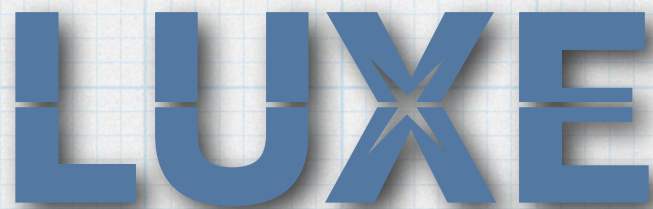


Signal and background in Gamma monitor

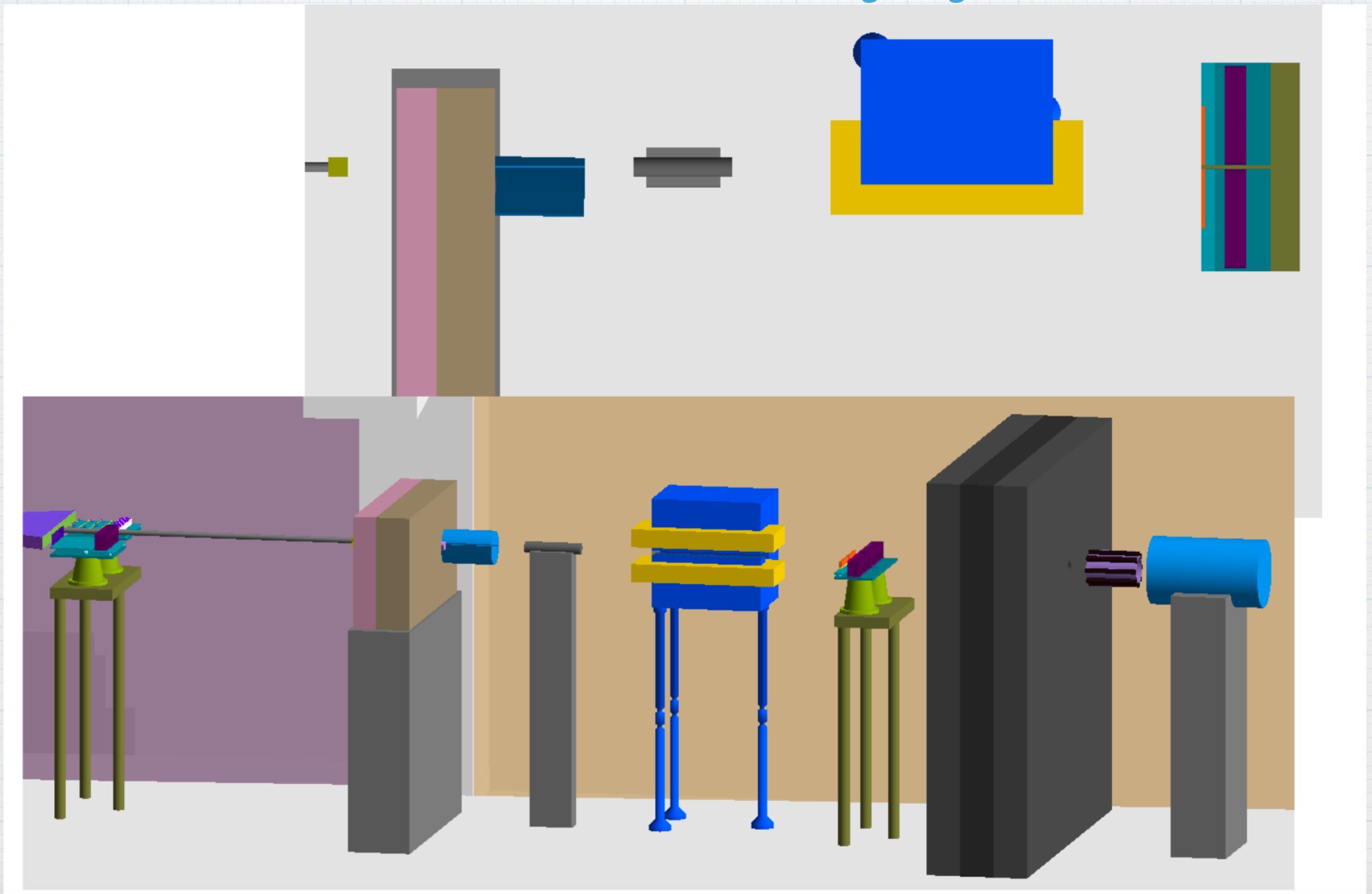
Borysova Maryna

27/10/20

LUXE analysis meeting

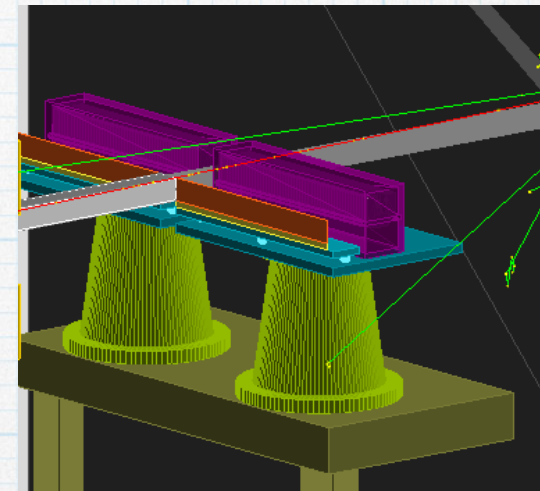
The logo for the LUXE experiment, featuring the word "LUXE" in a bold, blue, sans-serif font. The letter "X" is stylized with a grey, multi-pointed star or cross shape in the center, creating a focal point.

Forward detector system w/o beam pipe

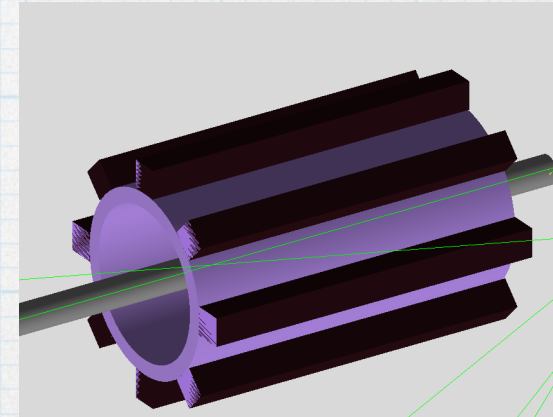


JETI40, 16.5 GeV, 50 μm

- the technologies:
conversion detector (Lanex screens)

