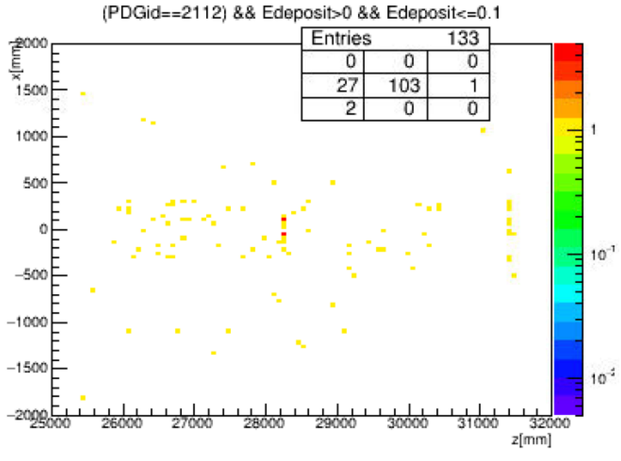


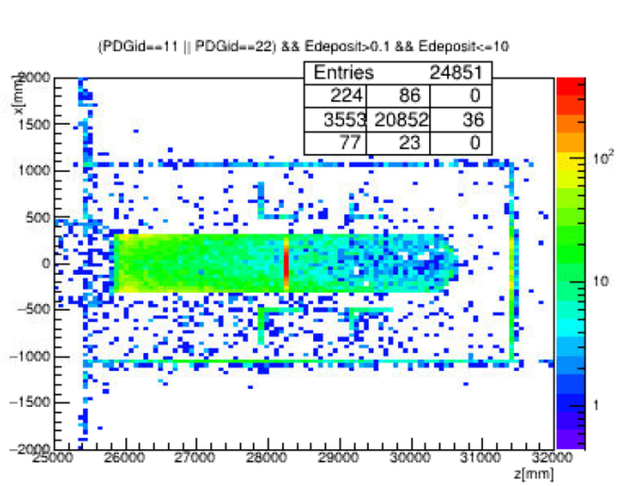


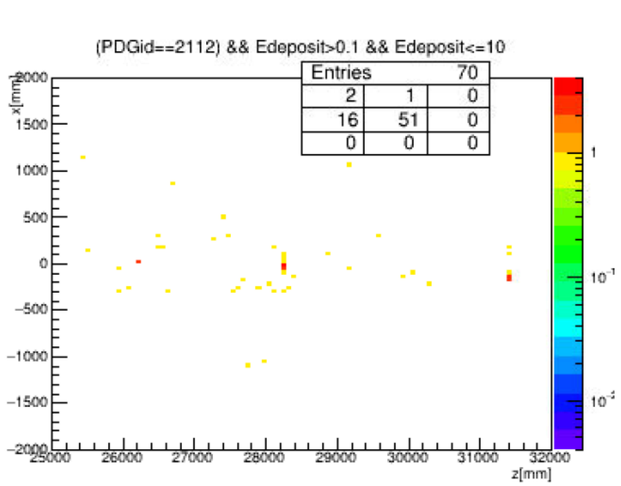
PREX2 - comparison

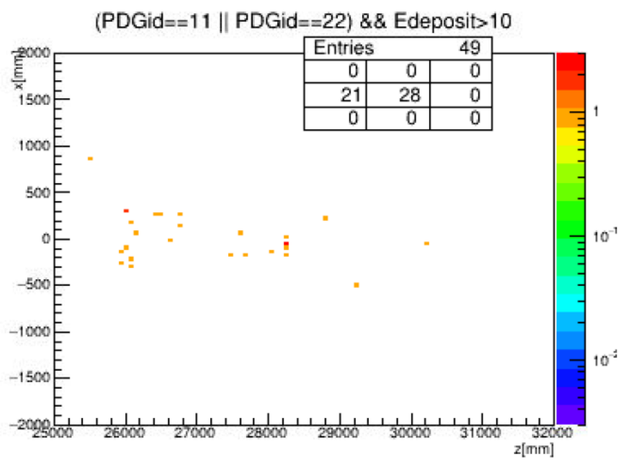
current setup

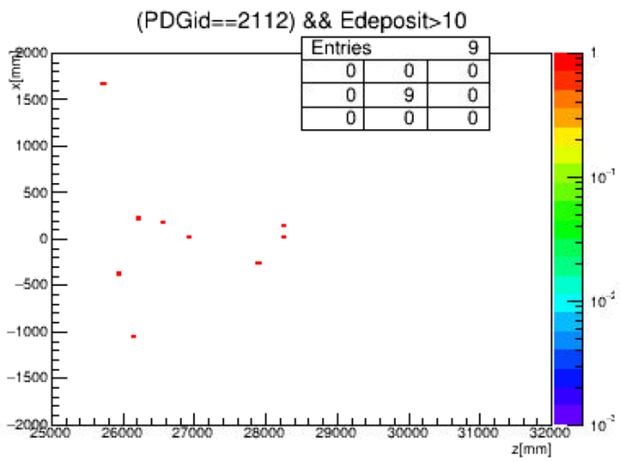




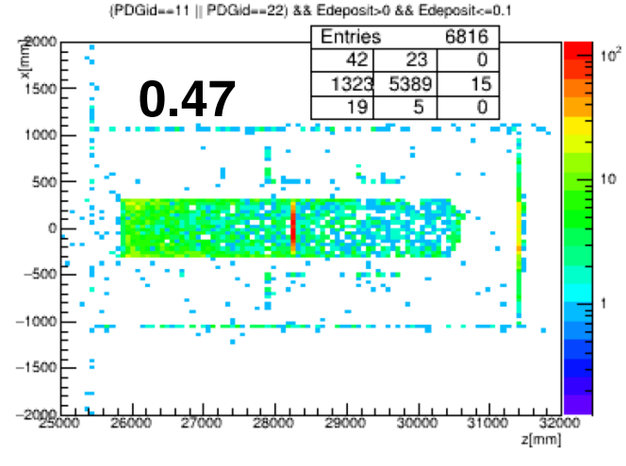


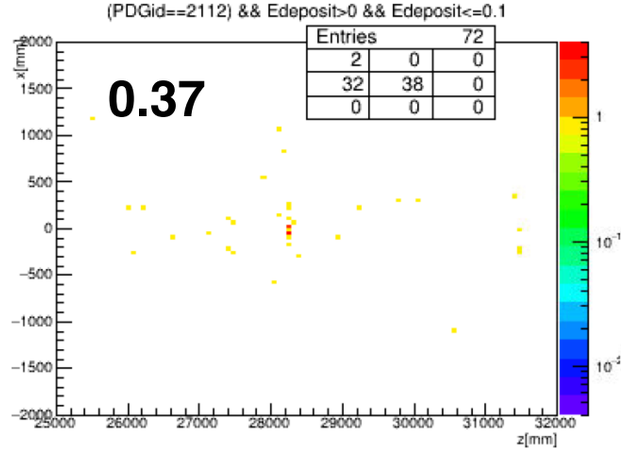


