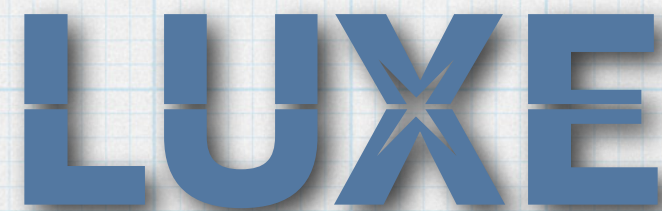
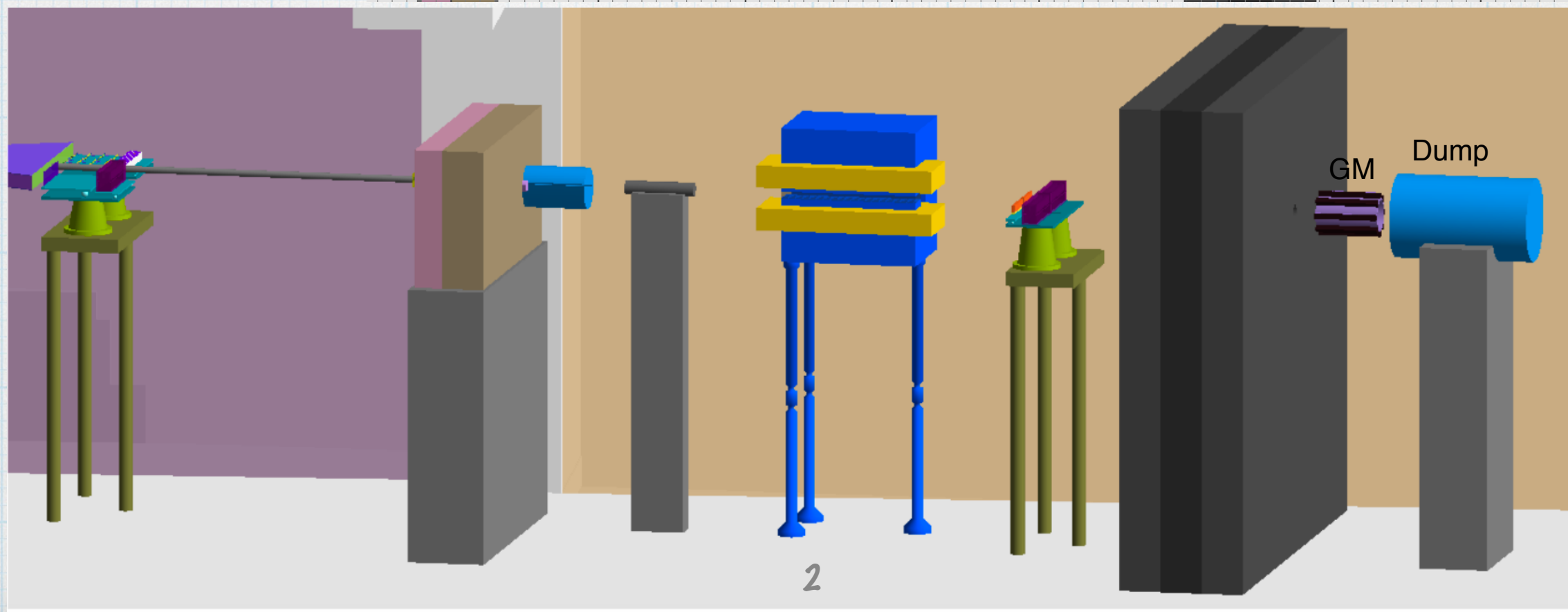
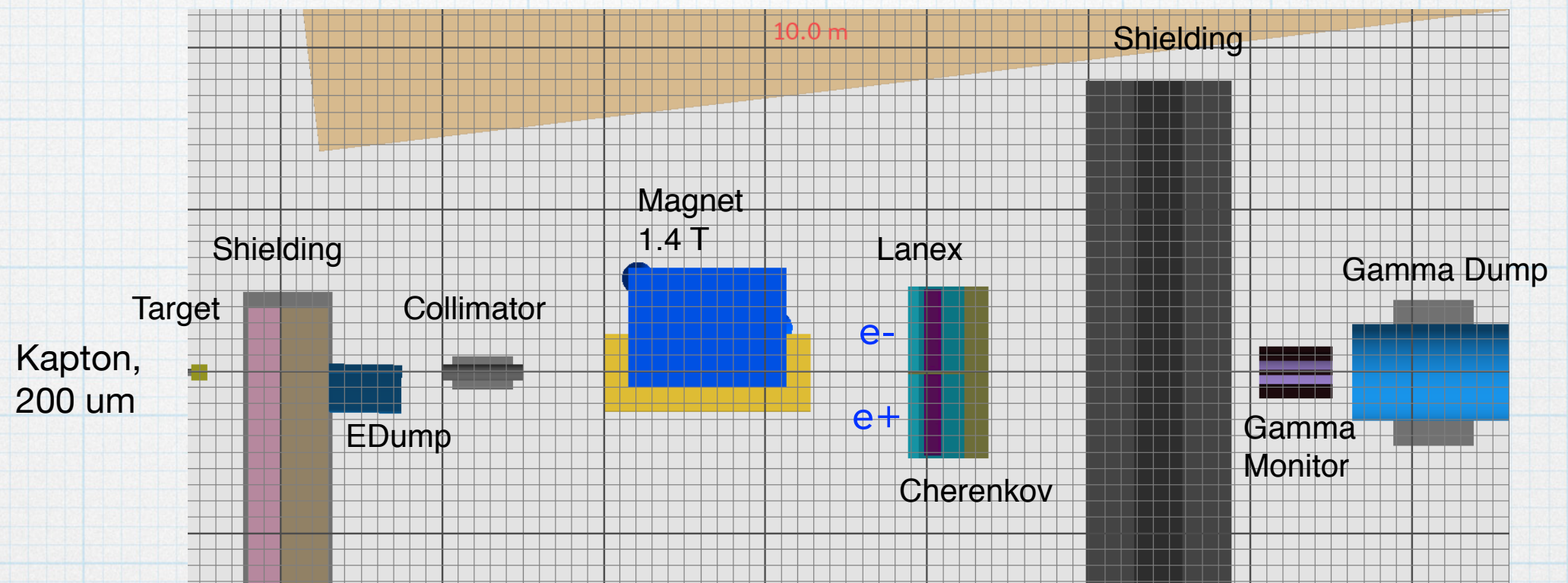


# FDS: plots for simulation chapter

Borysova Maryna (KINR)  
24/11/20  
LUXE weekly technical meeting

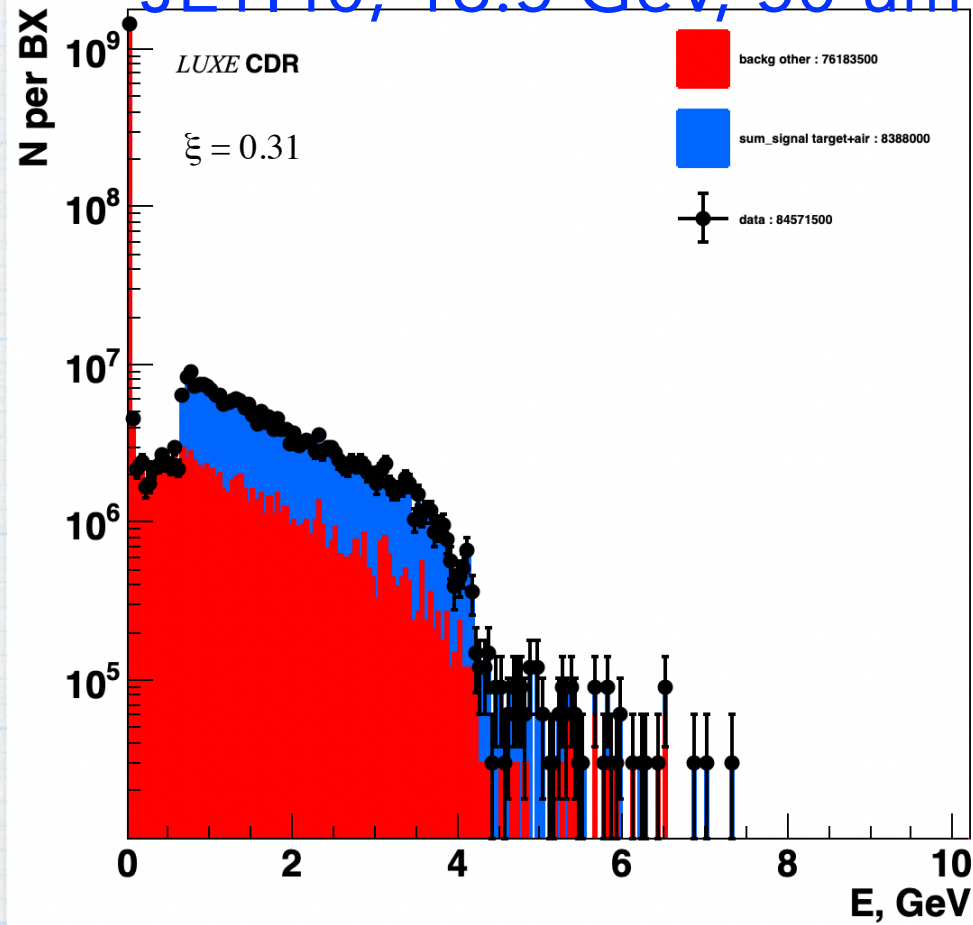
The logo for the LUXE experiment, featuring the word "LUXE" in a bold, blue, sans-serif font. The letter "X" is stylized with a grey star-like symbol in the center.