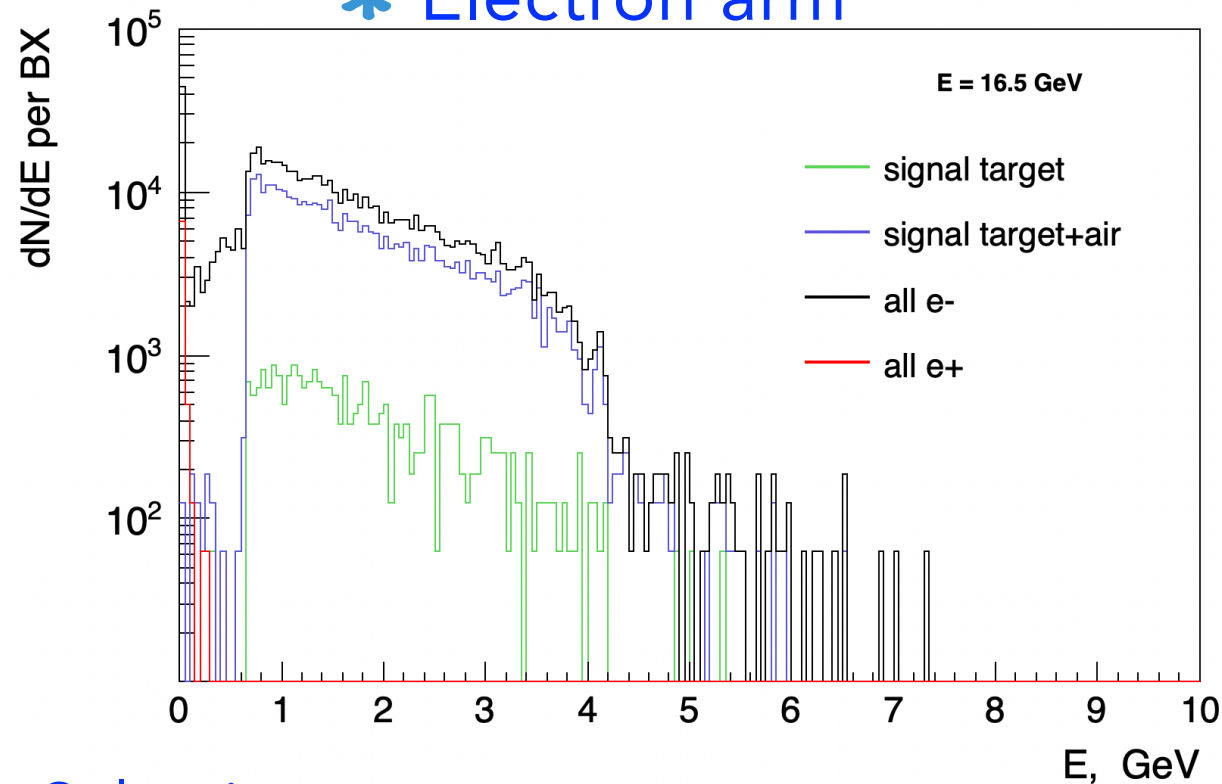


backscattering calorimeter



Lanex screens, Spectra

* Electron arm



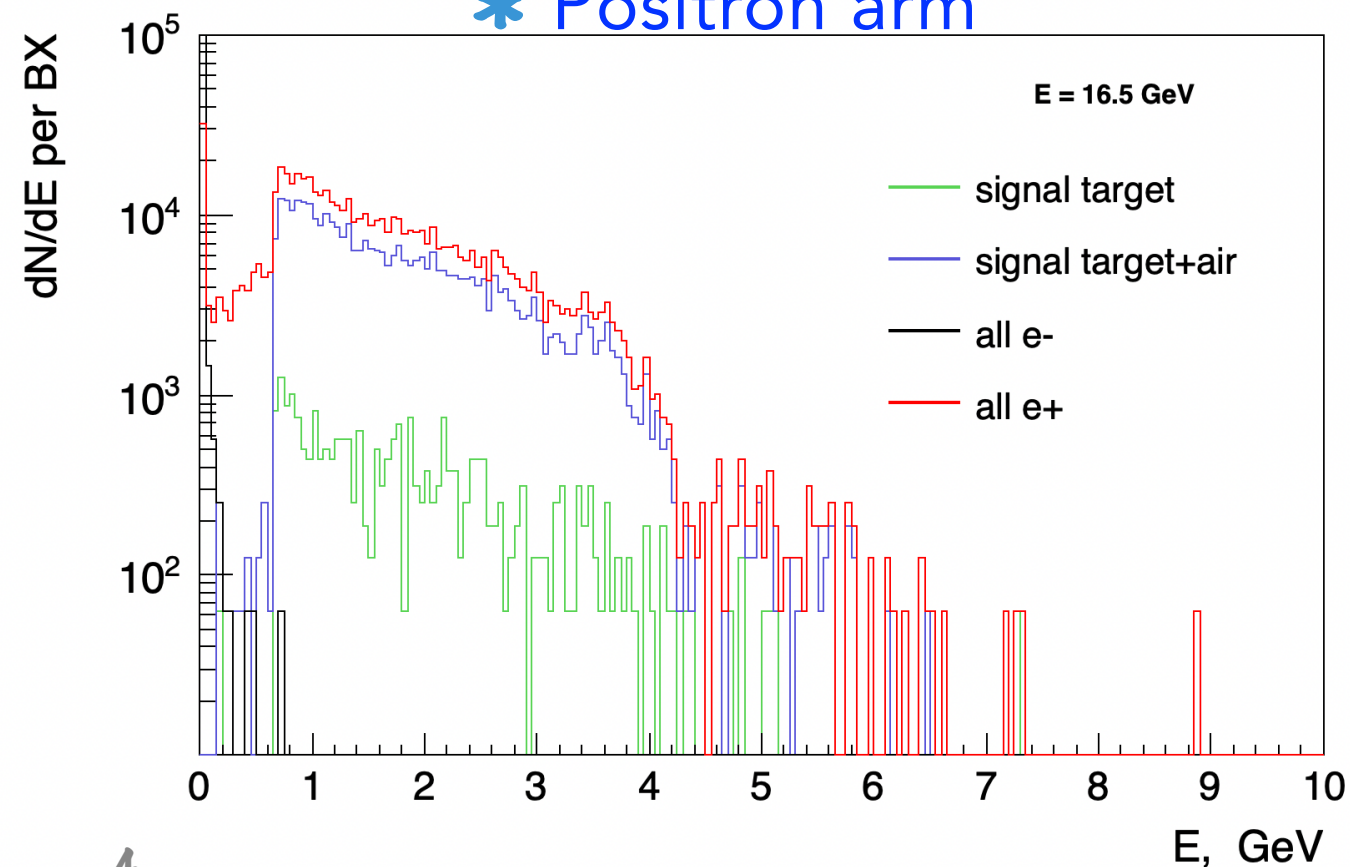
JETI40, 16.5 GeV, 50 μm

- Electrons/positrons generated in target by primary photon and which are hitting Lanex screens
- Consider air before the magnet as a target too

* Selection

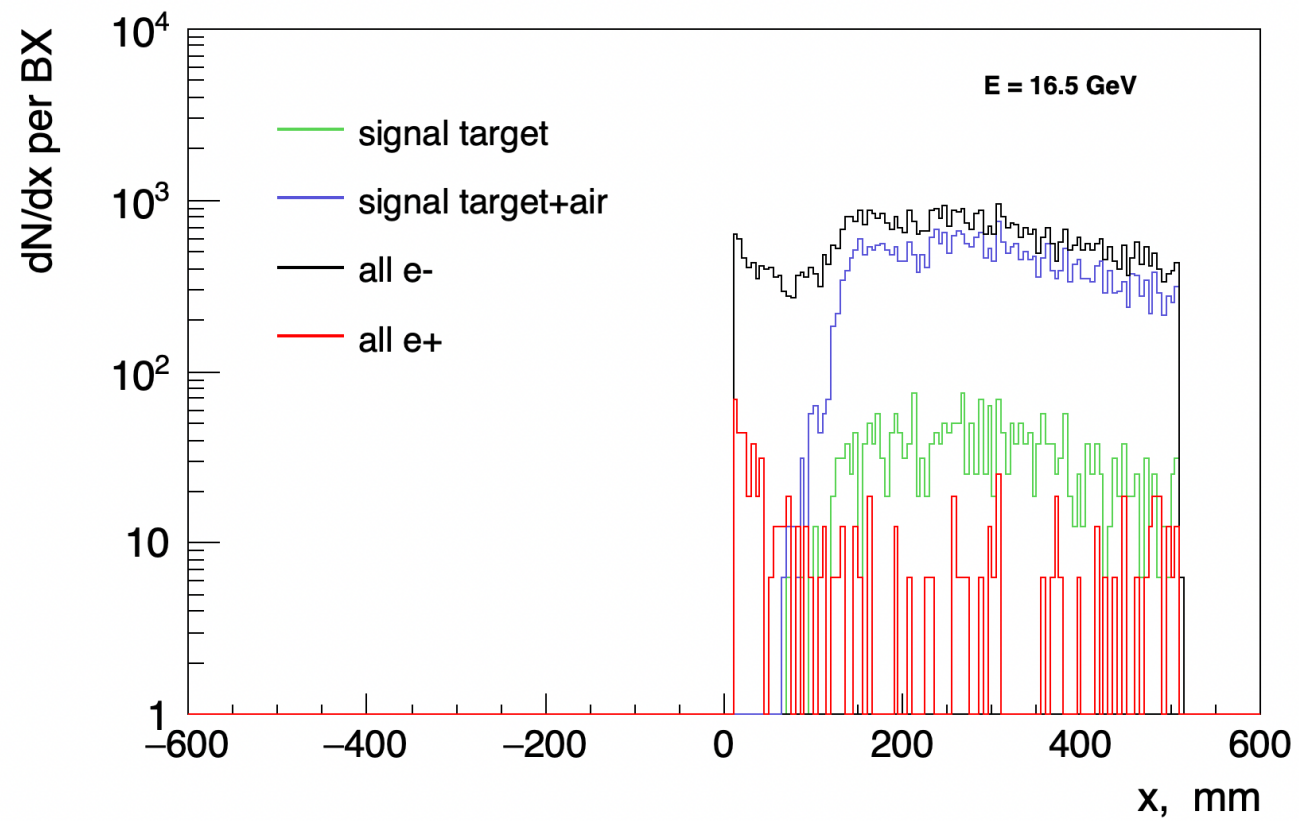
- detid == 3000/3001
- pdg == 11/-11
- Parent pdg == 22
- Parent == primary
- Primary pdg == 22
- $|\text{vtx } x, y| < 25 \text{ mm}$
- $|\text{vtx } z - 6.5 \text{ m}| < 100 \mu\text{m}$
- $\text{vtx } z > 6.5 \text{ m} - 100 \mu\text{m} \ \&\& \ \text{vtx } z < 9 \text{ m}$