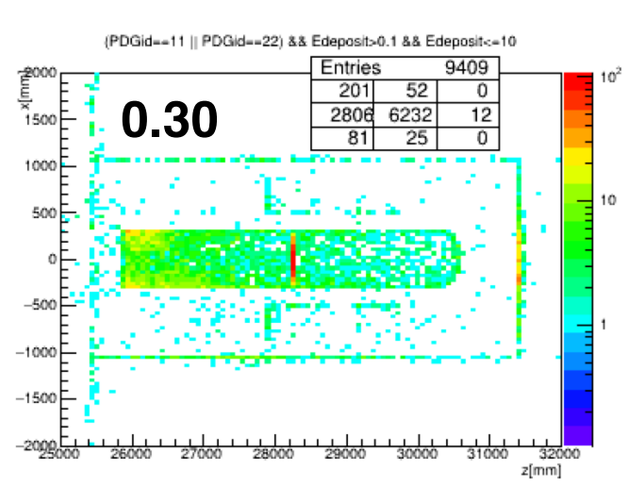


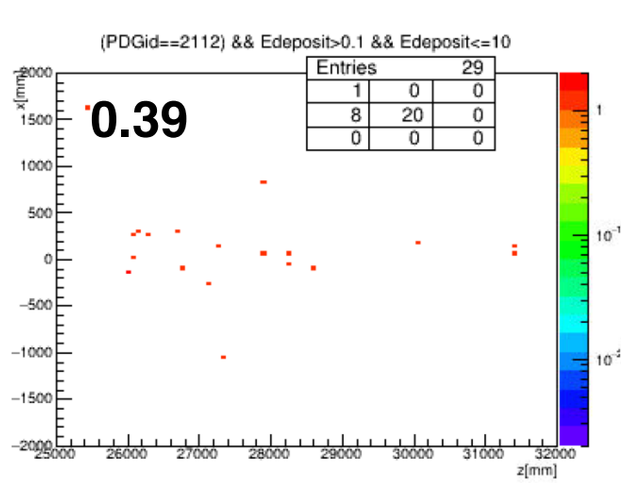


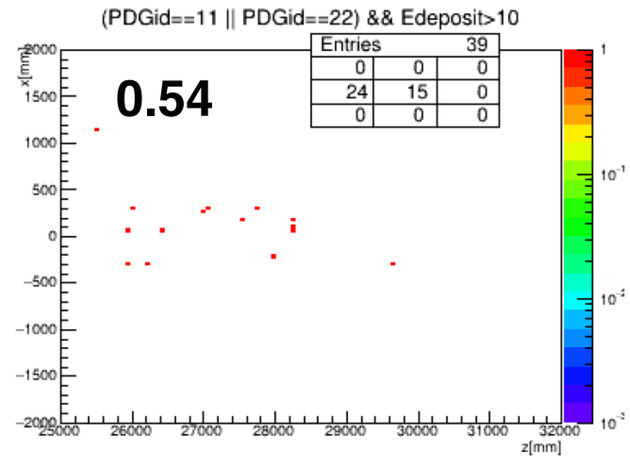
current setup + 1 ft Poly shield

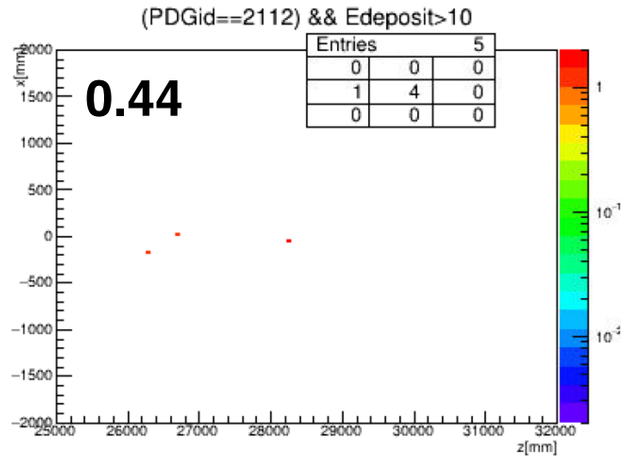






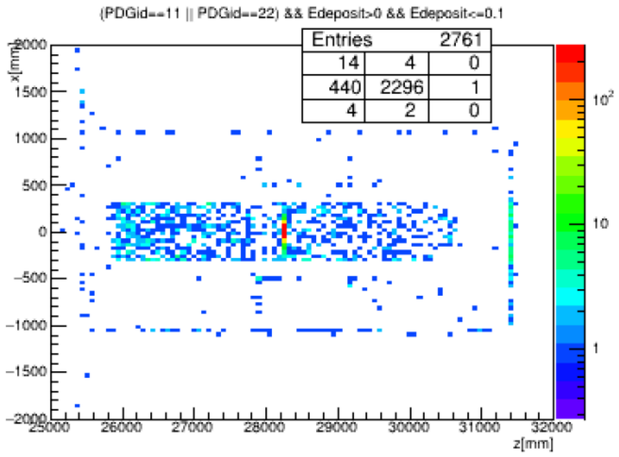


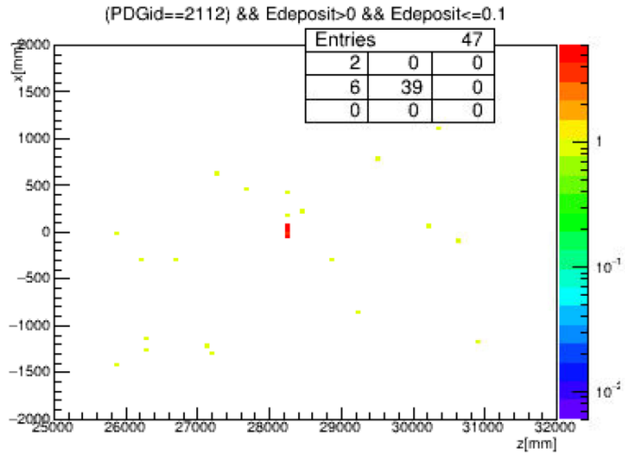


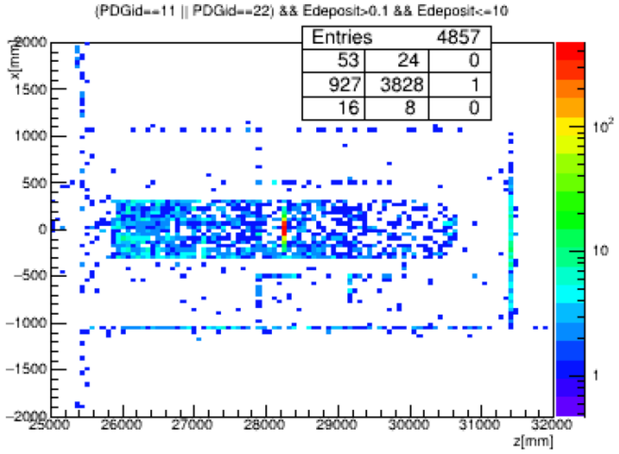