# Forward detector system w/o beam pipe

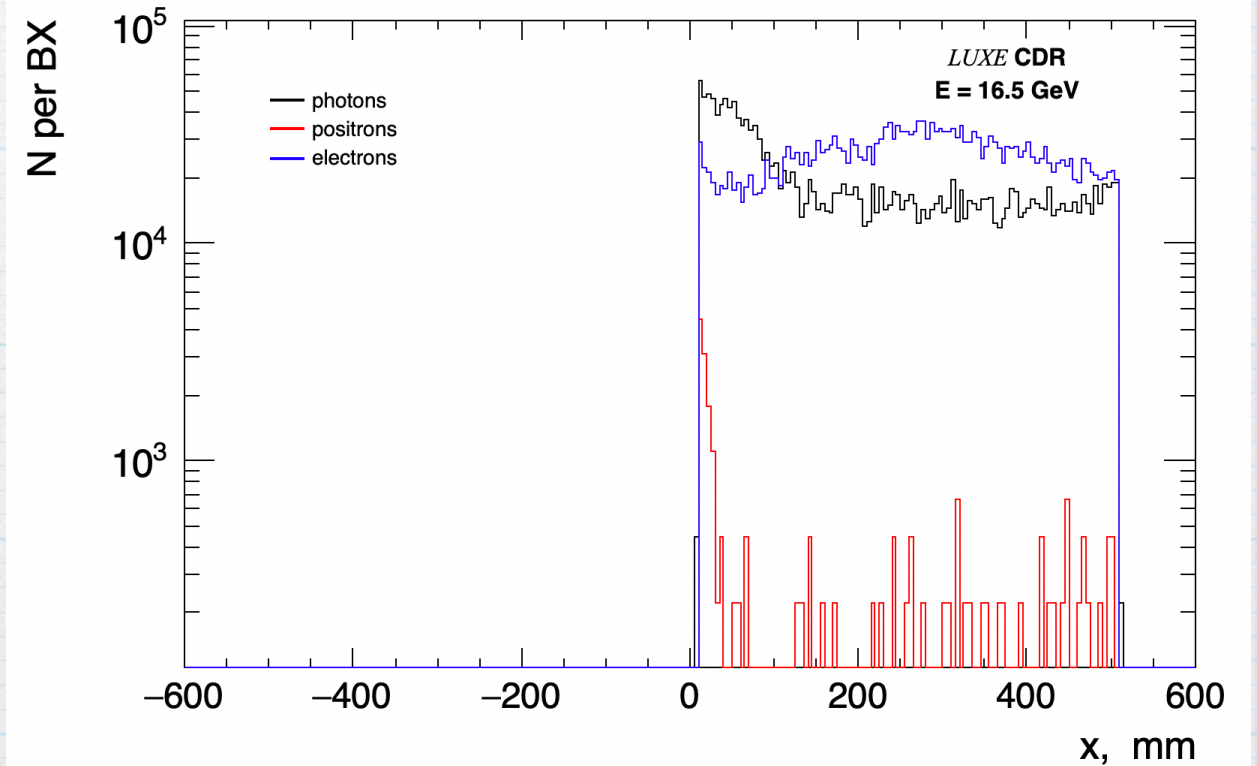
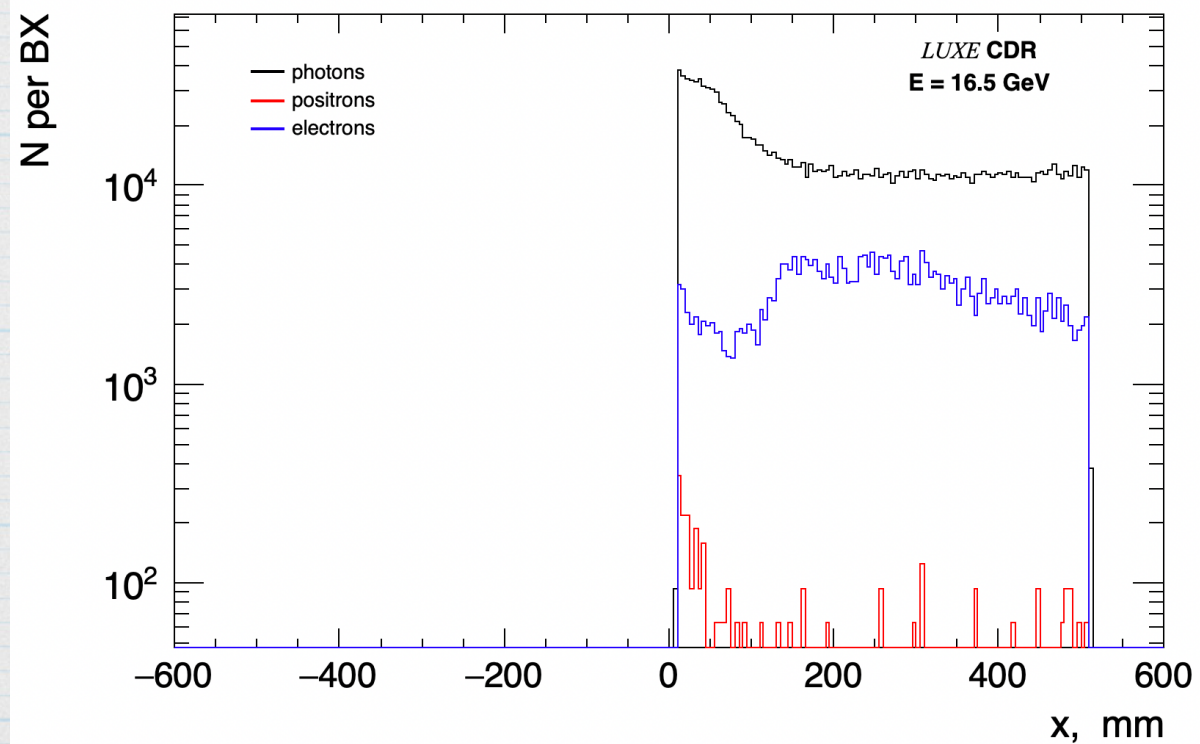
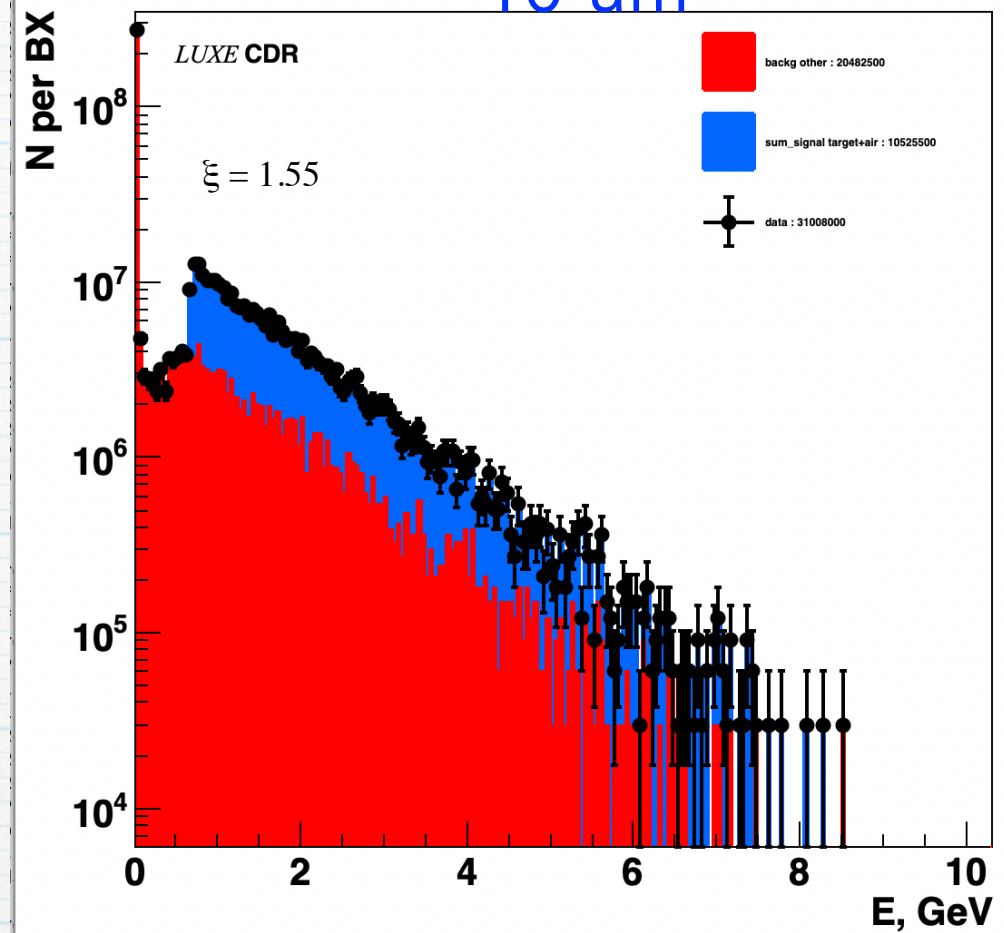


# Electron arm of Lanex Spectrometer

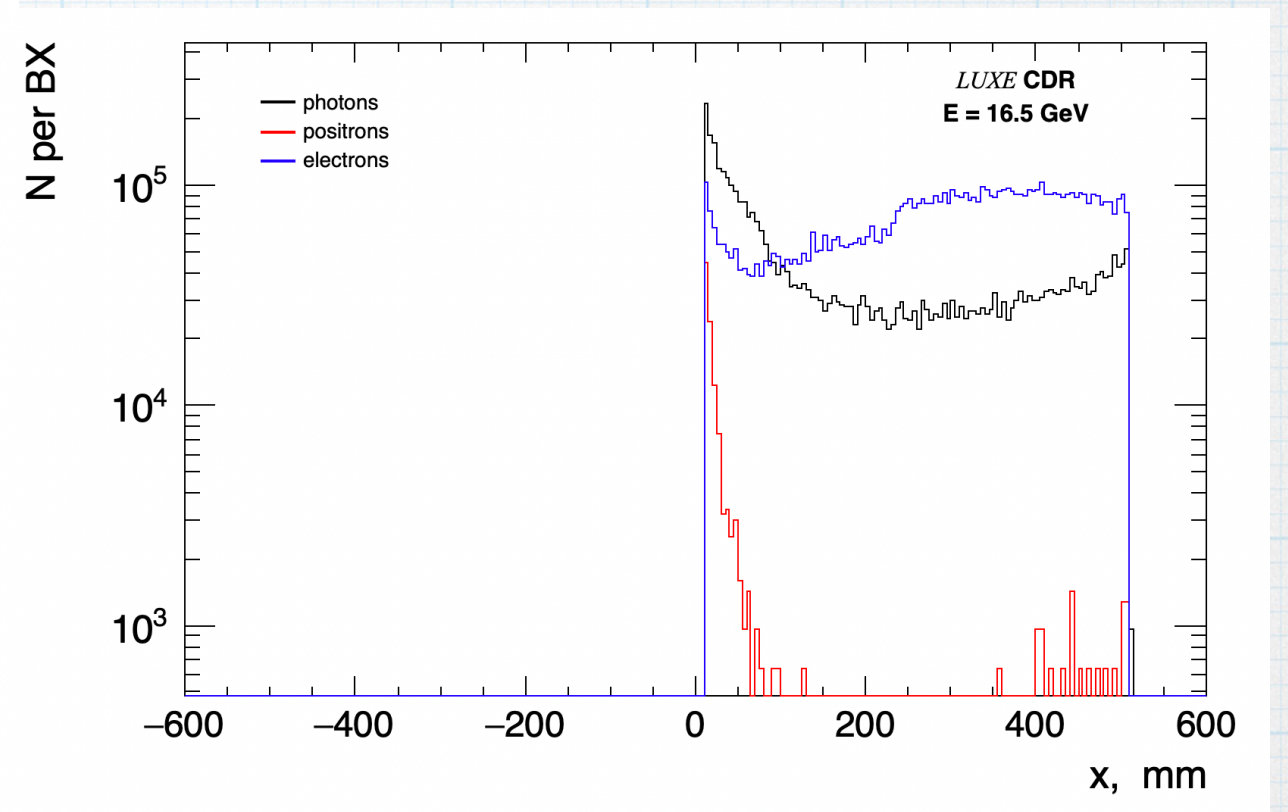
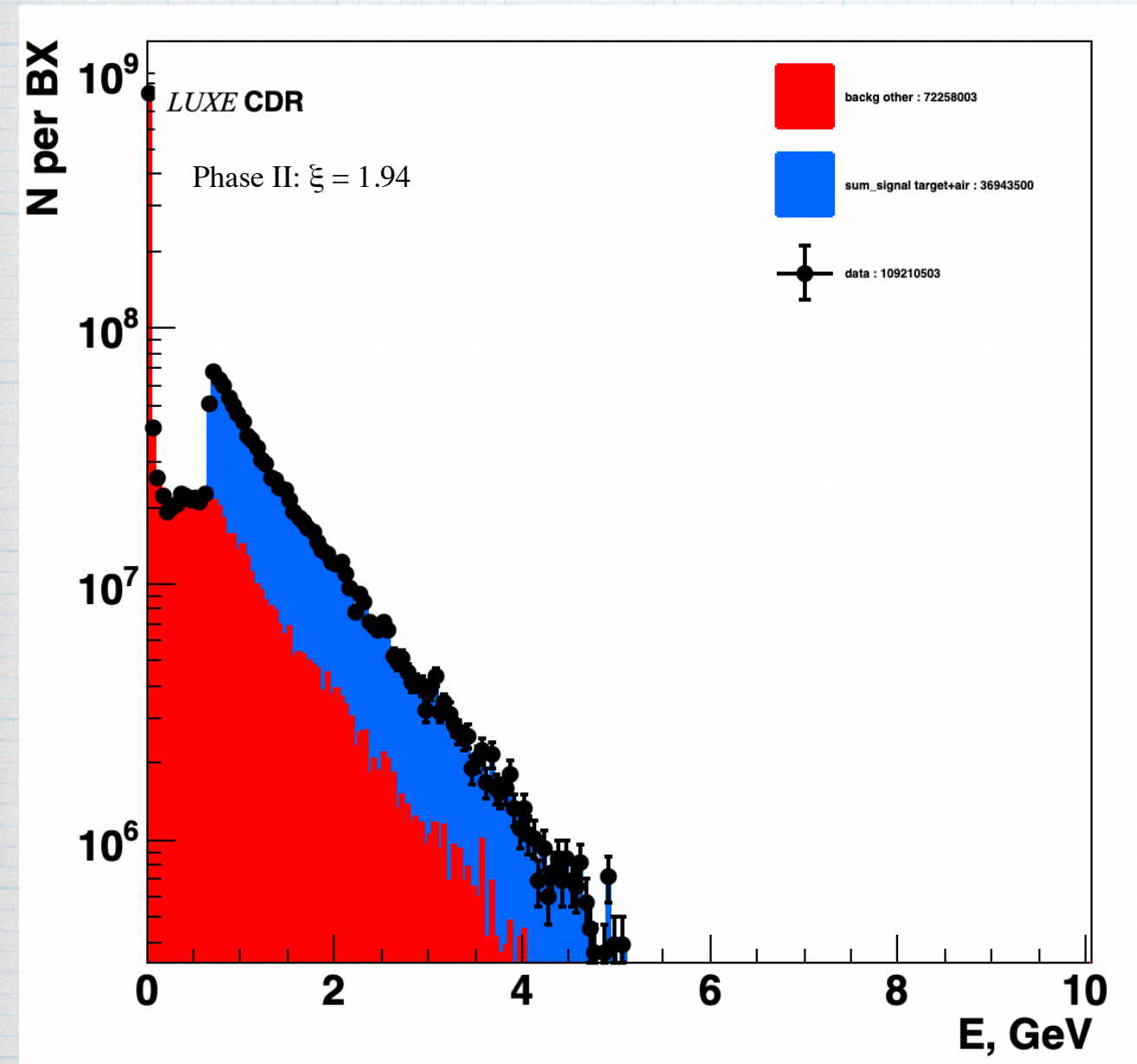
JETI40, 16.5 GeV, 50  $\mu\text{m}$