* Positron arm

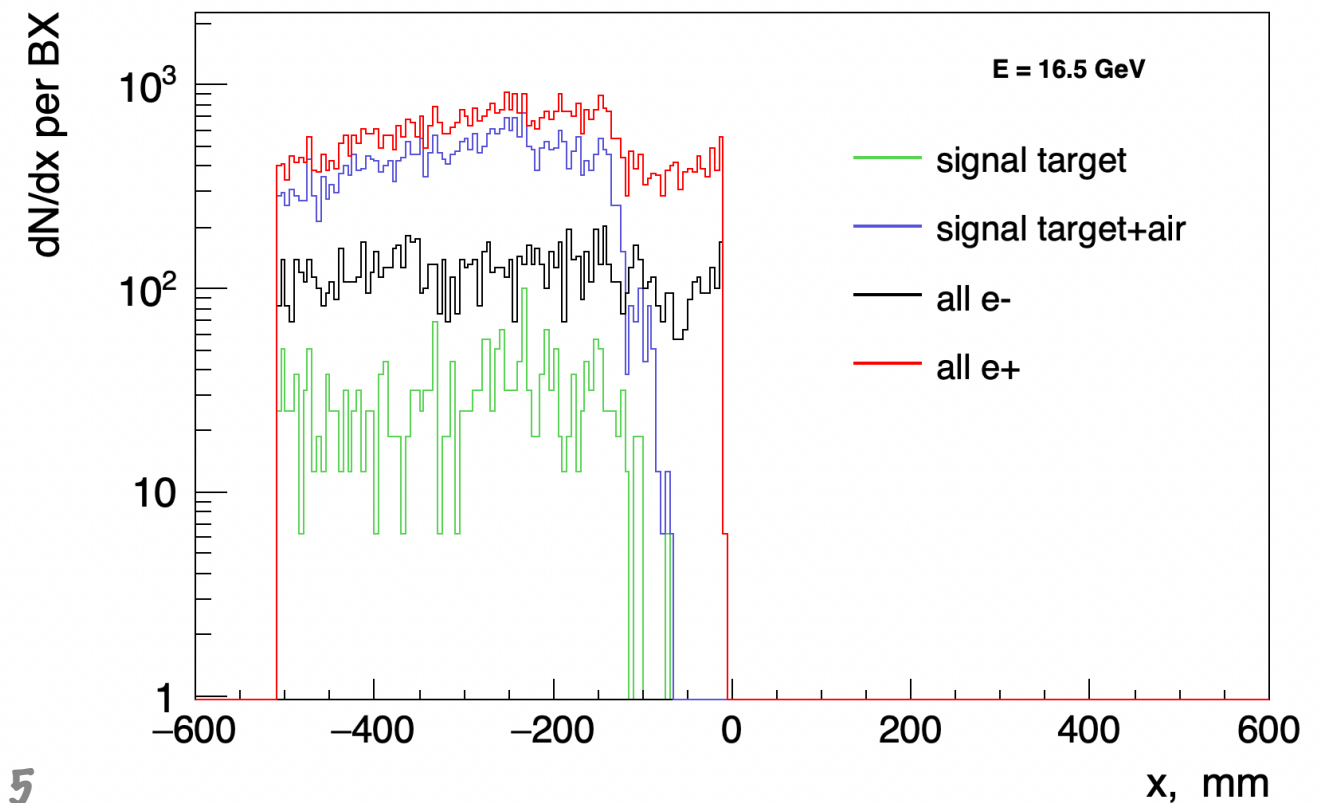


Lanex screens, X-distributions

* Electron arm



* Positron arm

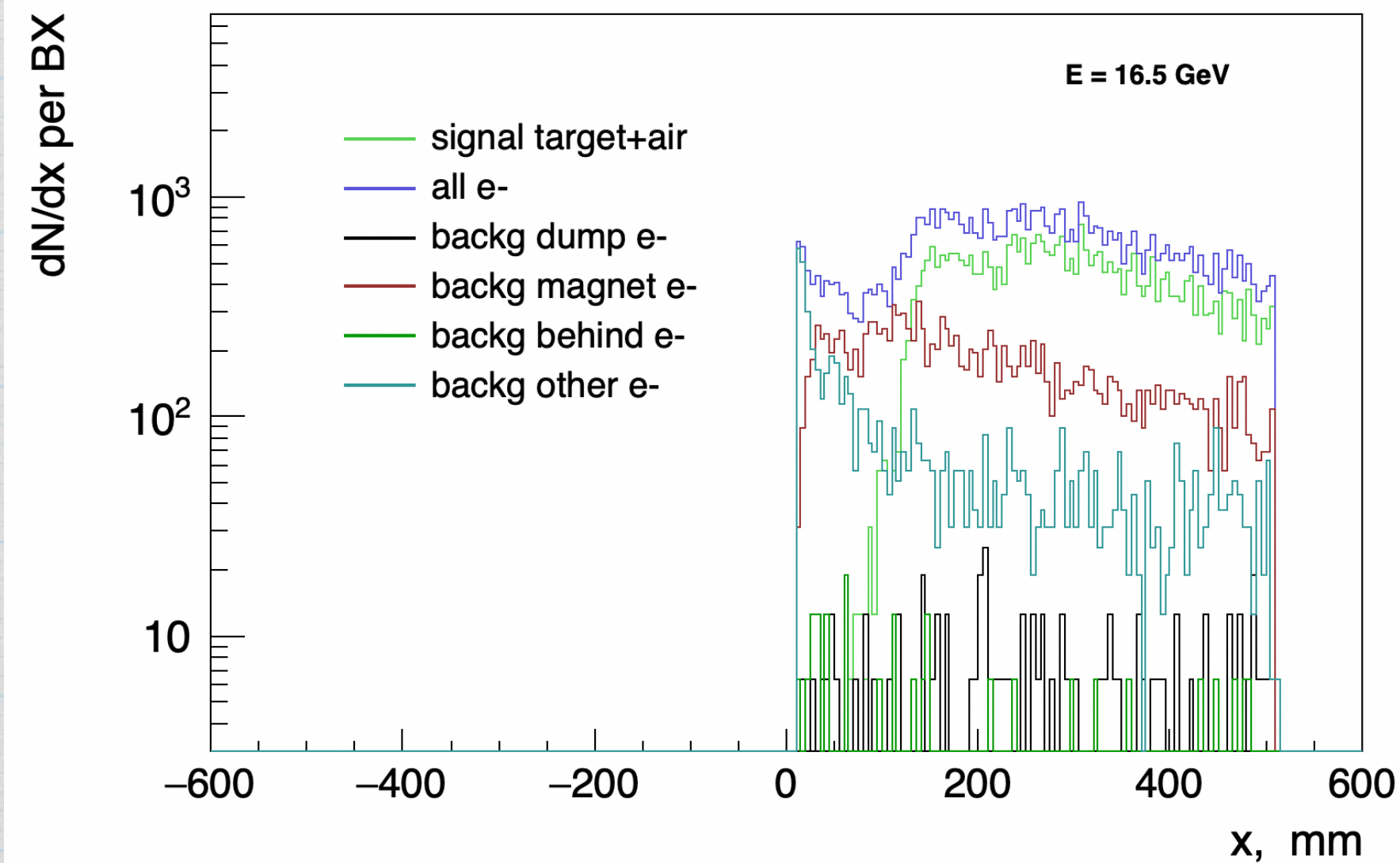
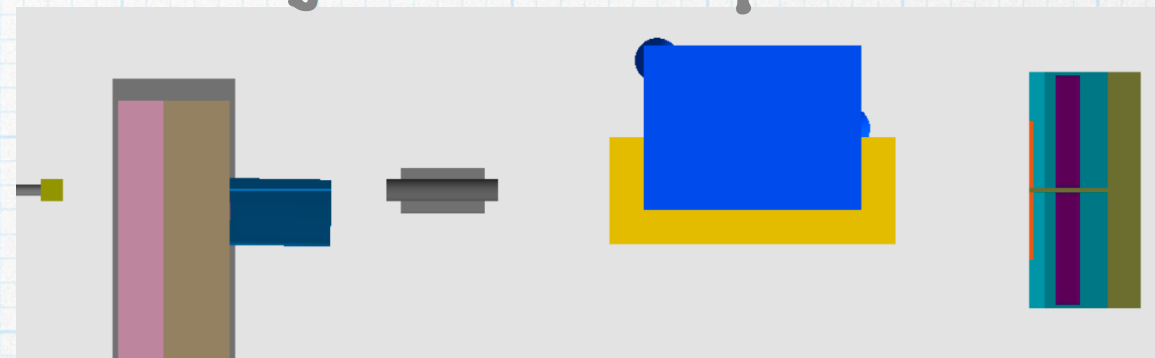