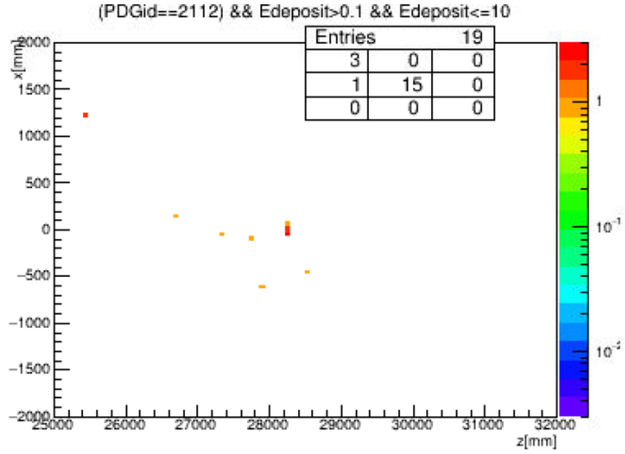
CREX - comparison

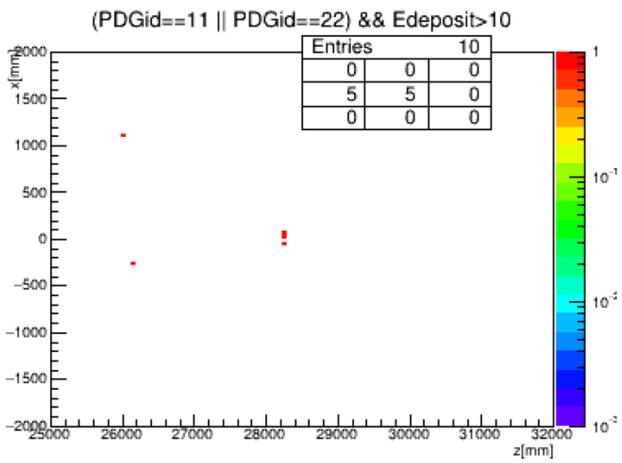
current setup

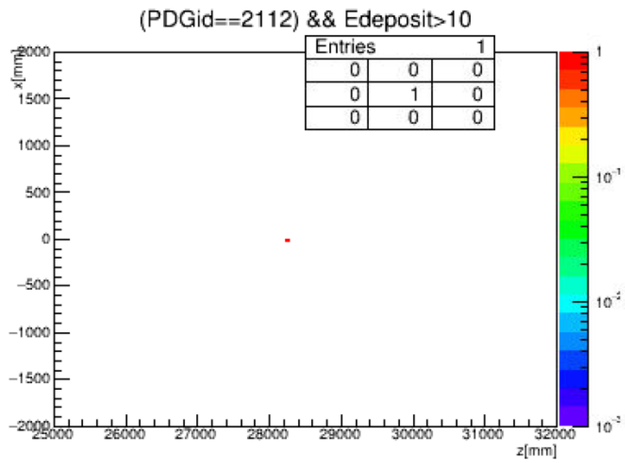




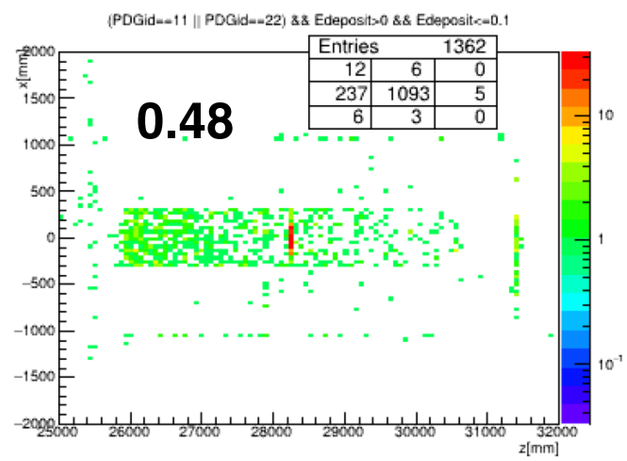


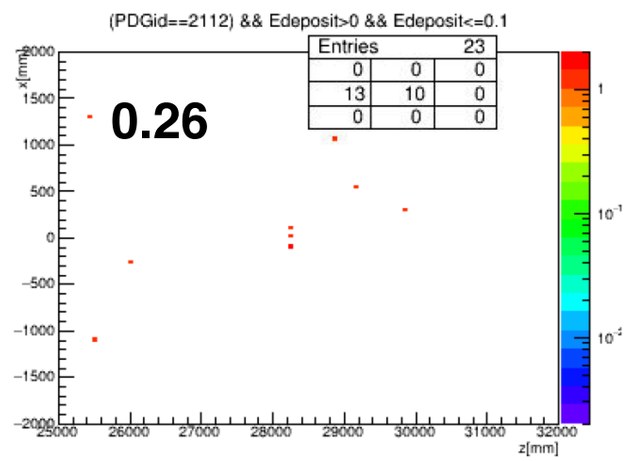


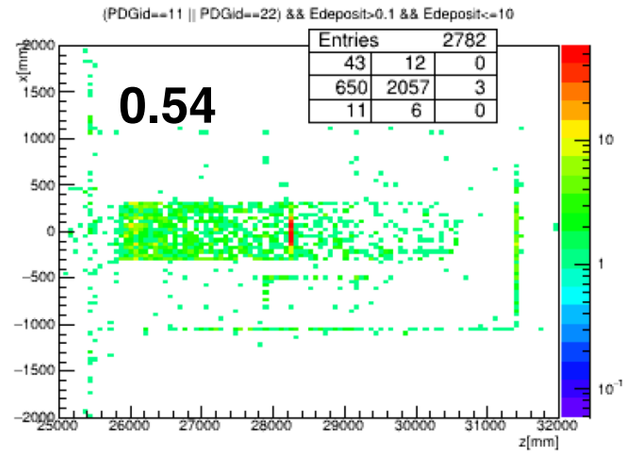