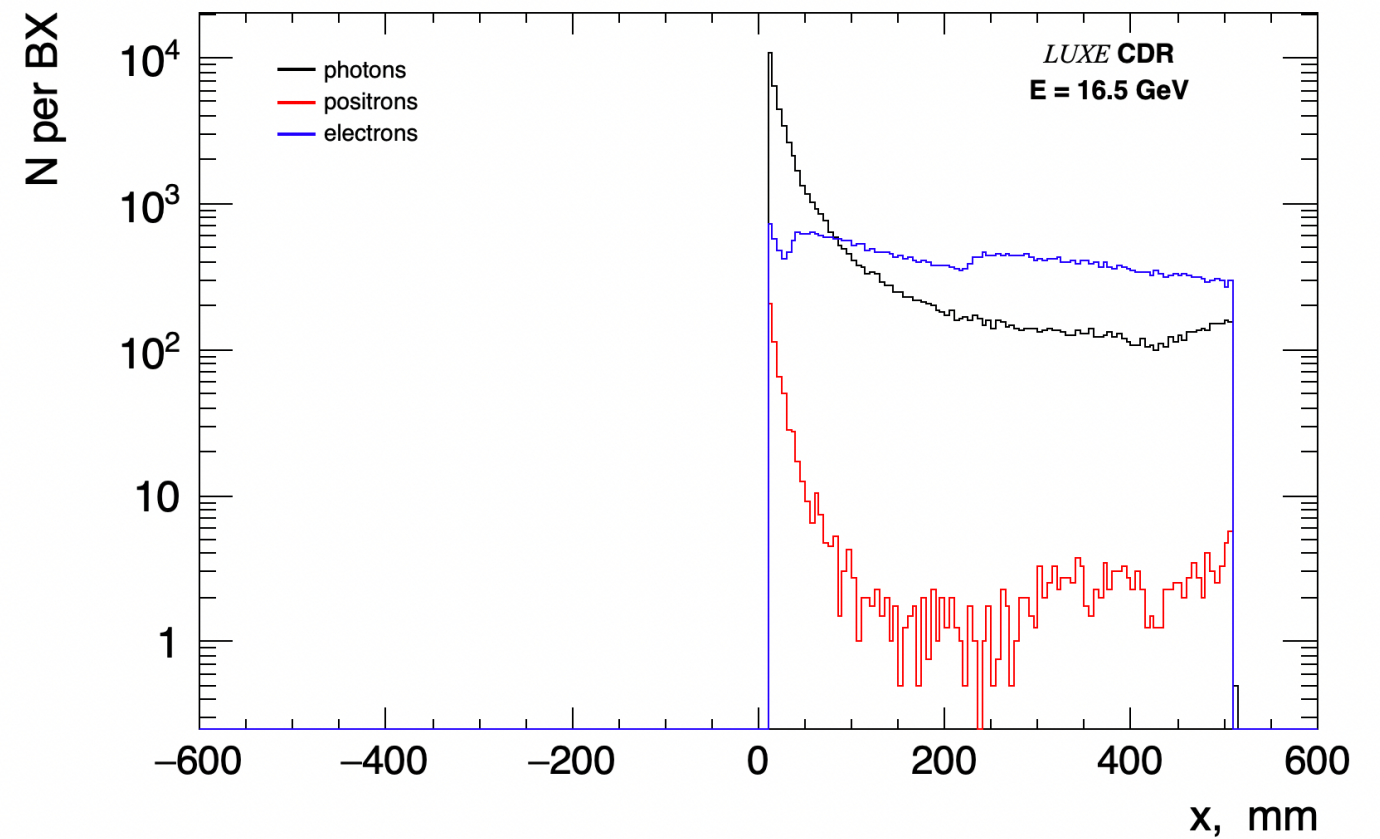
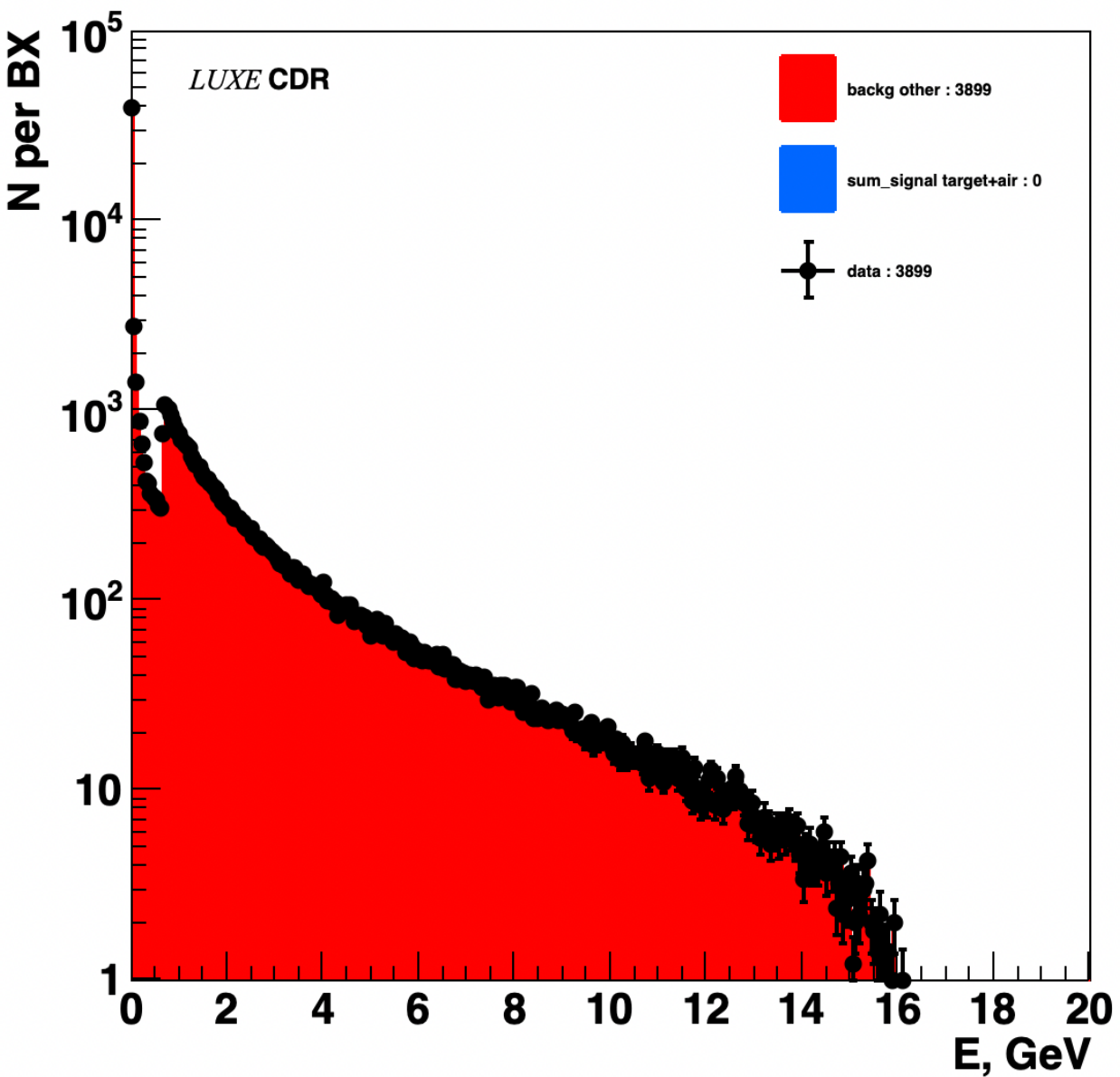
10  $\mu\text{m}$