Material	X0,(cm)	Thickness	Fraction X0
Air	3.04E+04	350	1.15 %
Kapton	28.57	2.00E-02	0.07 %

* Electron arm

Lanex screens, X-distributions

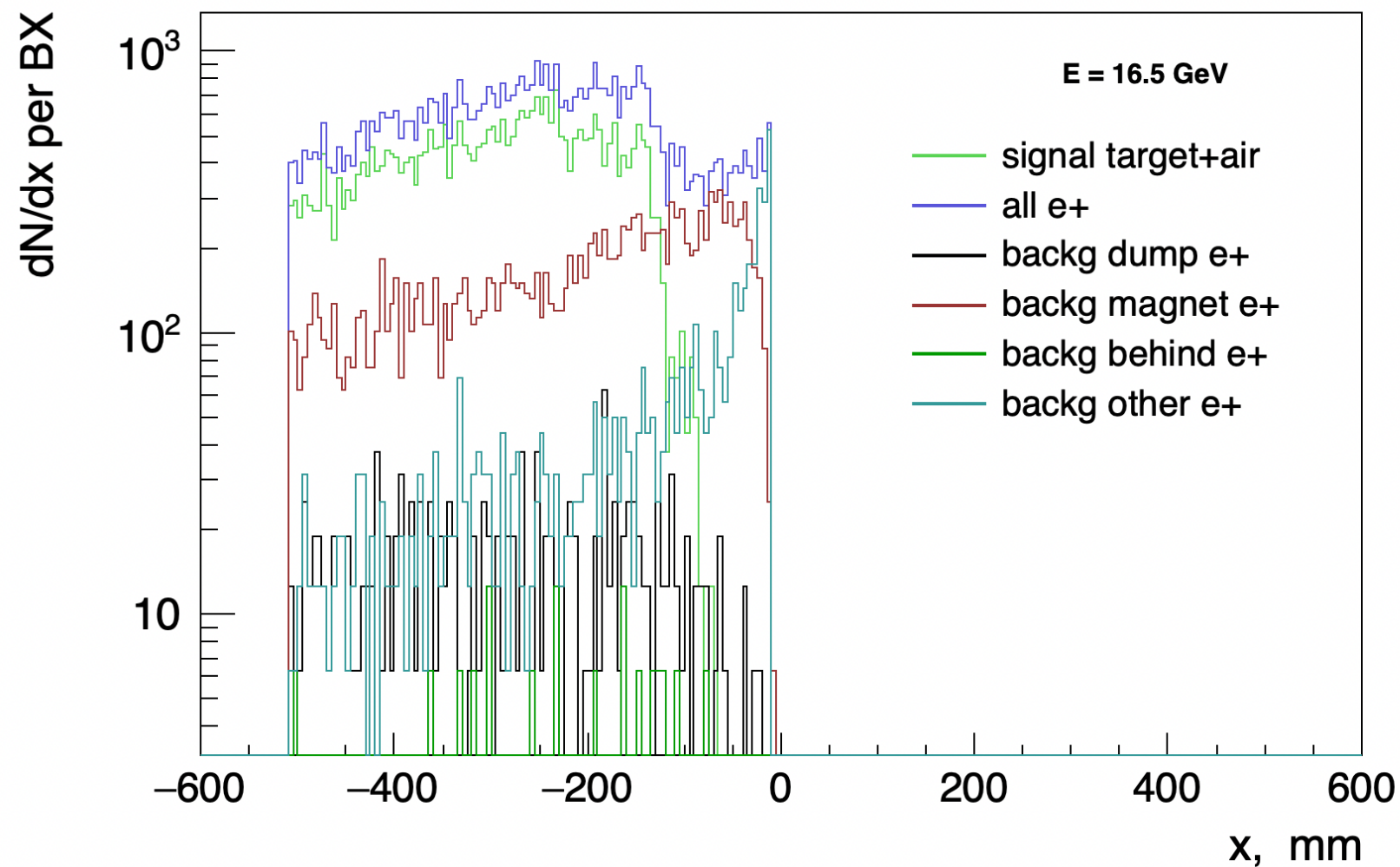
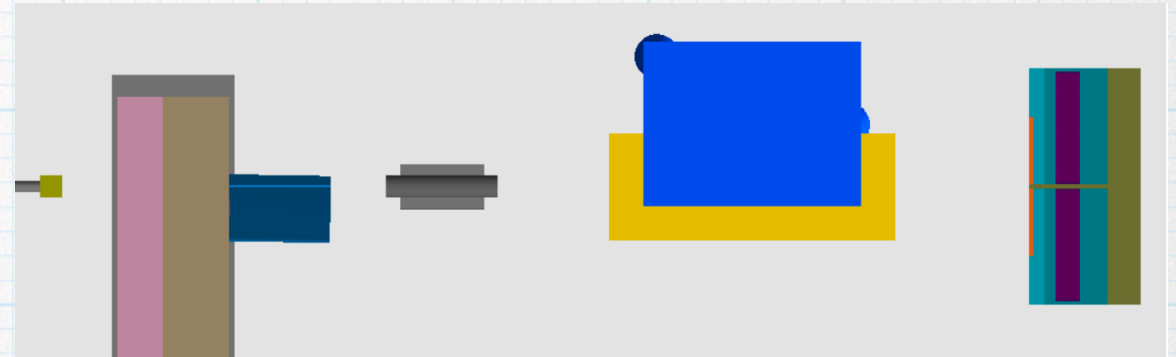
Background components