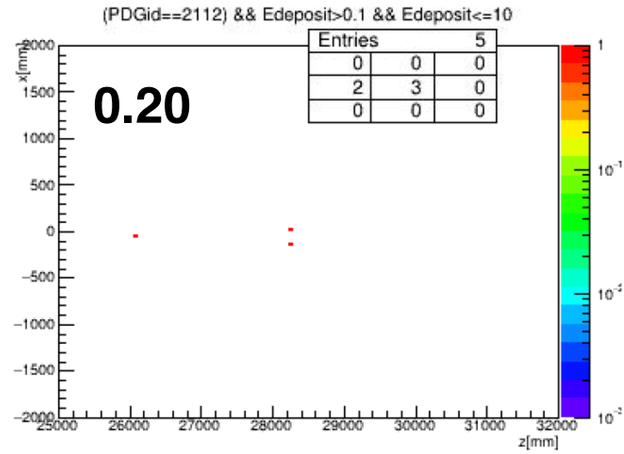


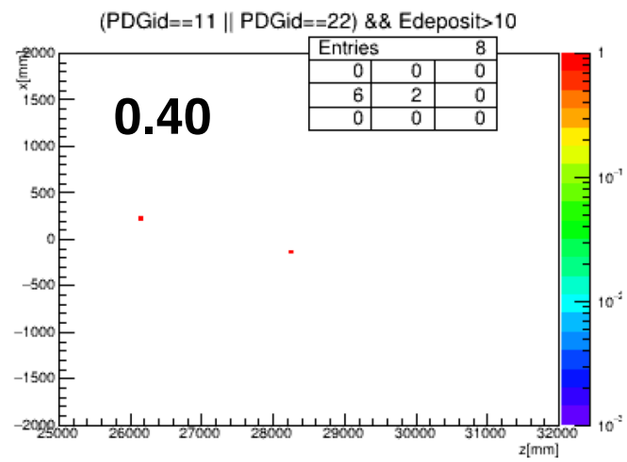
current setup + 4 in donut

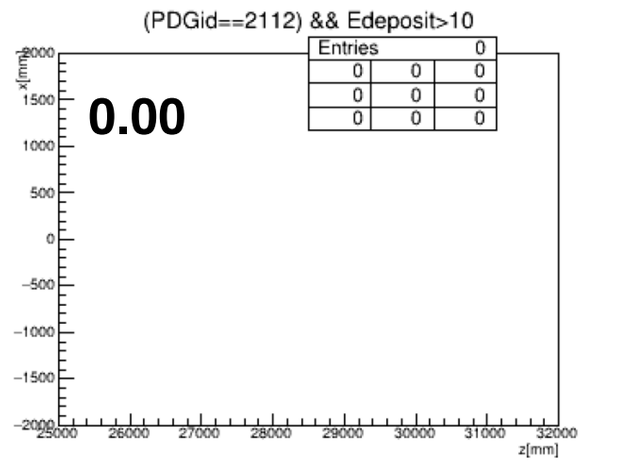






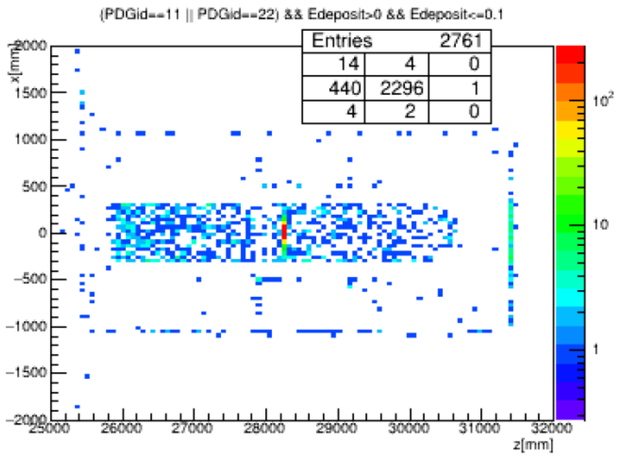


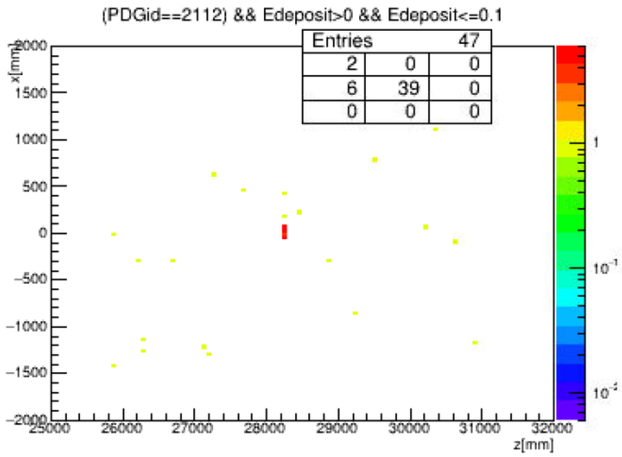


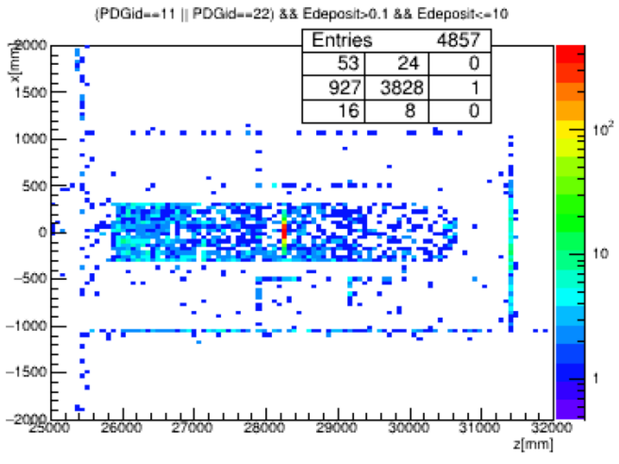


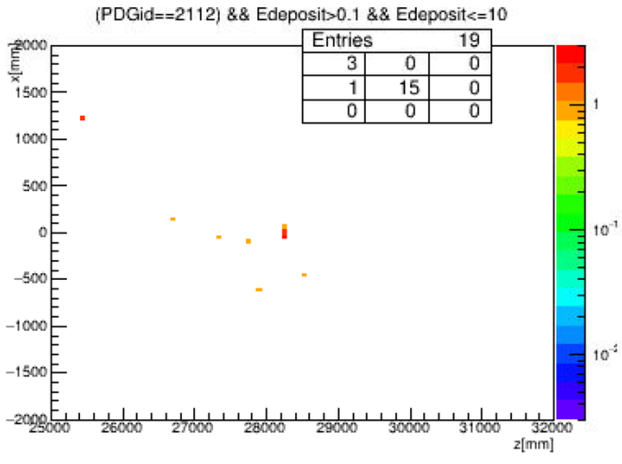
CREX - comparison