# Phase II, 16.5 GeV, 8 um, 941 BX



# gamma+ laser bkg, 4 BX

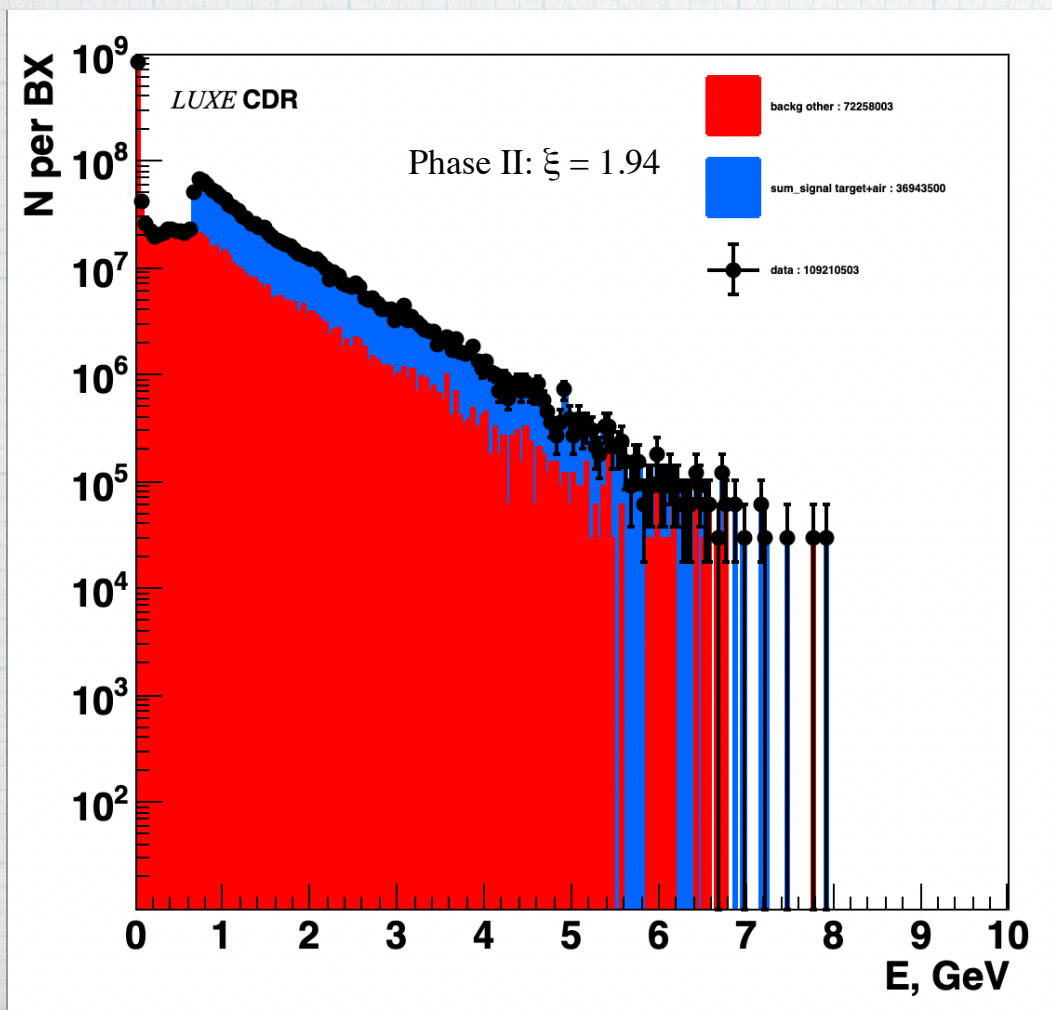
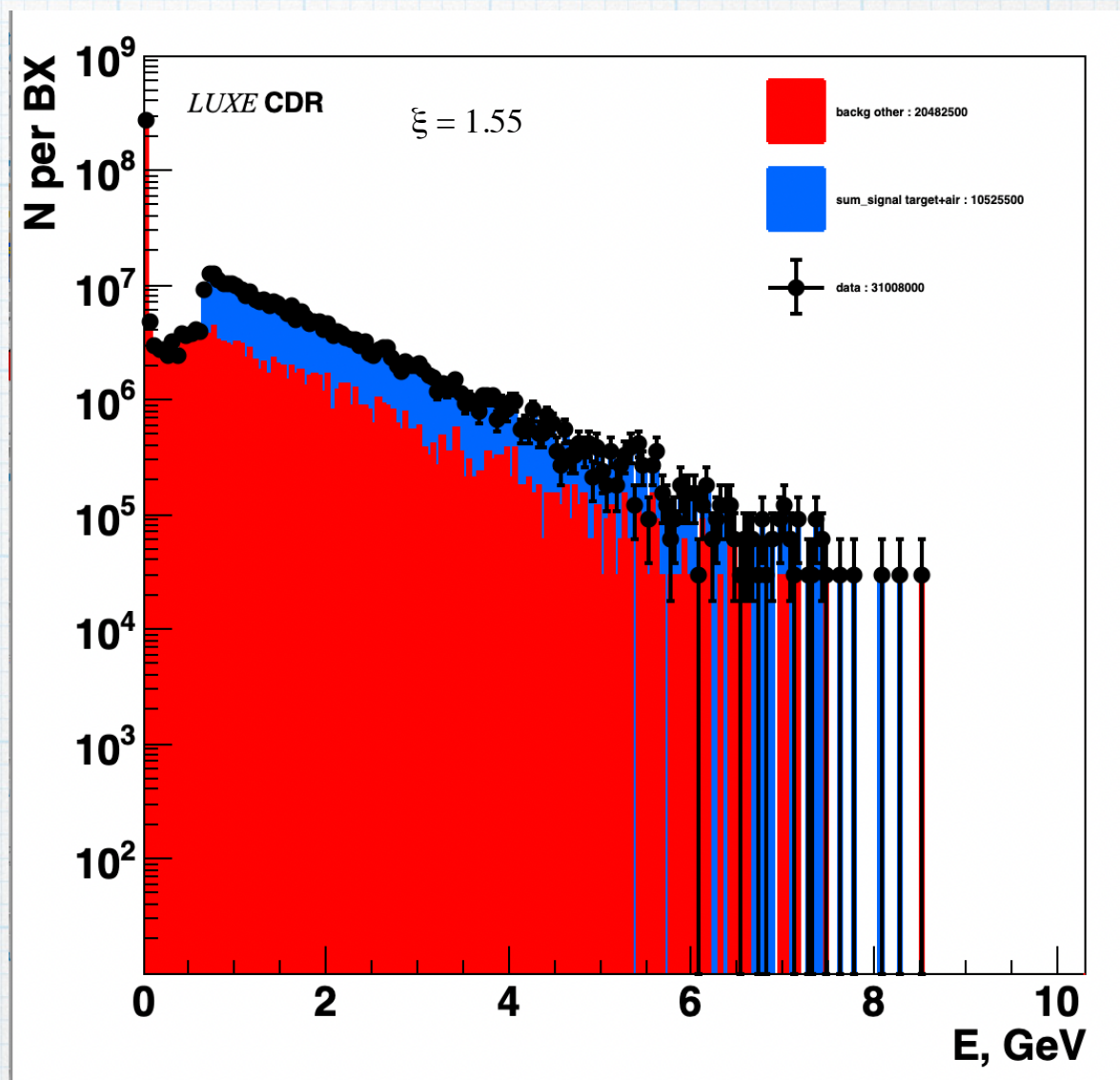
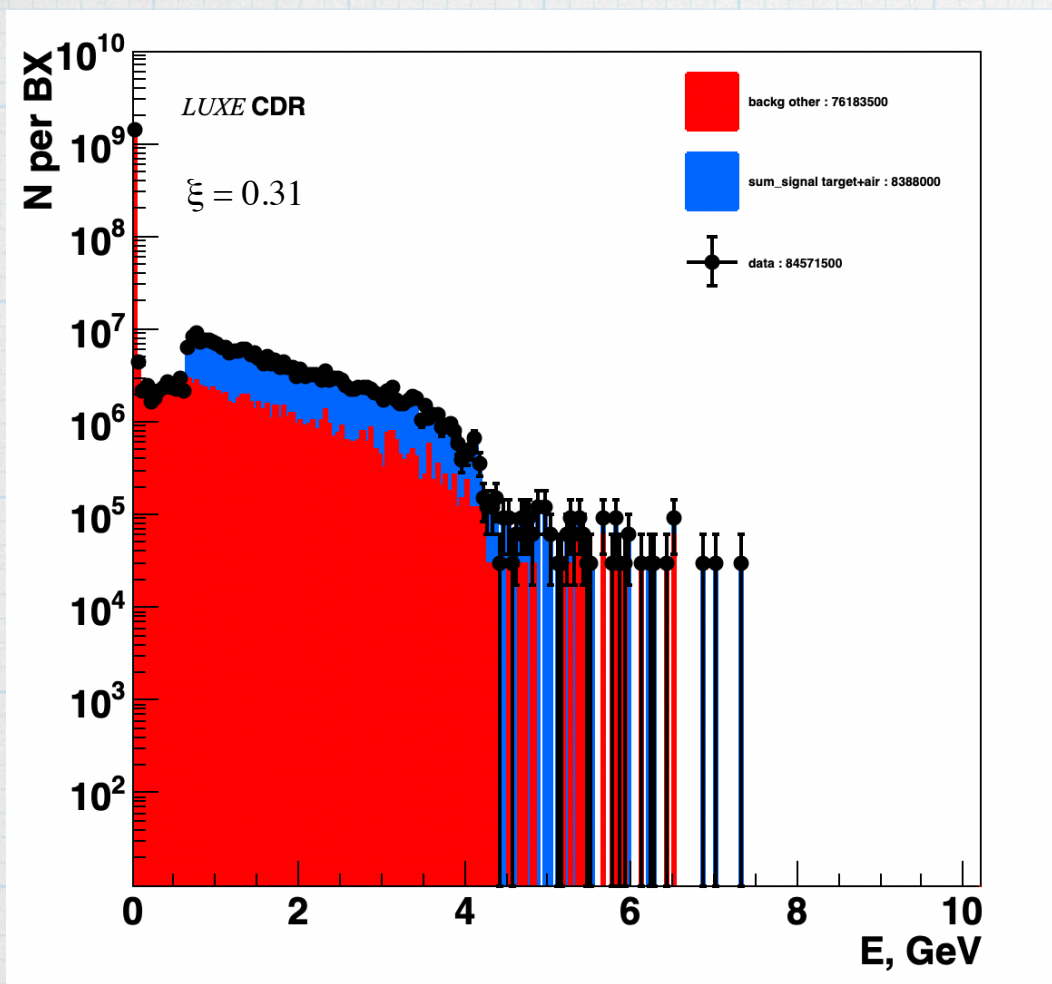


# Summary

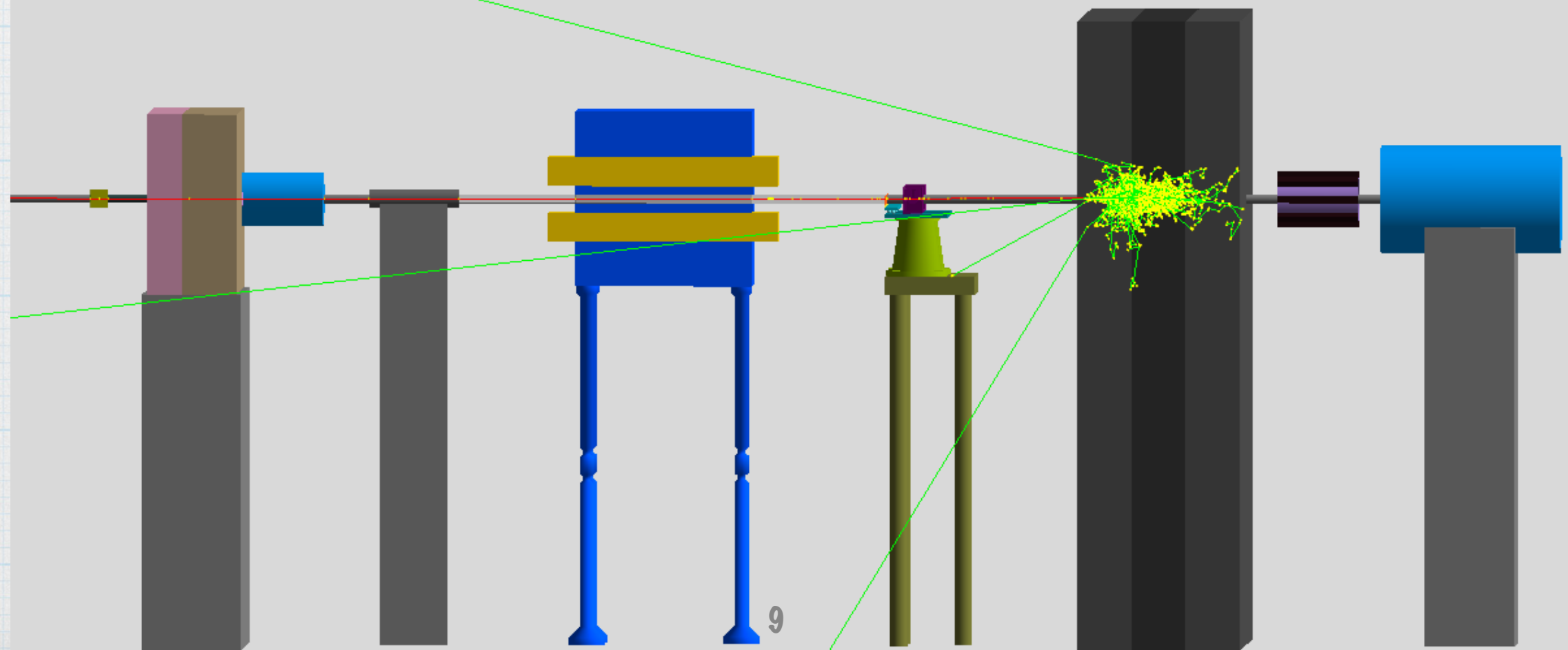
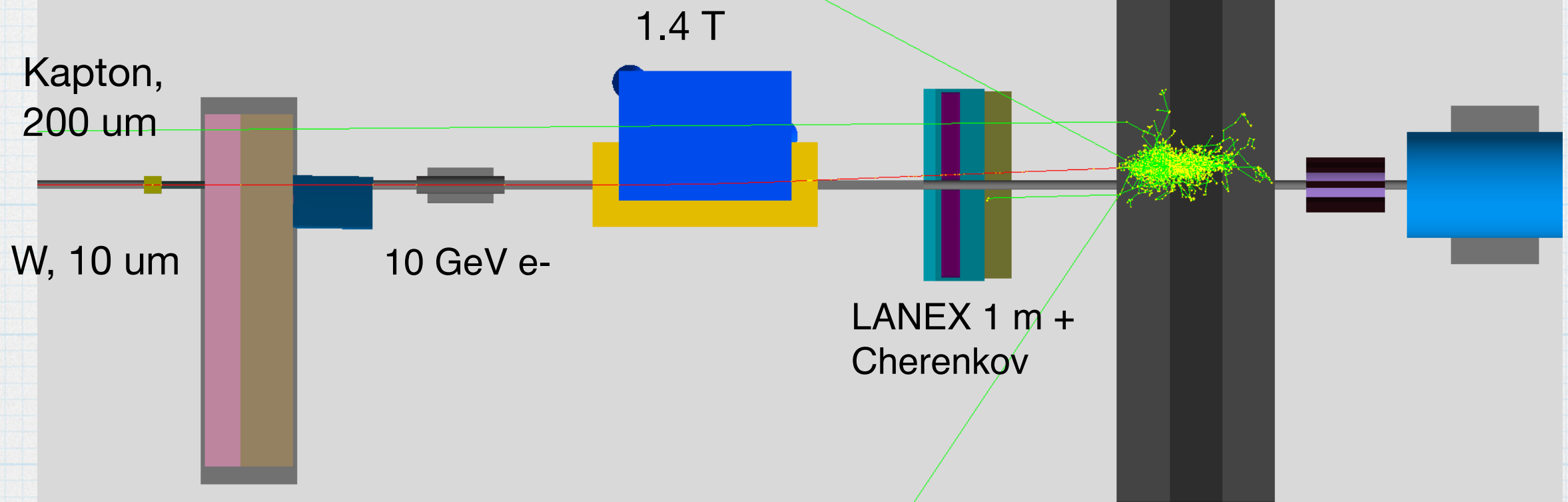
## \* The plots for FDS setup w/o beam