Lanex screens, X-distributions

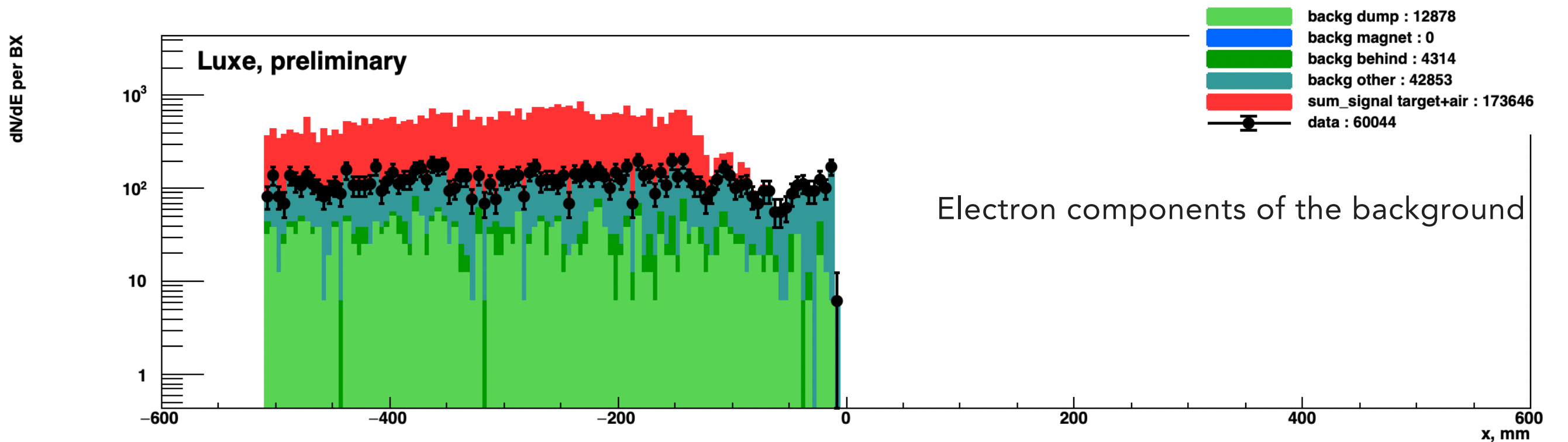
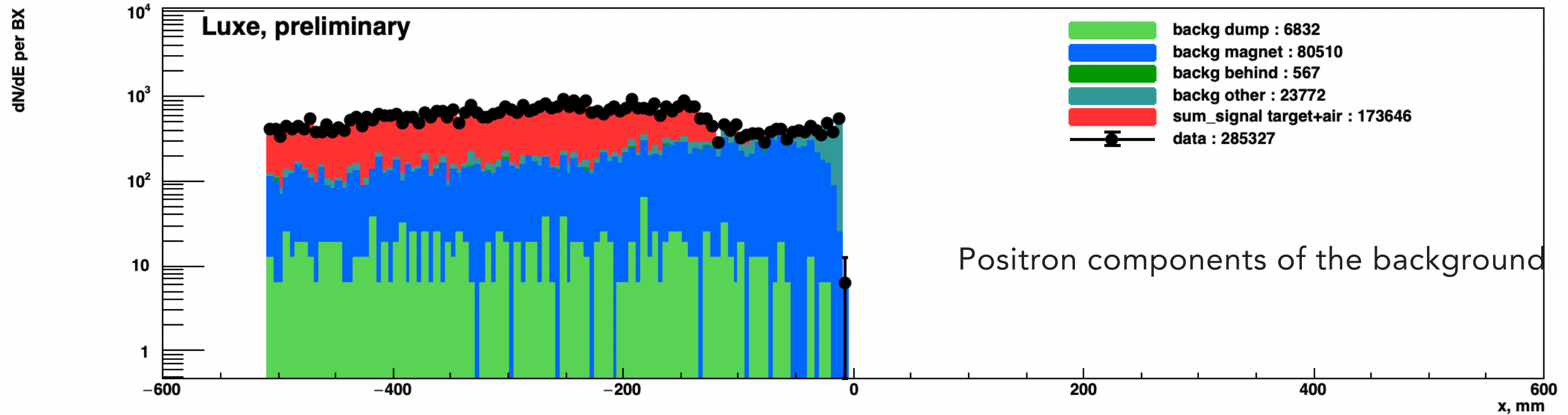
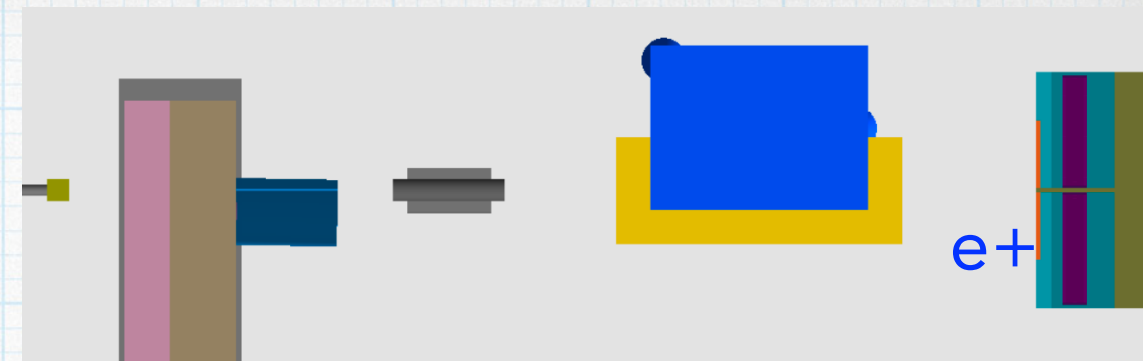
* Positron arm

Background components



Background

* Positron arm

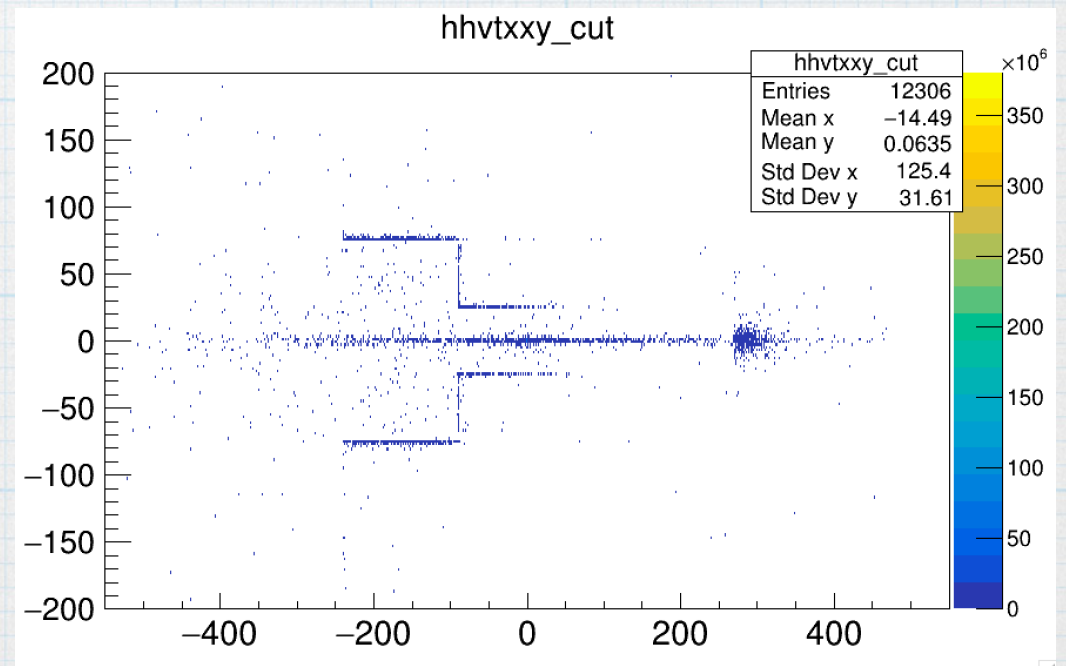
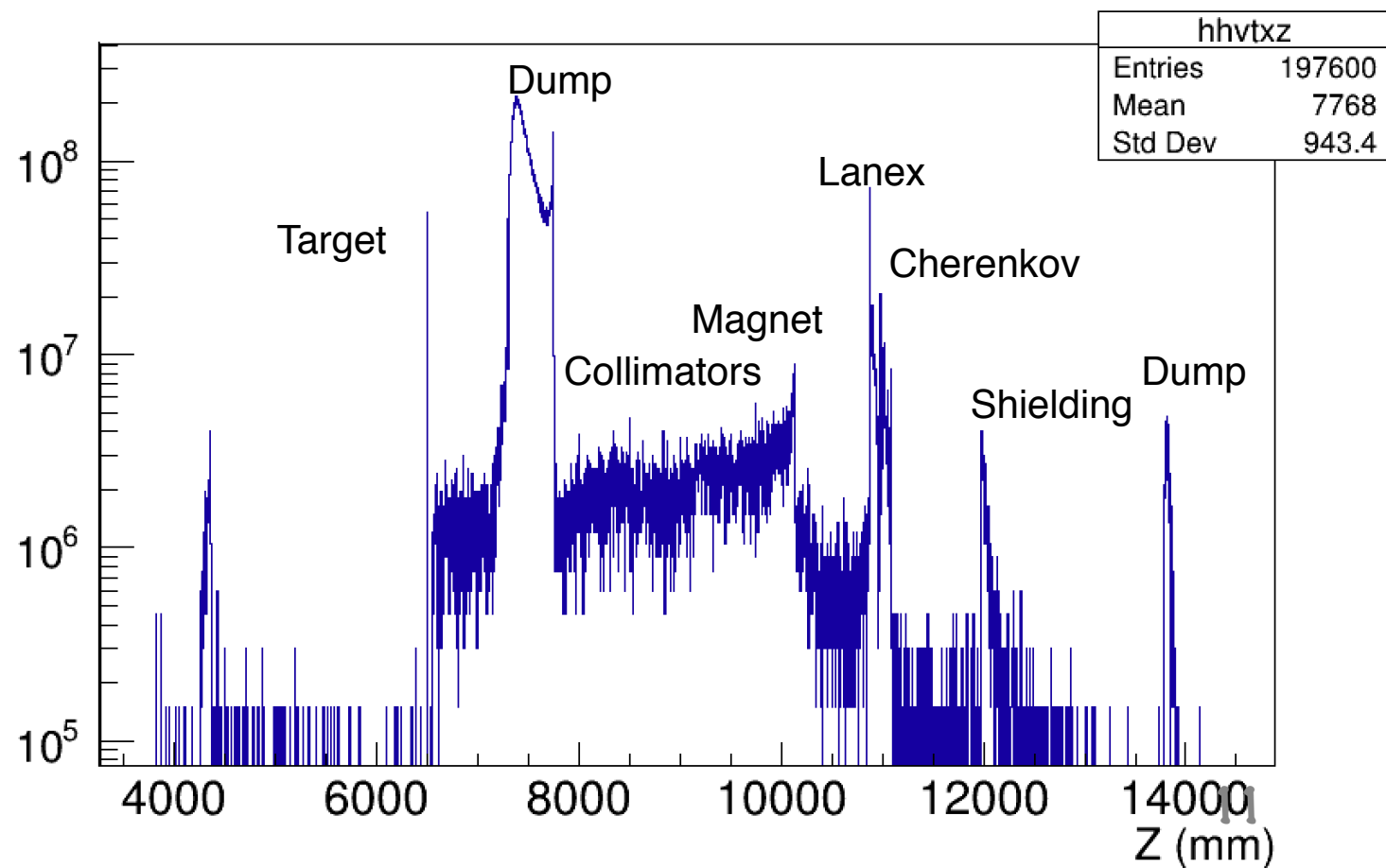
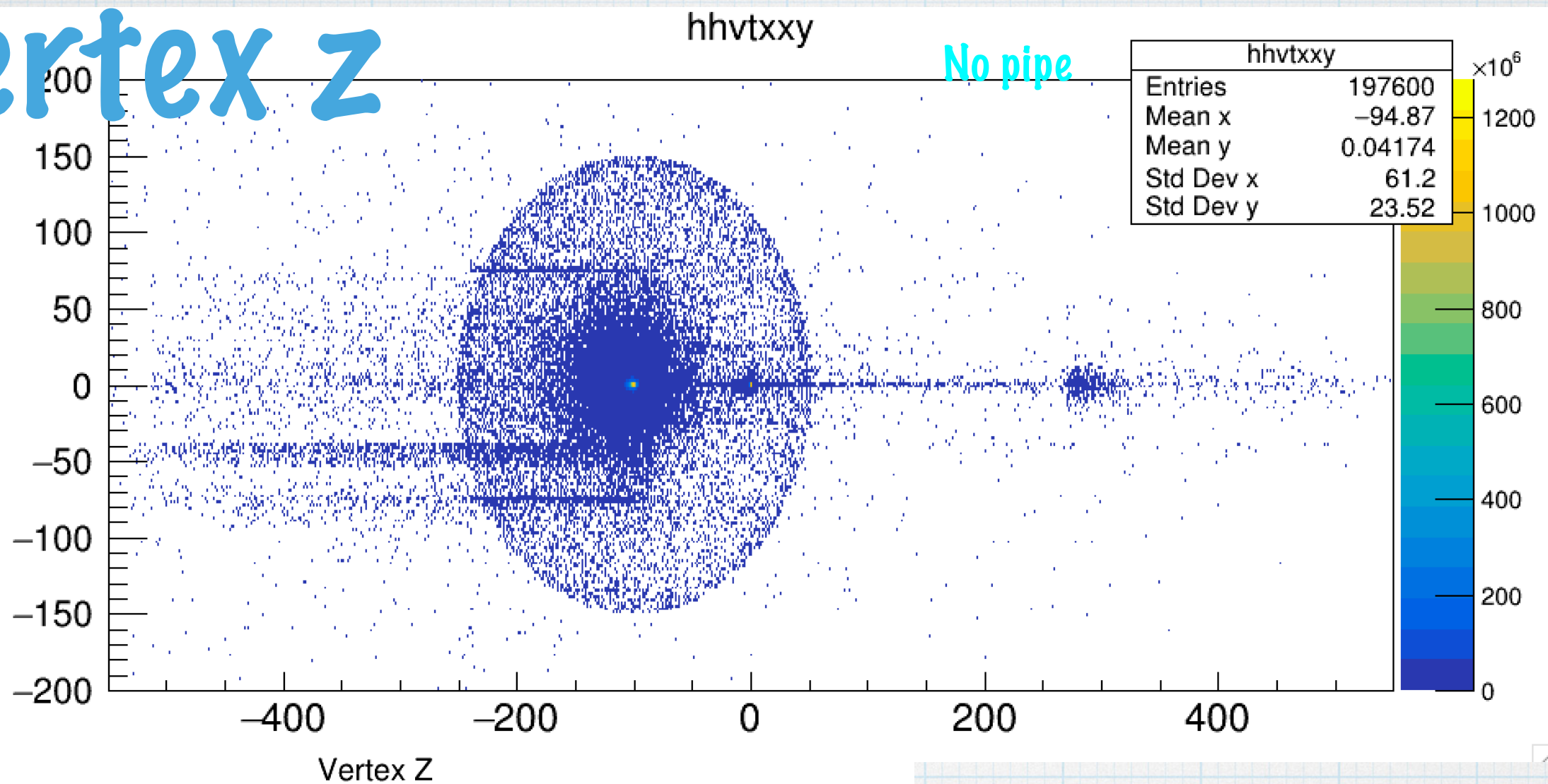