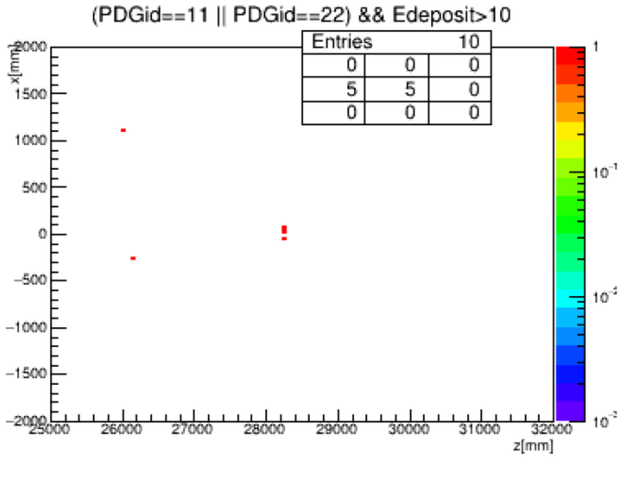
current setup

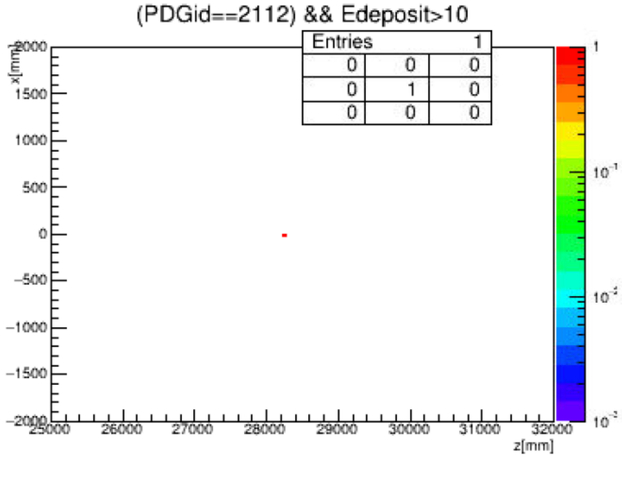




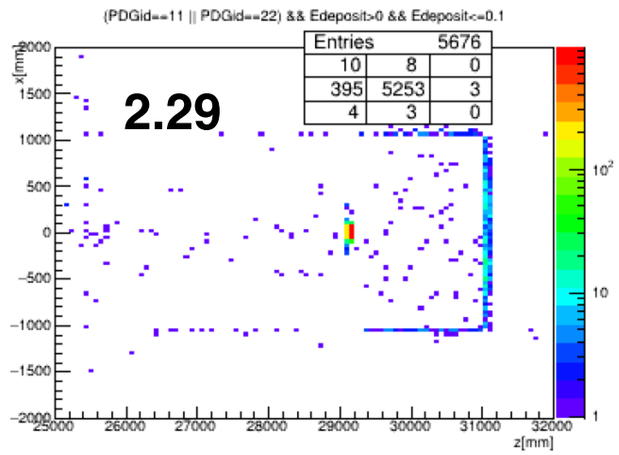


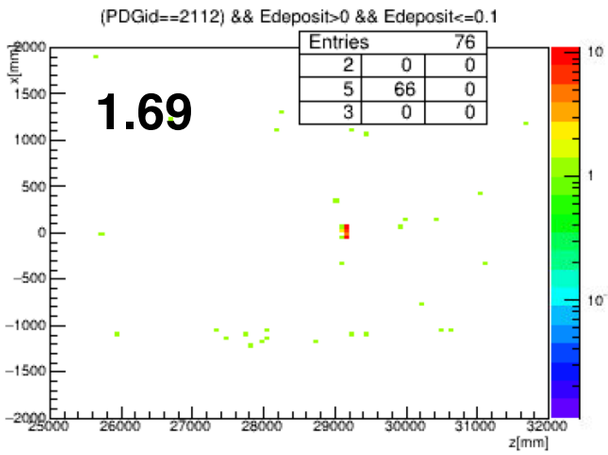


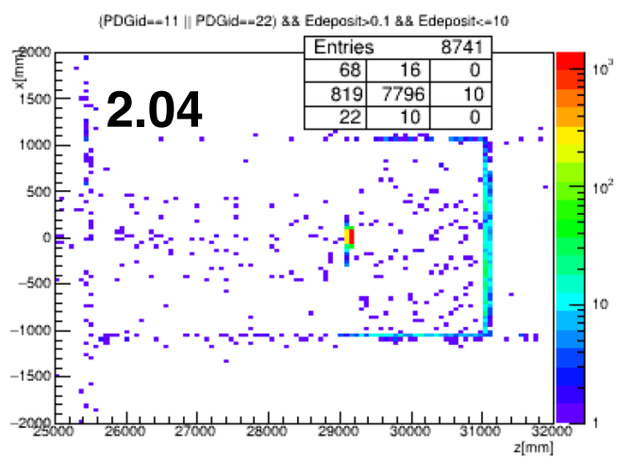


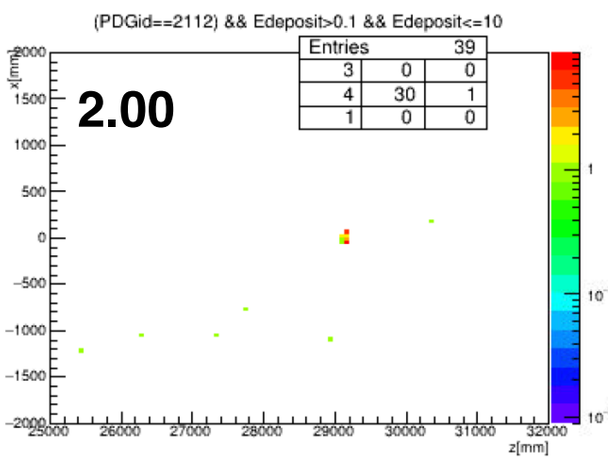


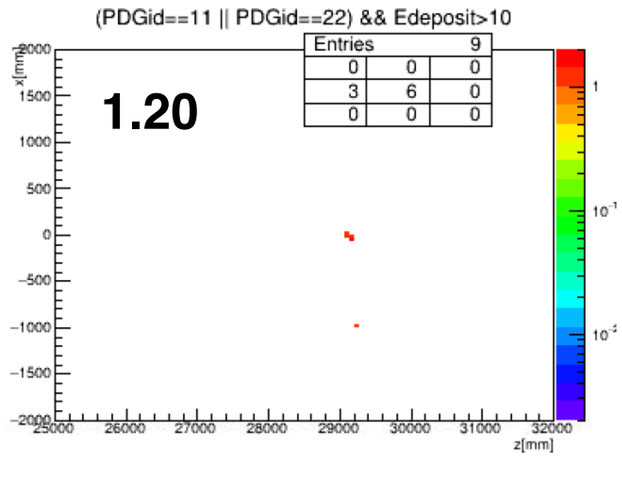