- S/B and Npart plots for FDS for electron-laser setup:  $\xi = 0.31$ ,  $\xi = 1.55$  and  $\xi = 3.9$ . These correspond to  $w_0 = 50 \mu\text{m}$ ,  $w_0 = 10 \mu\text{m}$  and  $w_0 = 5 \mu\text{m}$ , respectively.
- S/B and Npart plots for FDS for electron-laser setup, Phase II:  $\xi = 1.94$  (correspond to  $w_0 = 8 \mu\text{m}$ ).
- S/B and Npart plots for FDS for gamma-laser setup, background, 4BX
- For Photon spectrometer and backscattering calorimeter new “provisional” MC are run through Geant simulation; reproduce the plot to illustrate that number of hits in LANEX and in Gamma Monitor correlate well with number of photons produced in interaction vs  $\xi$

Back up

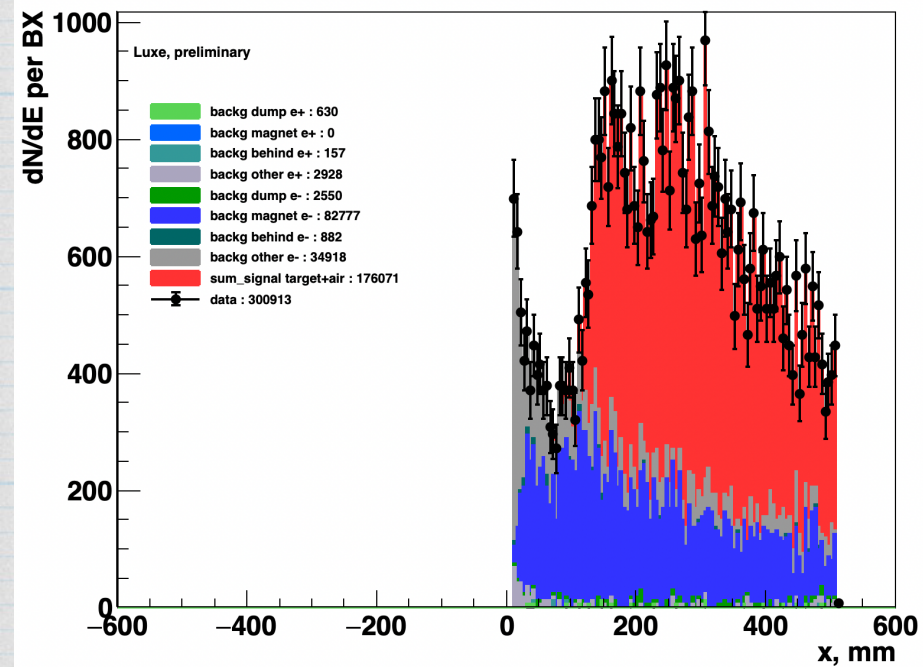


# Updated FDS setup with pipe

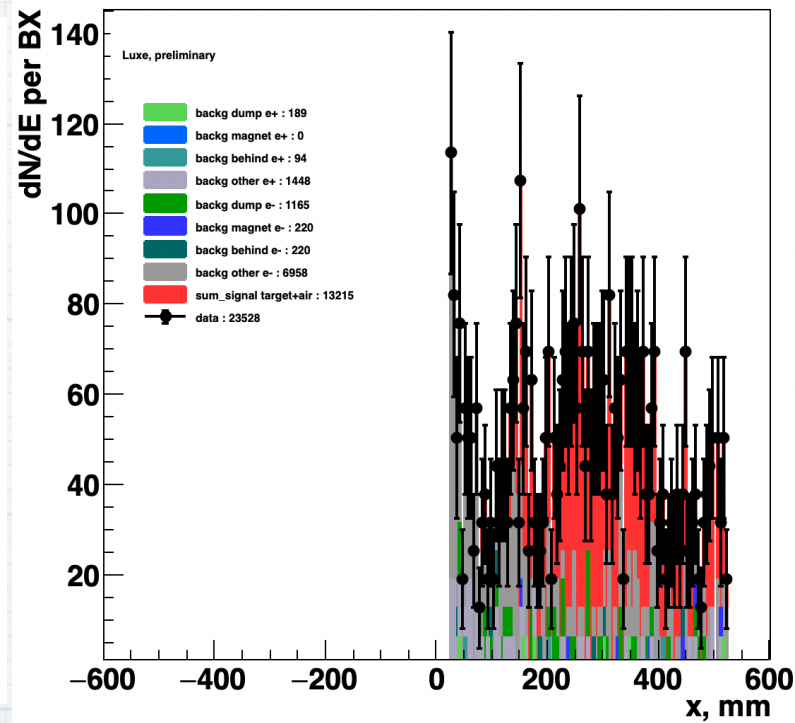


# \* Electron arm of Lanex Spectrometer

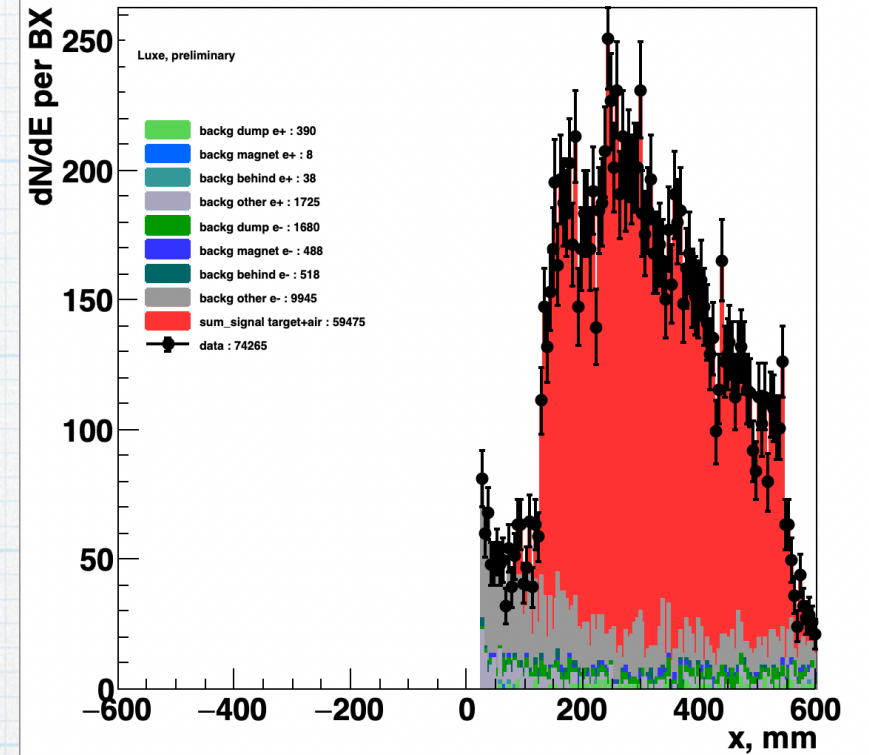
NO Beam Pipe  
Kapton, 200  $\mu\text{m}$



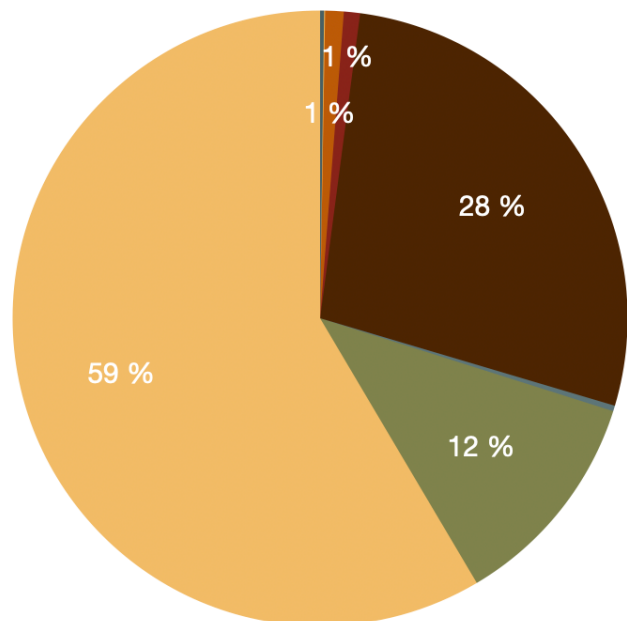
Beam Pipe 5 cm  
Kapton, 200  $\mu\text{m}$