Summary

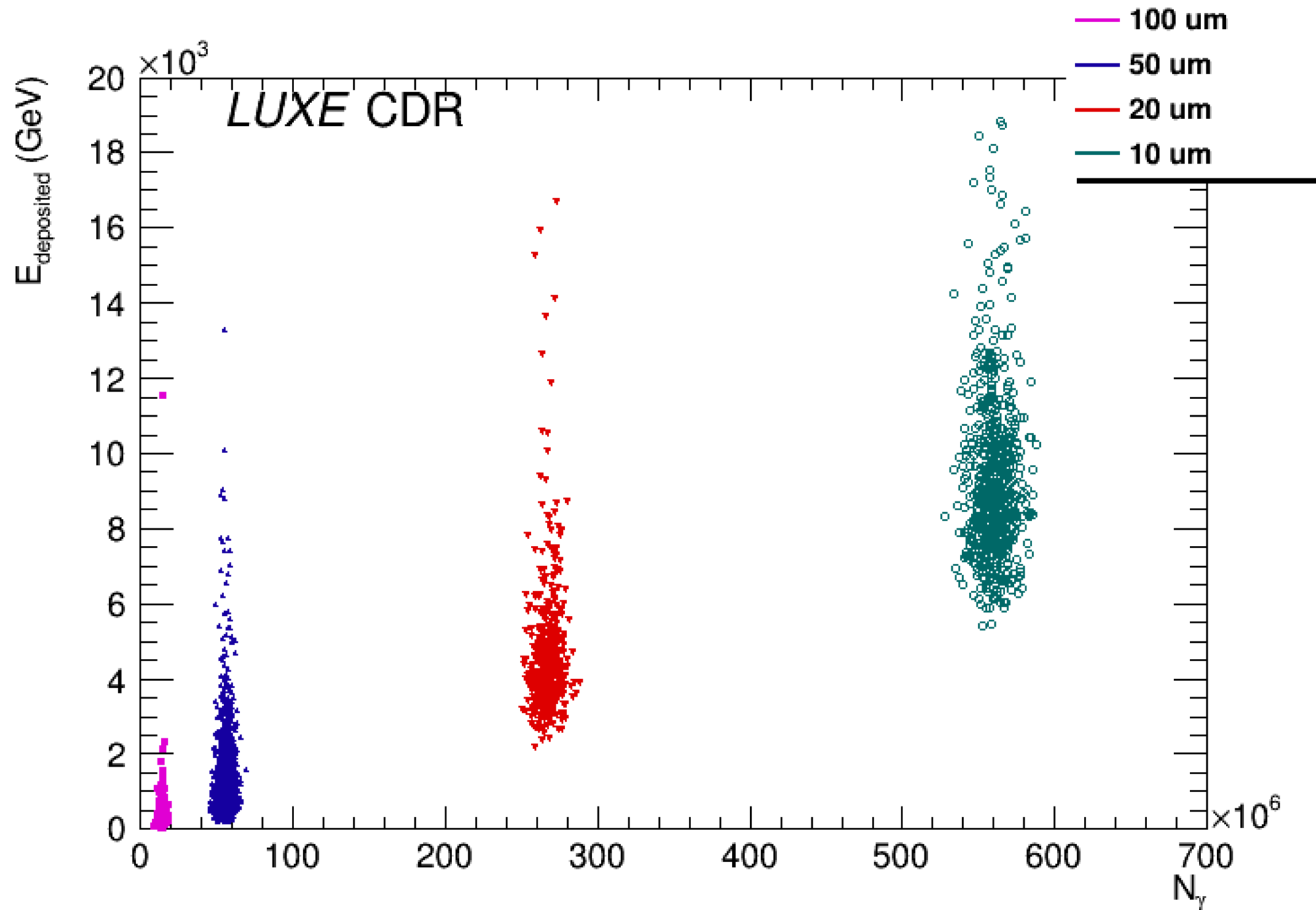
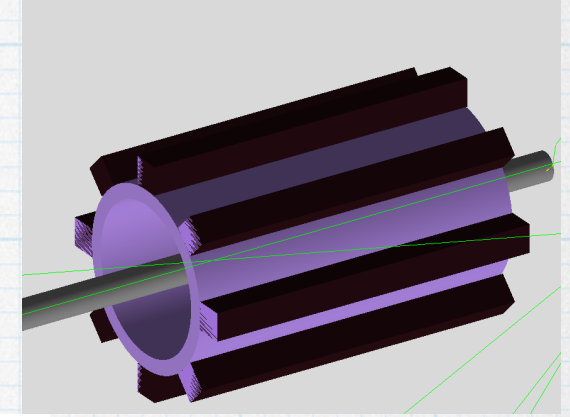
- * First glance at the backgrounds for GM and Lanex screens