PREX1 dump setup

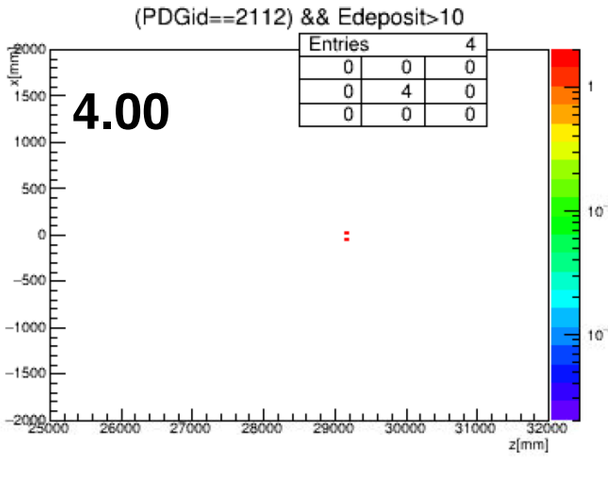






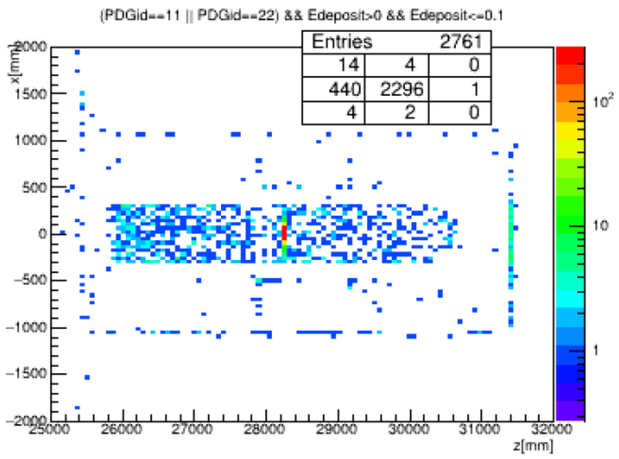


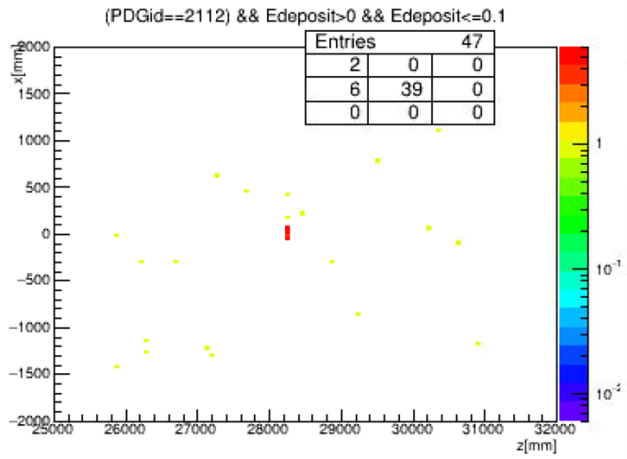


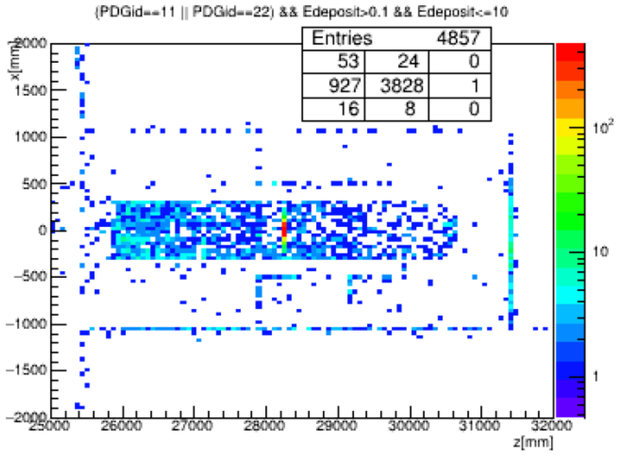


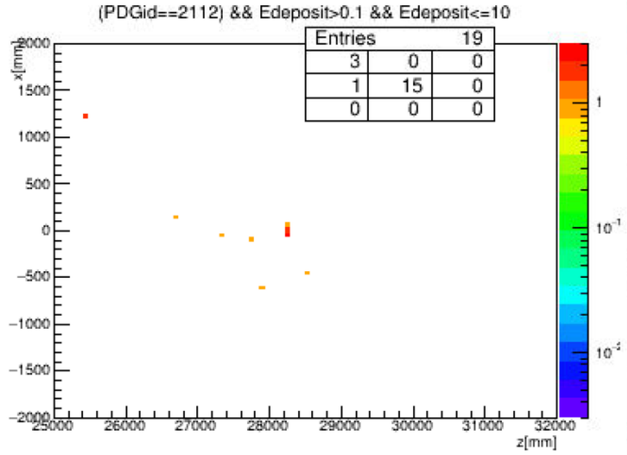
CREX - comparison

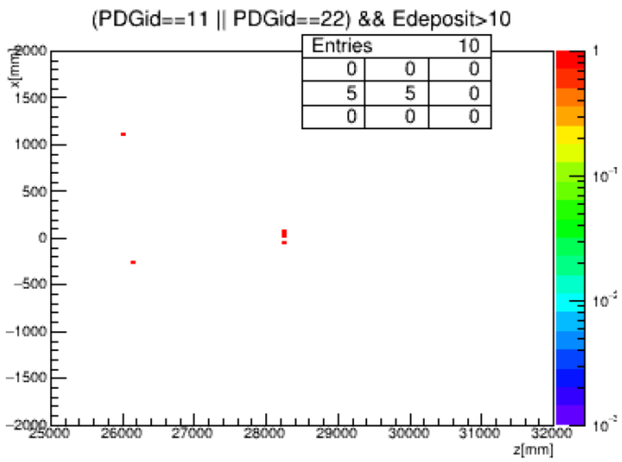
current setup