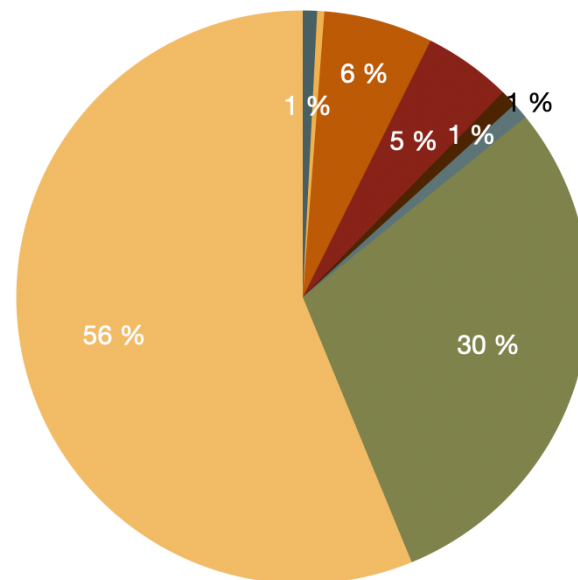
Beam Pipe 5 cm  
W, 10  $\mu\text{m}$



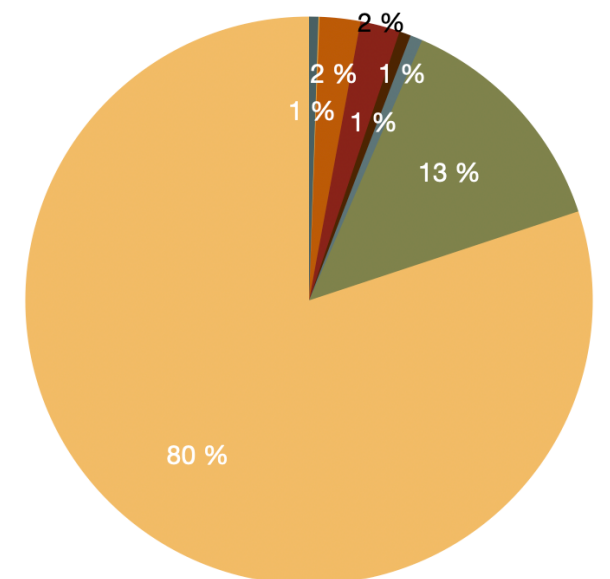
dump pos magnet pos behind pos other pos dump el magnet el behind el other el Signal



dump pos magnet pos behind pos other pos dump el magnet el behind el other el Signal

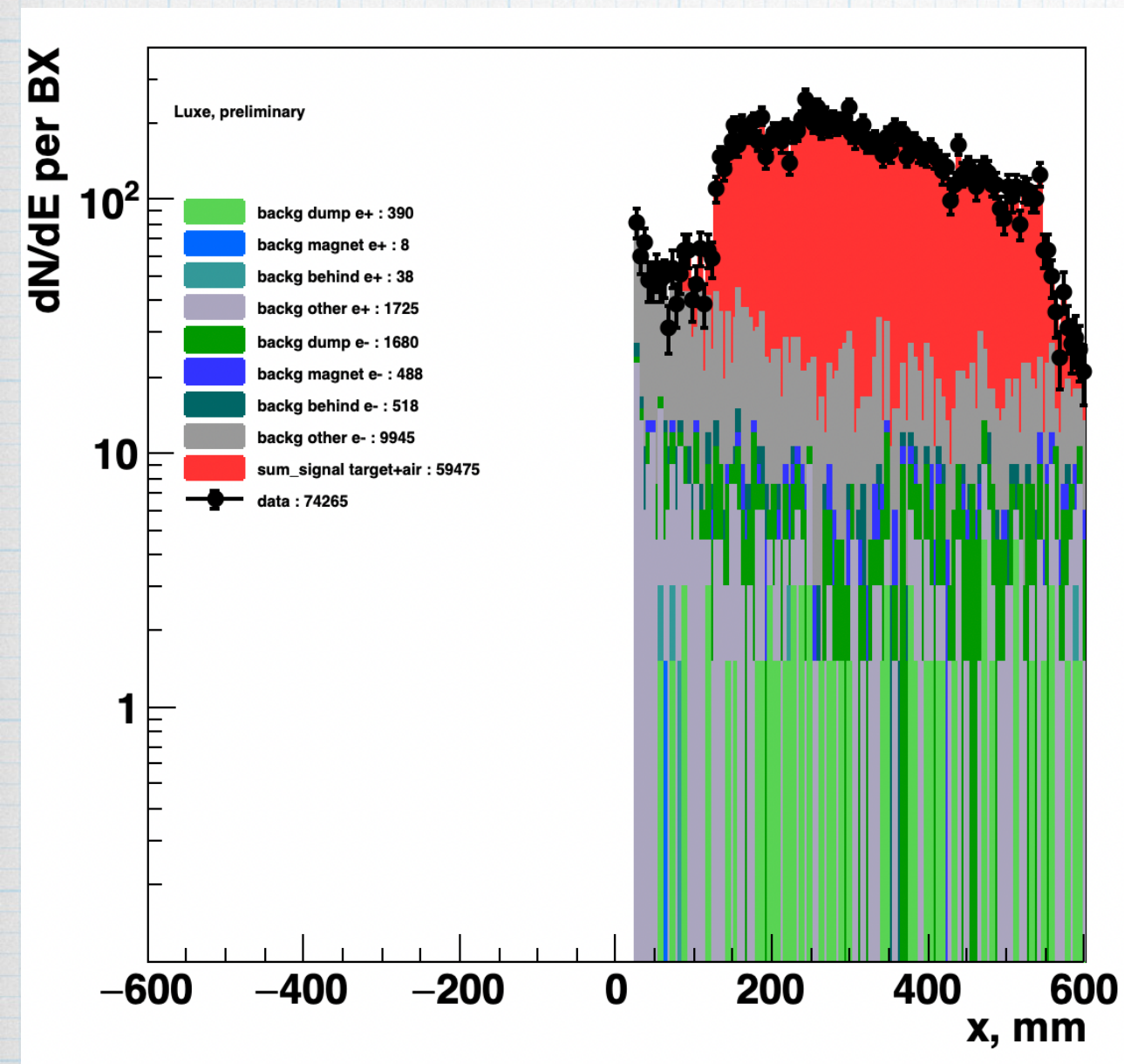


dump pos magnet pos behind pos other pos dump el magnet el behind el other el Signal