Back up

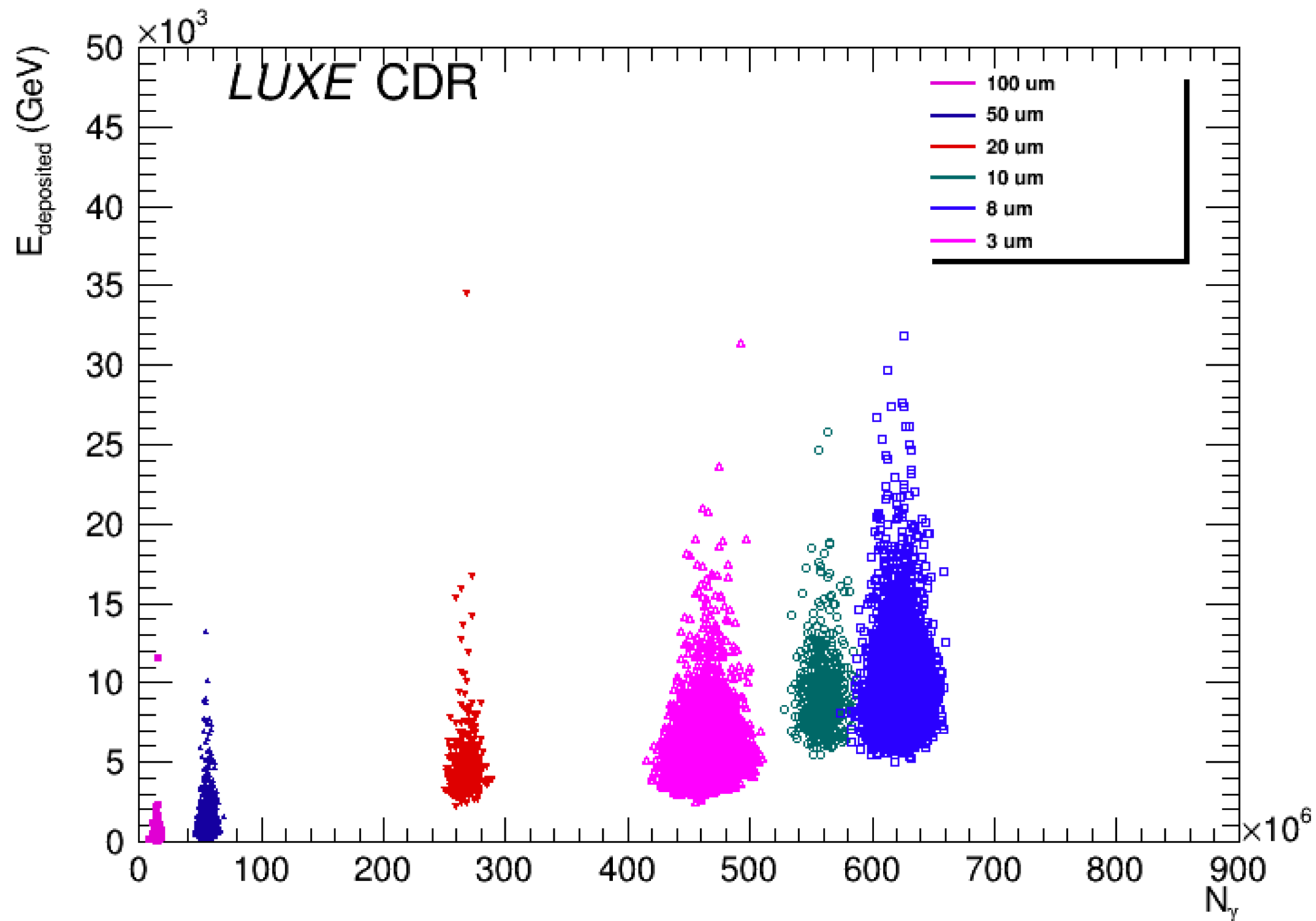
Vertex z



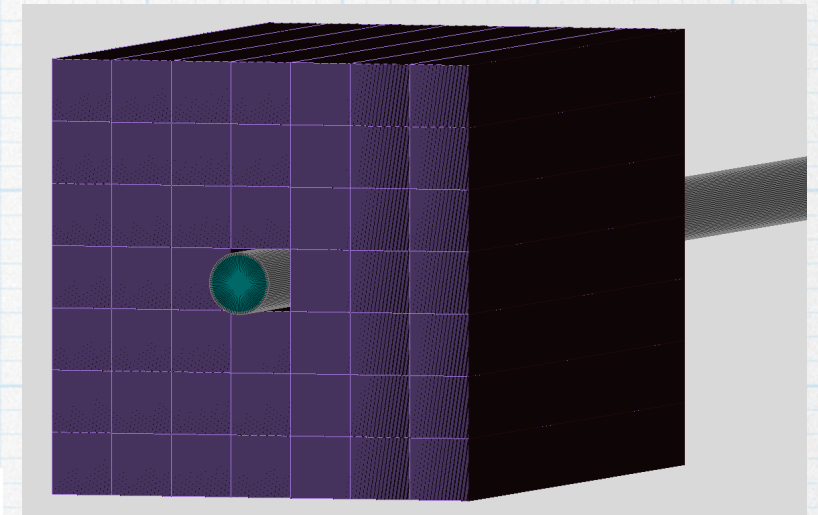
Deposited energy versus true number of photons.



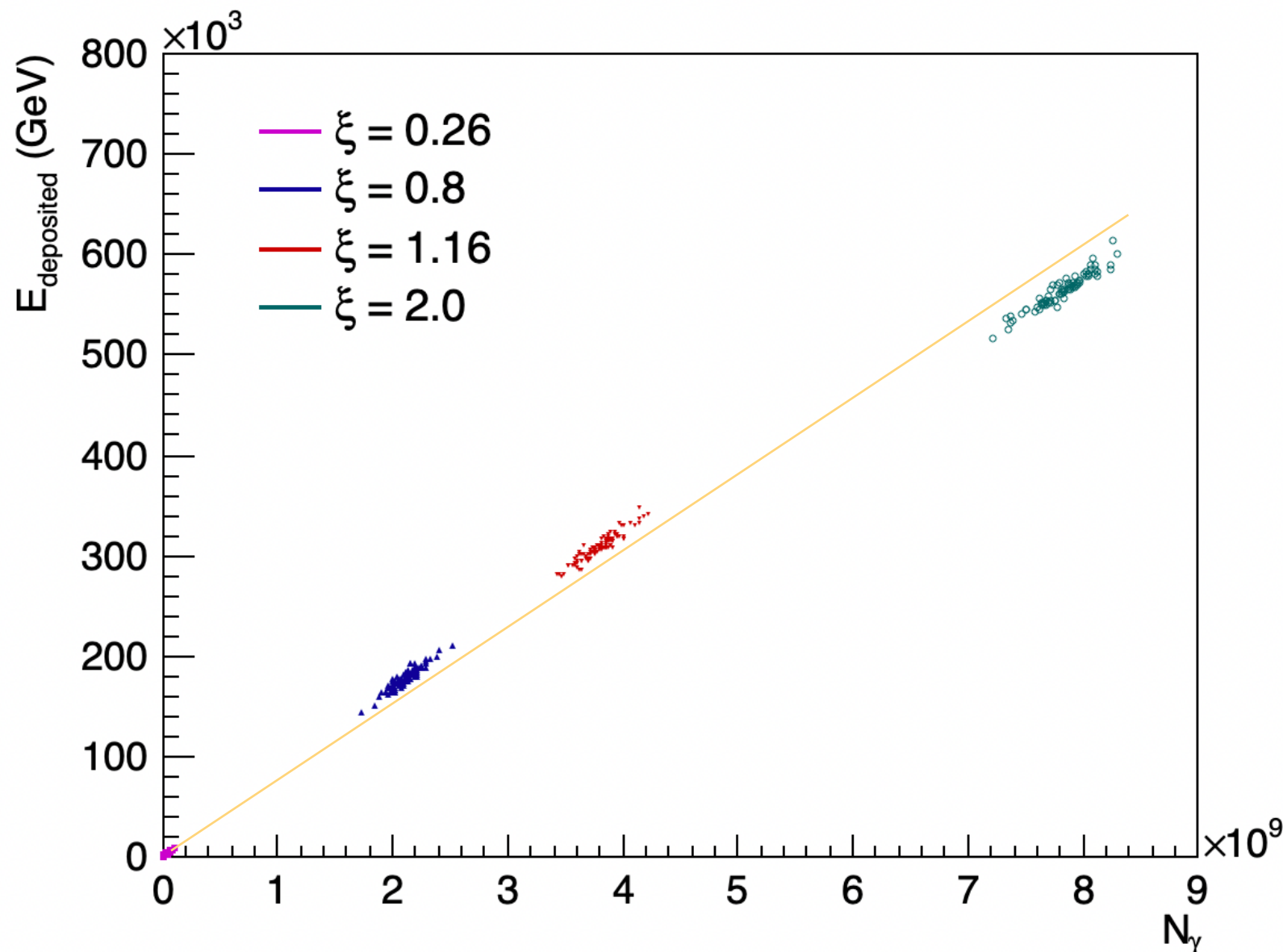
Deposited energy versus N of incident photons