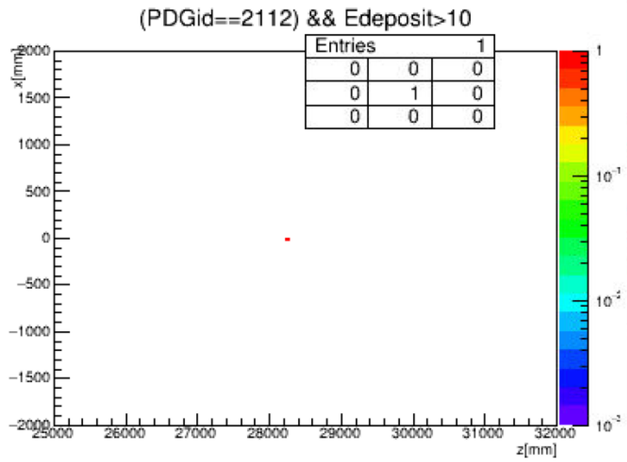




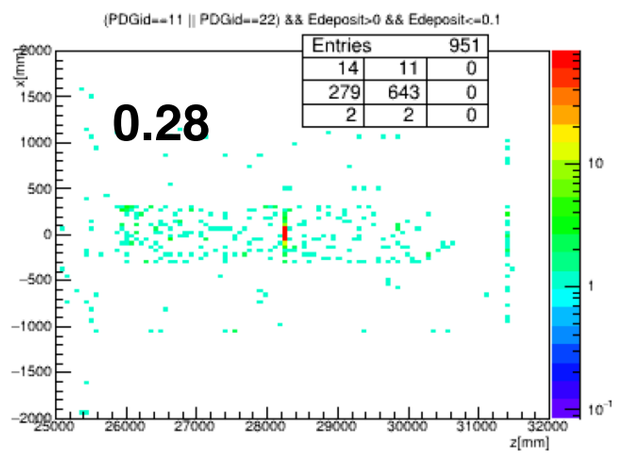


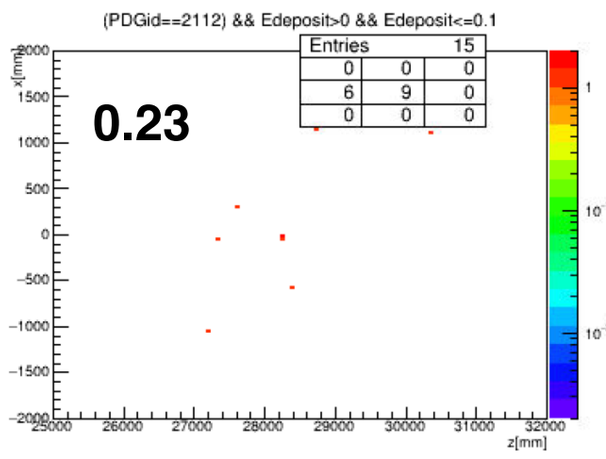


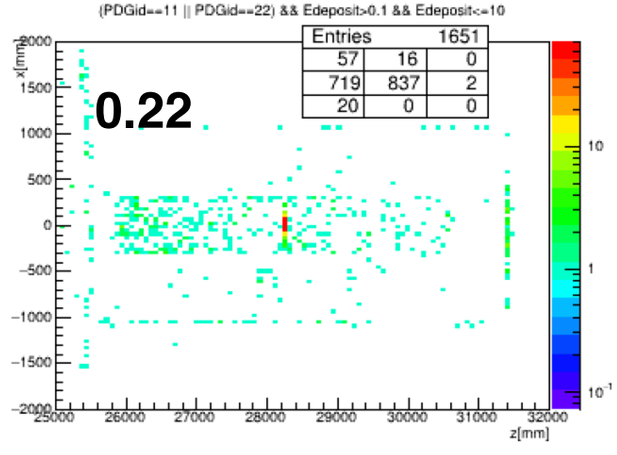


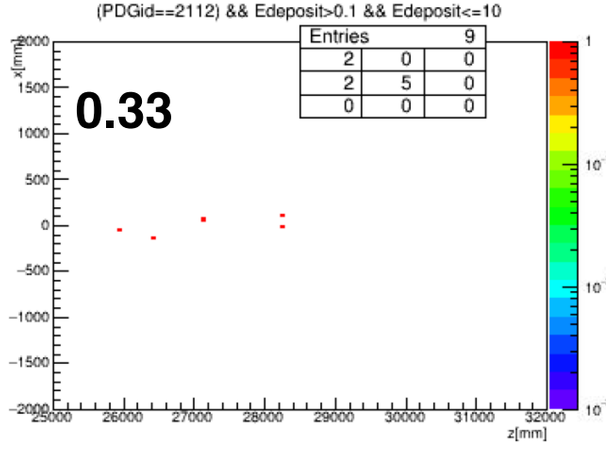


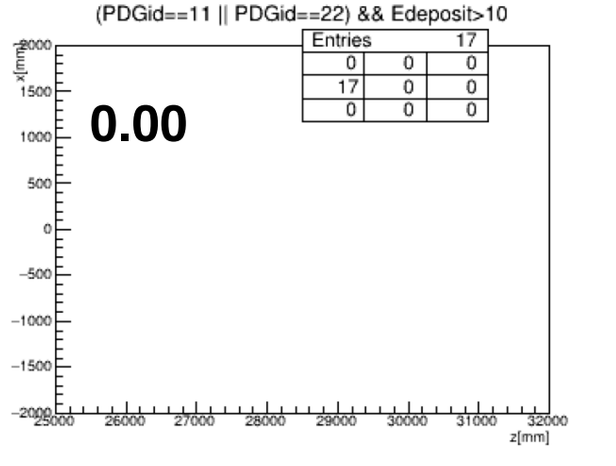
current setup + 1 ft concrete shield

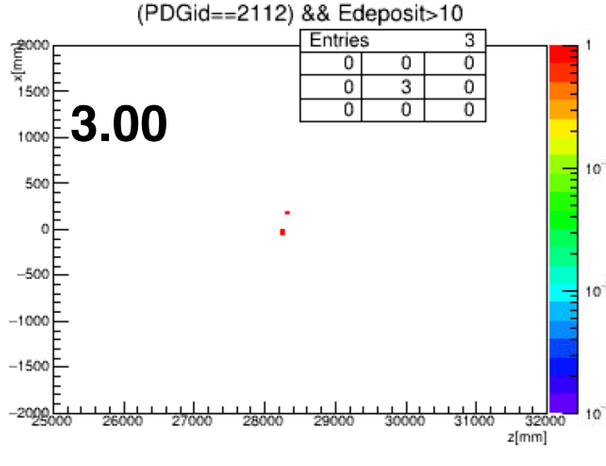