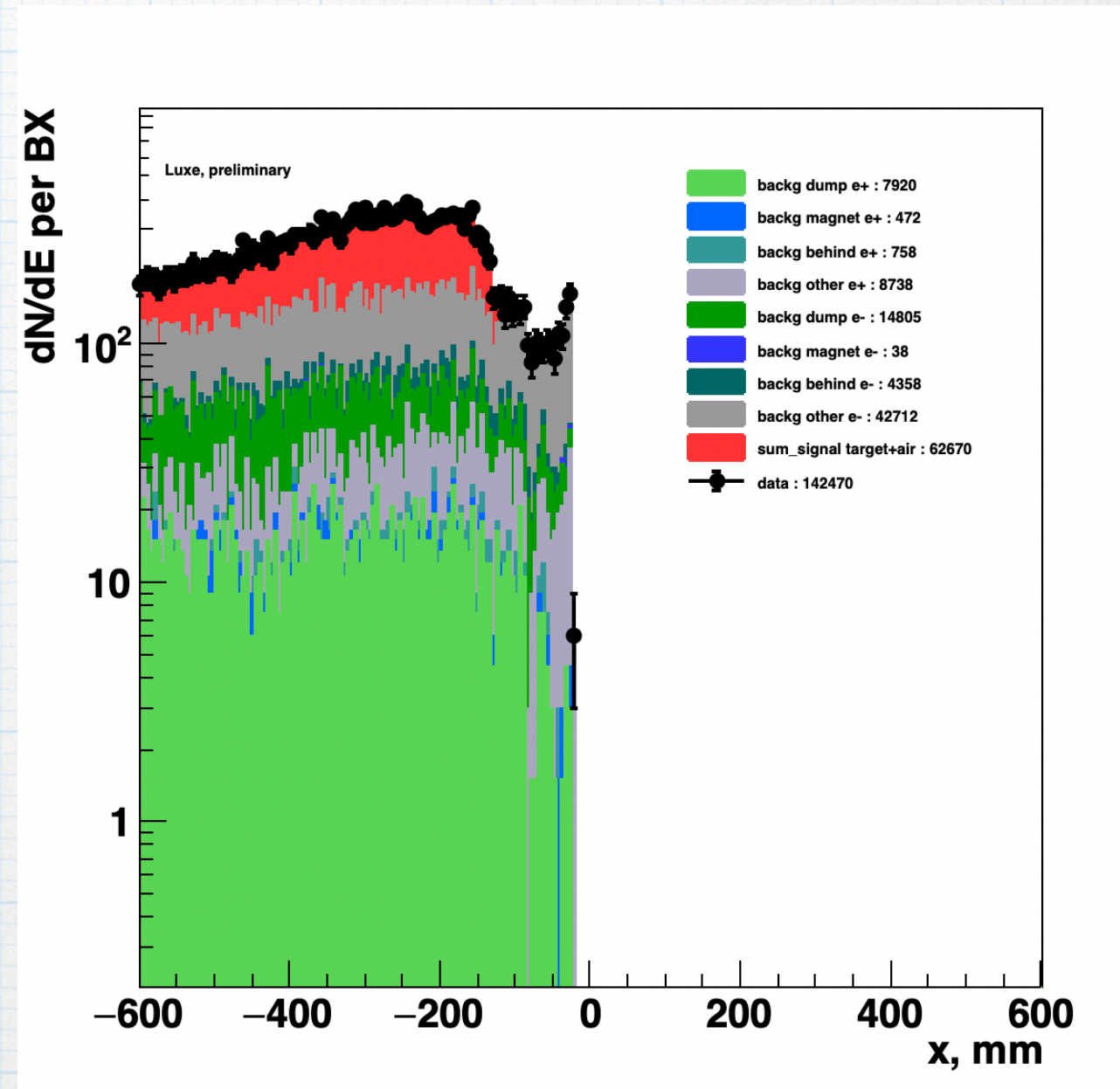


# Background: Beam Pipe 5 cm, W 10 $\mu$ m, log scale

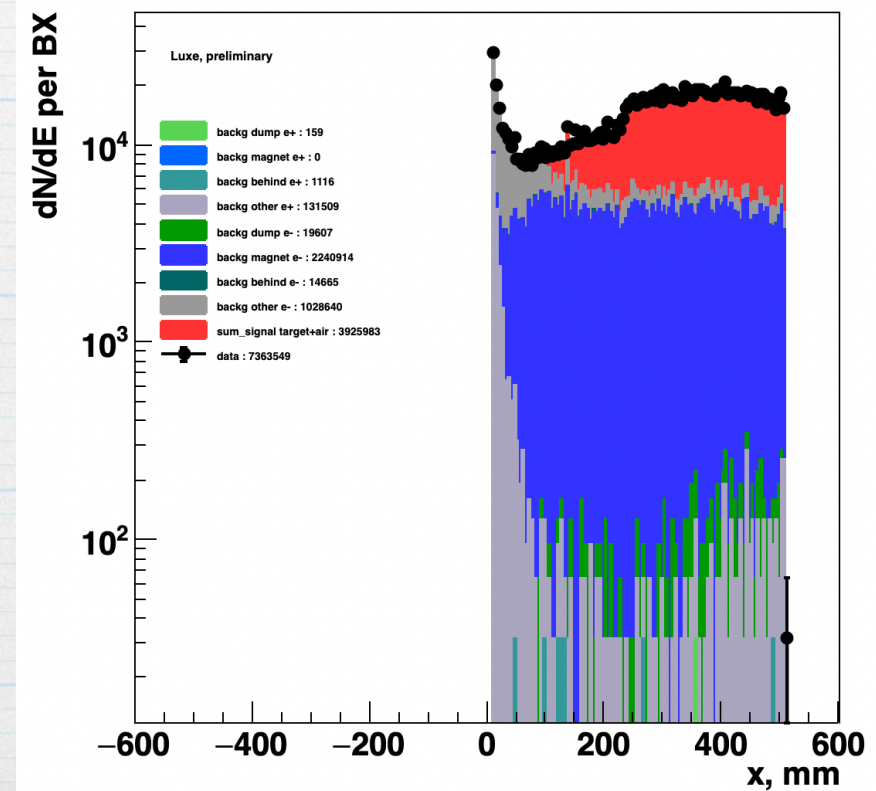
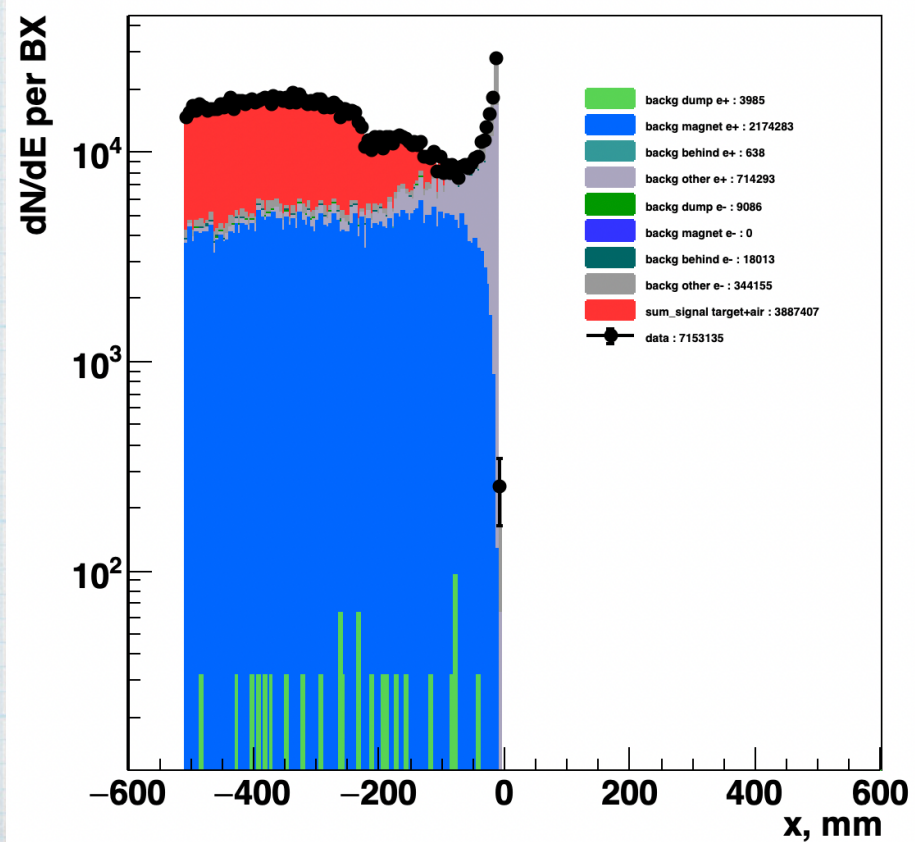
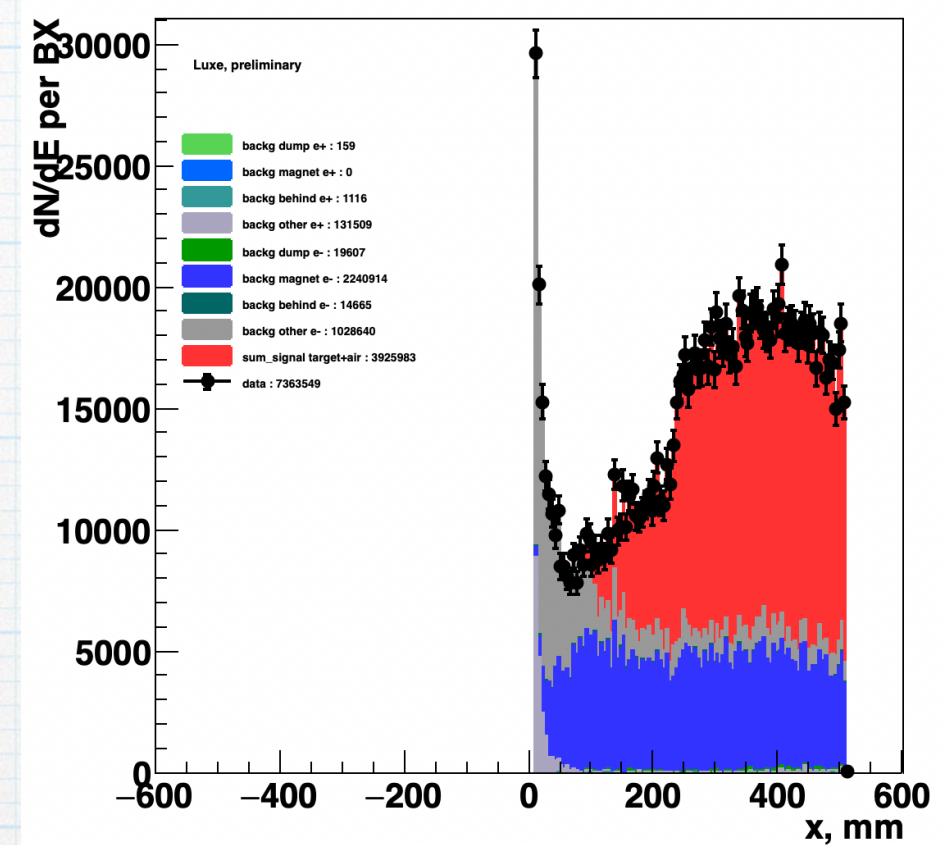
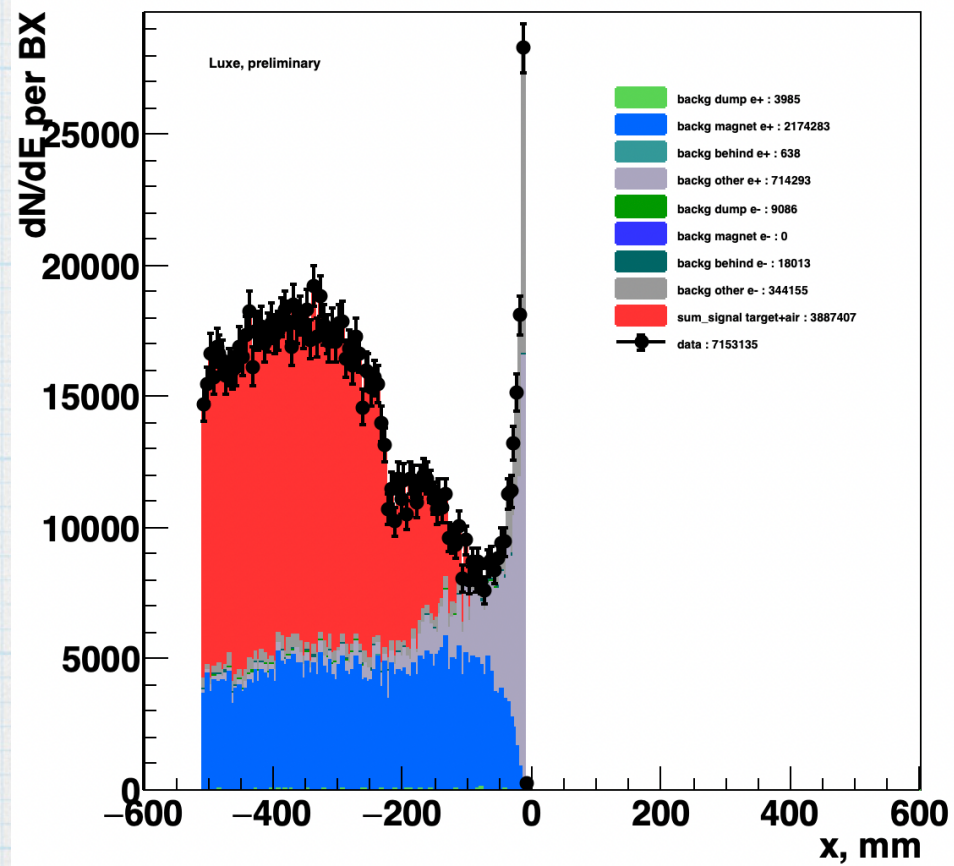
\* Electron arm