Deposited energy versus true number of photons.



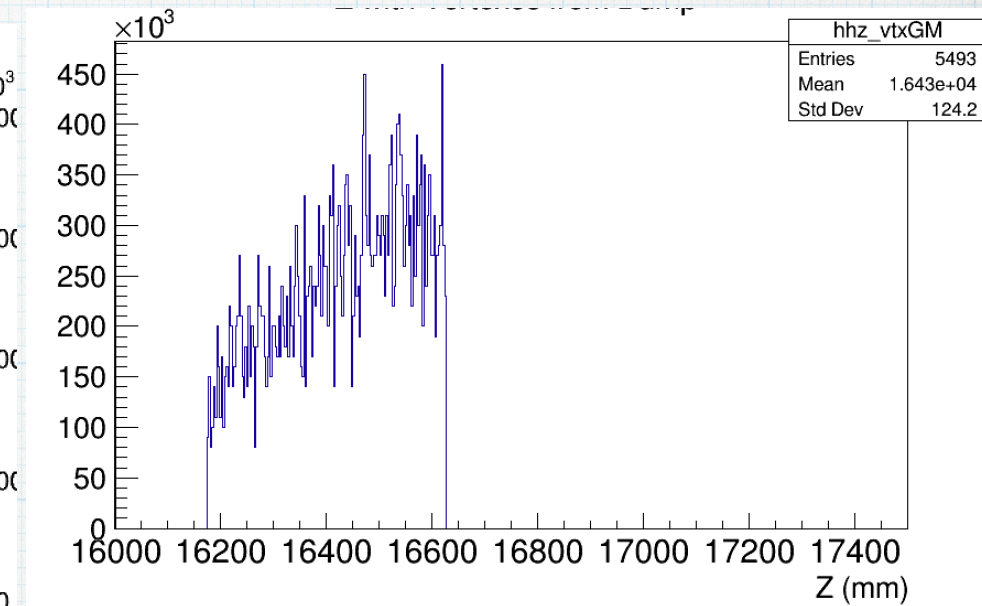
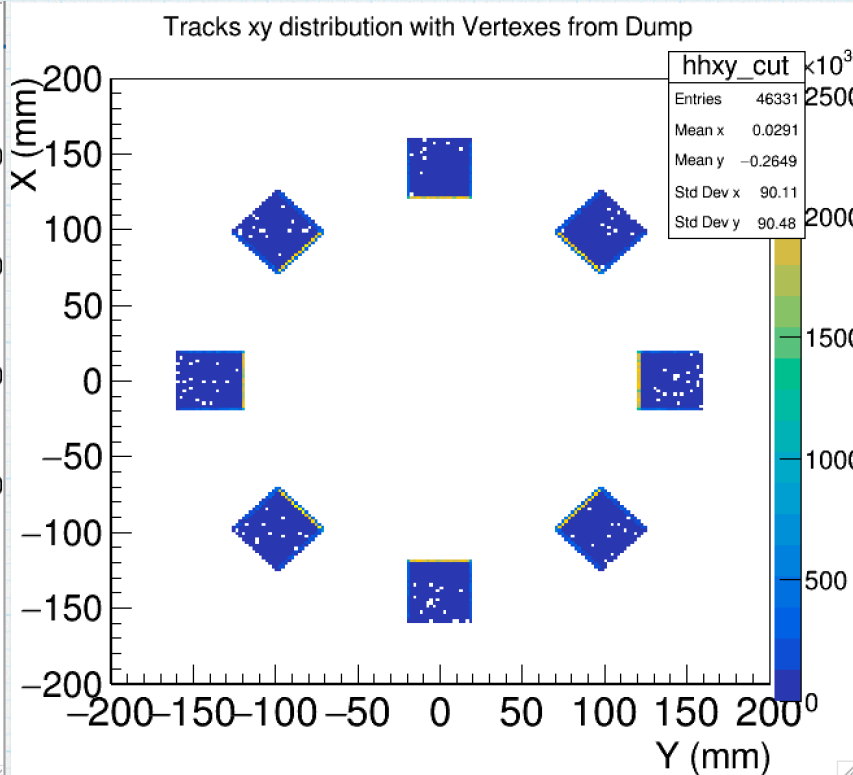
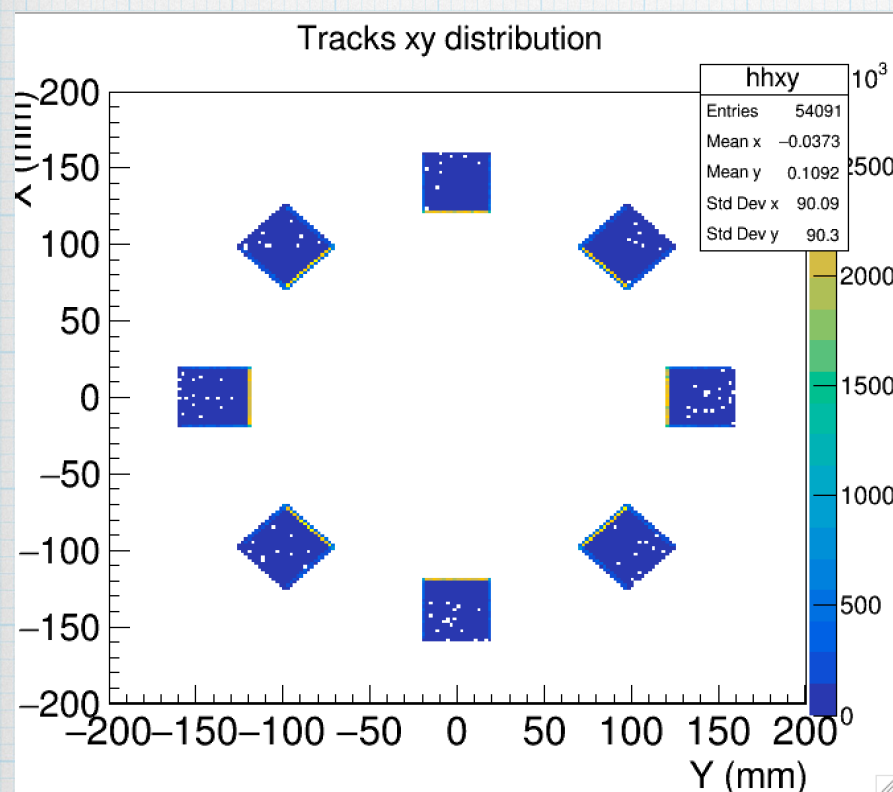
Deposited energy versus true number of photons. Each point is one BX



- The (almost) linear dependence of deposited energy on number of incoming photons in GM allows the usage of backscatters for monitoring the photon flux

Background

- Z distributions
- Tracks with vertexes only from the GM



- Background events $54091 - 46331 - 5493 = 2267$
 - Background per BX $\sim 4\%$