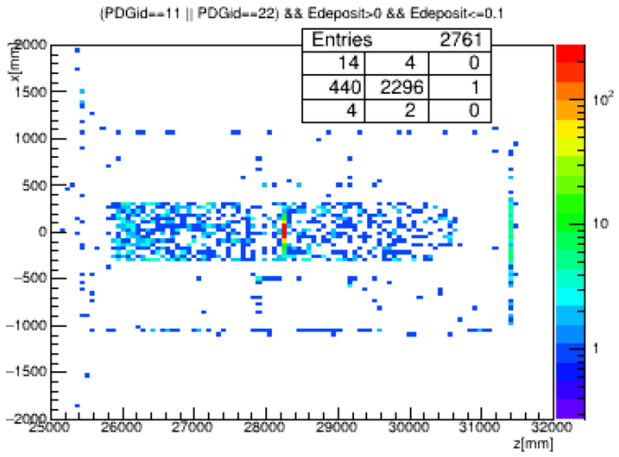


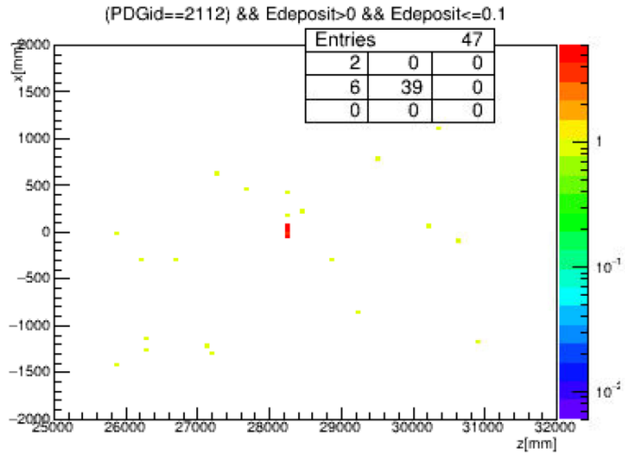


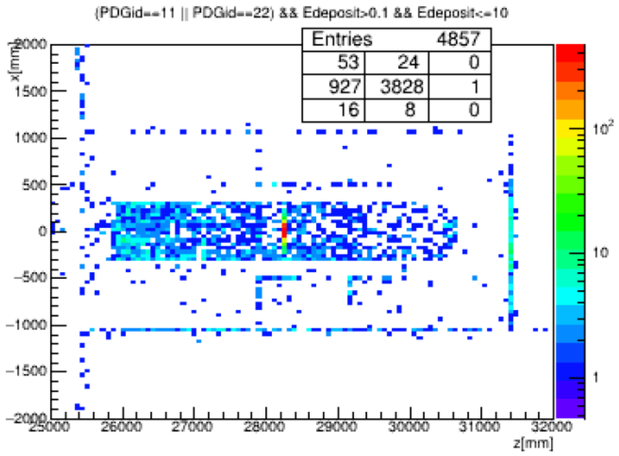


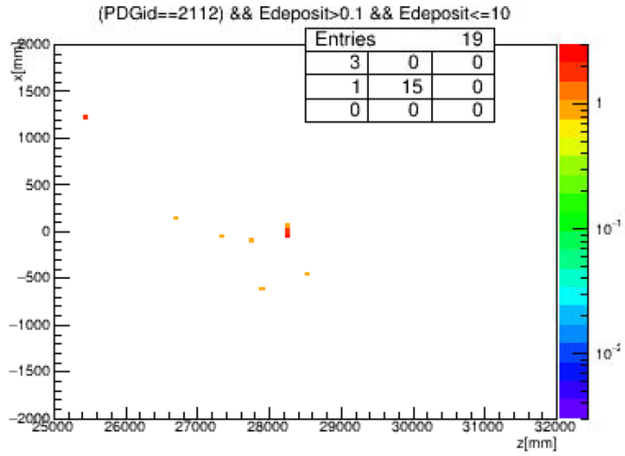
CREX - comparison

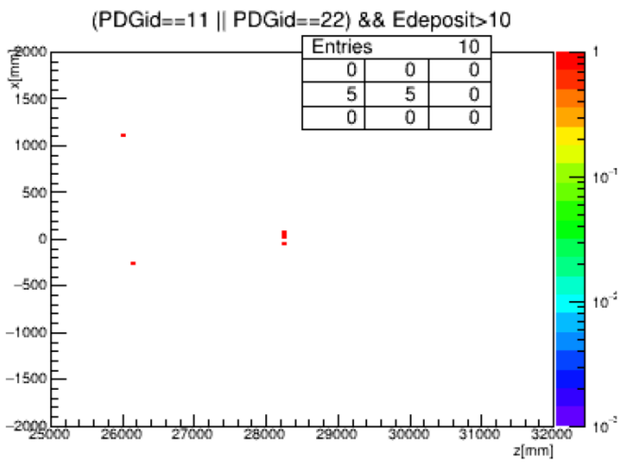
current setup

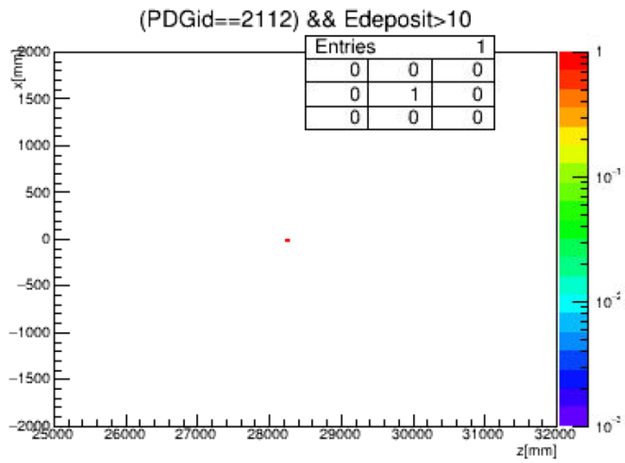












current setup + 1 ft Poly shield