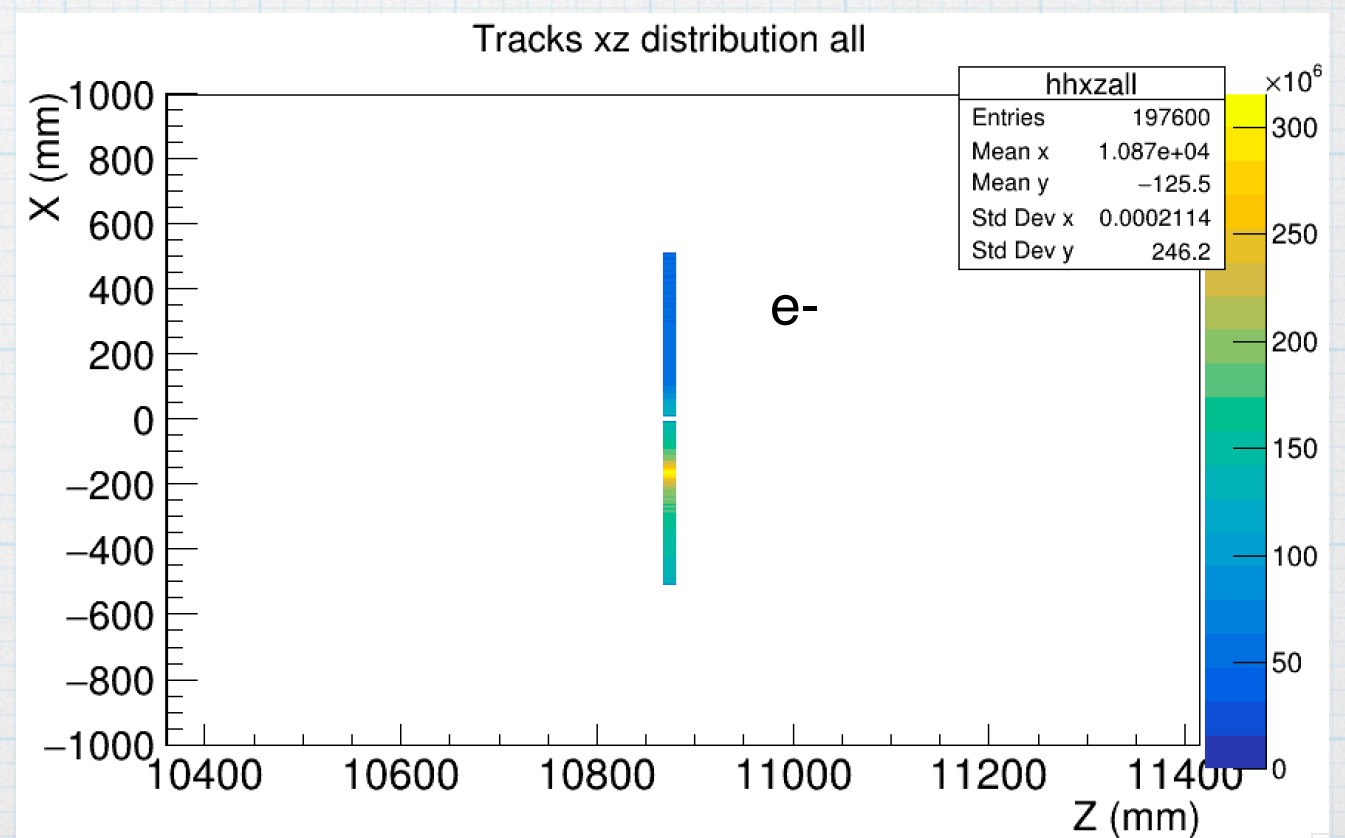
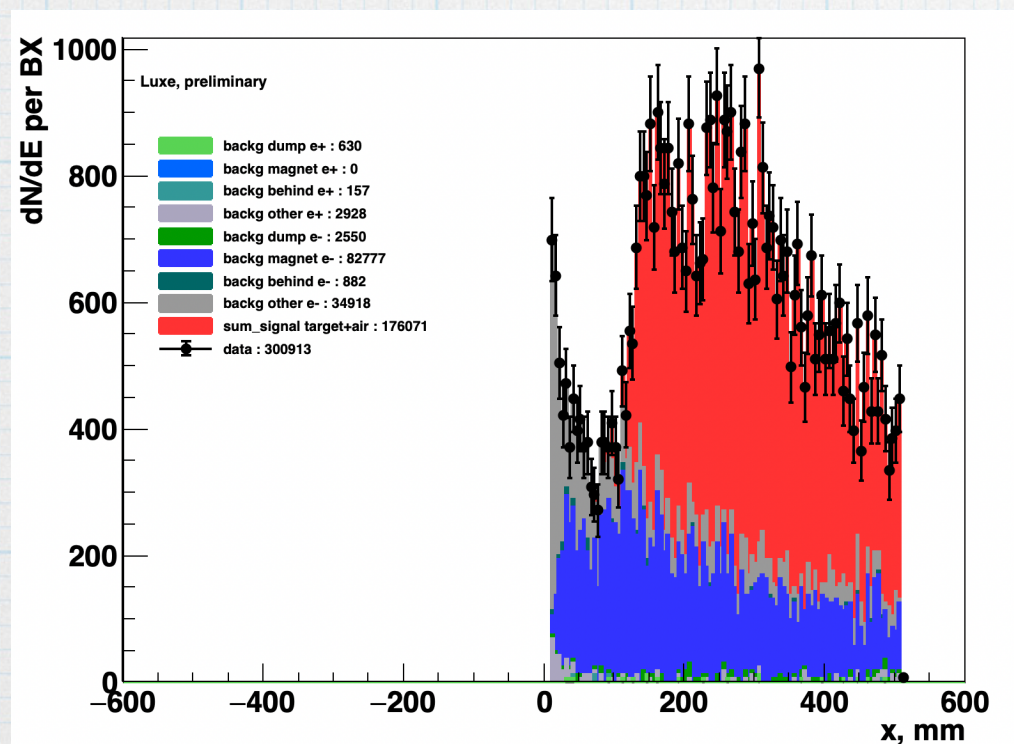
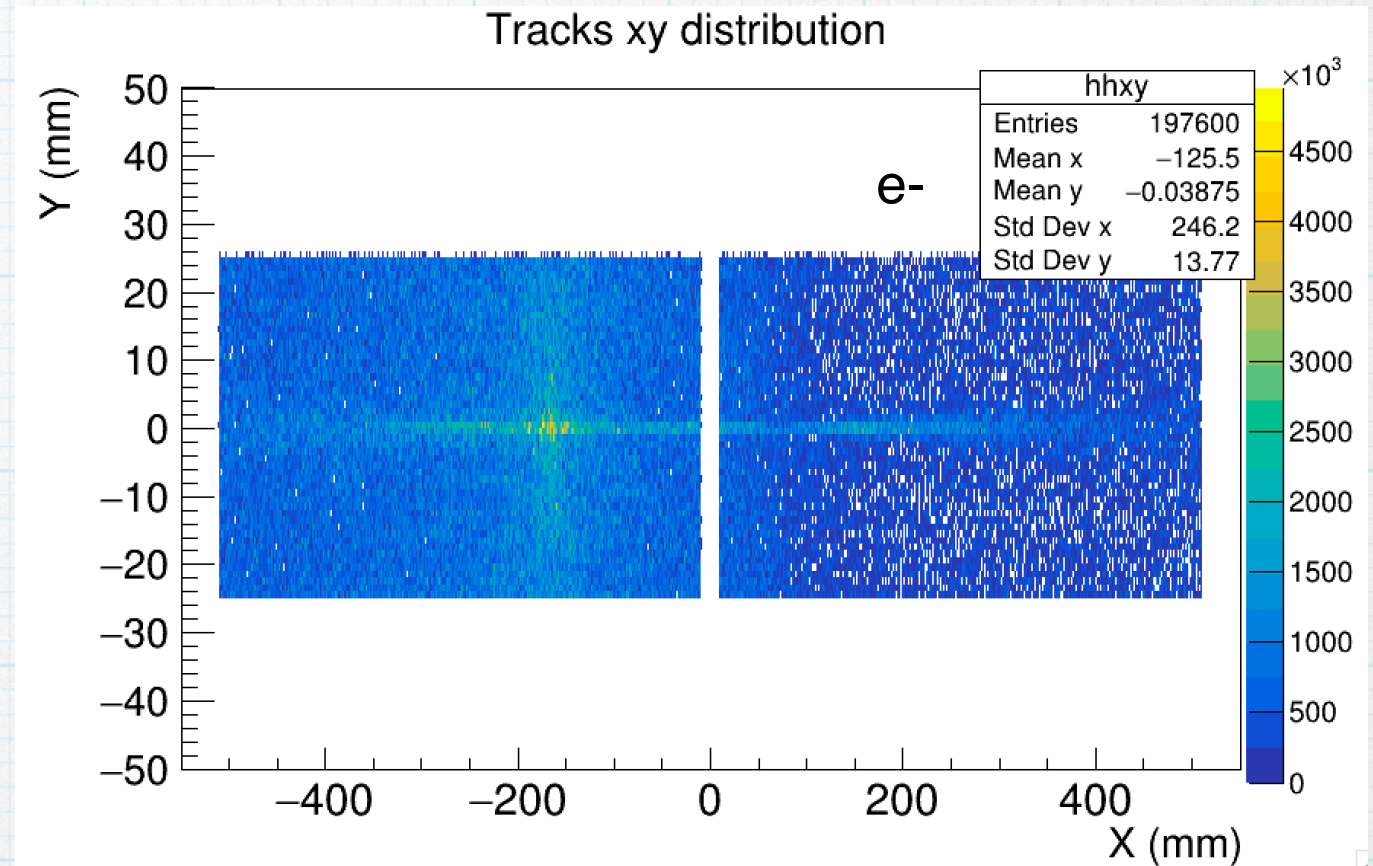
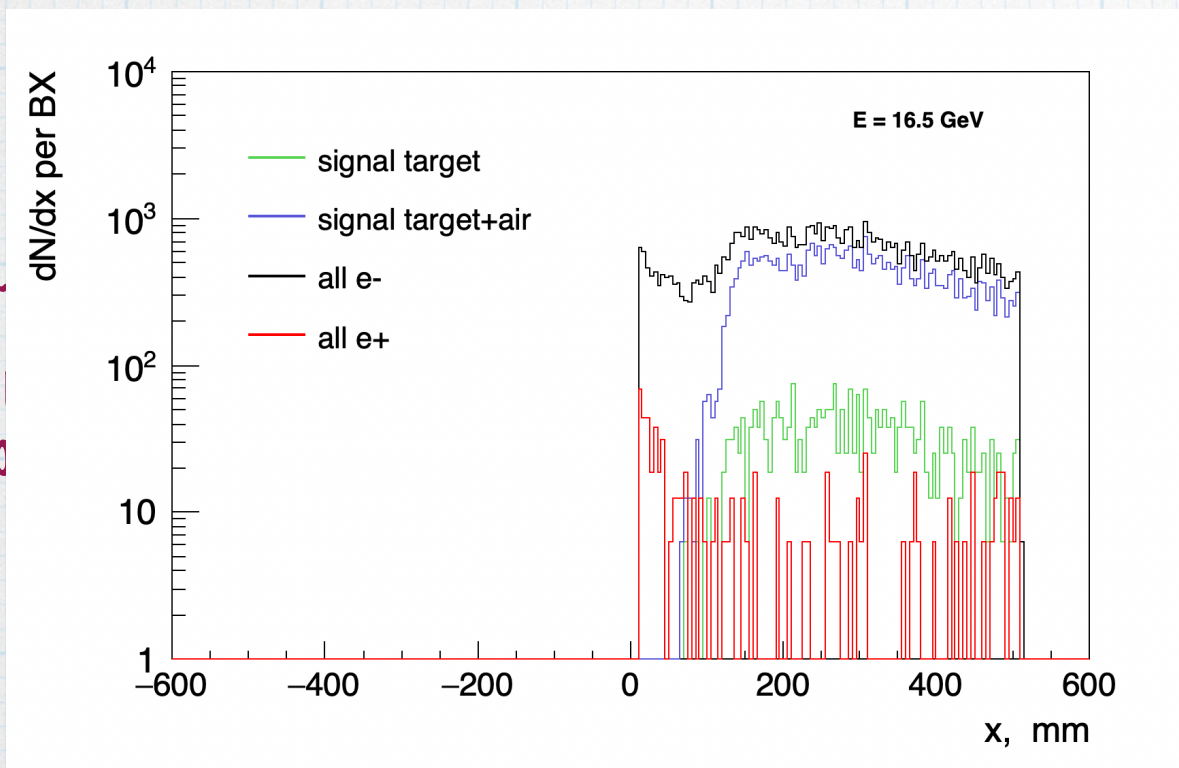
\* Positron arm



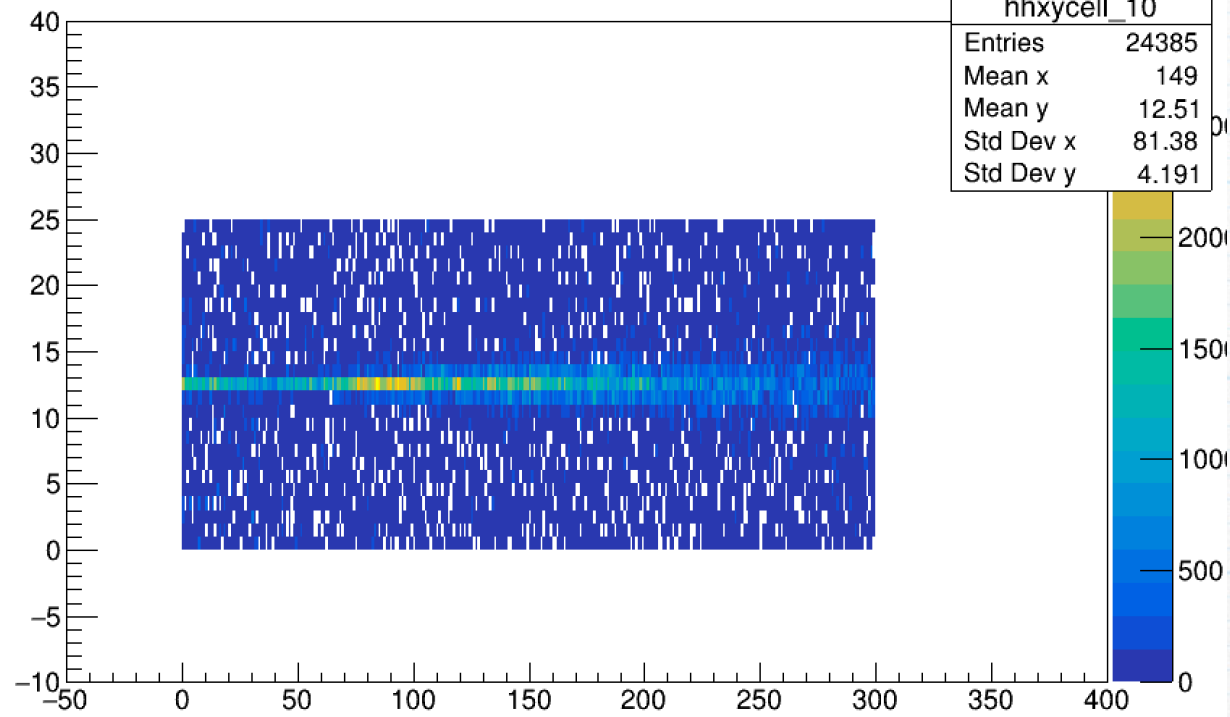
# Phase II, 16.5 GeV, 8 um, 941 BX



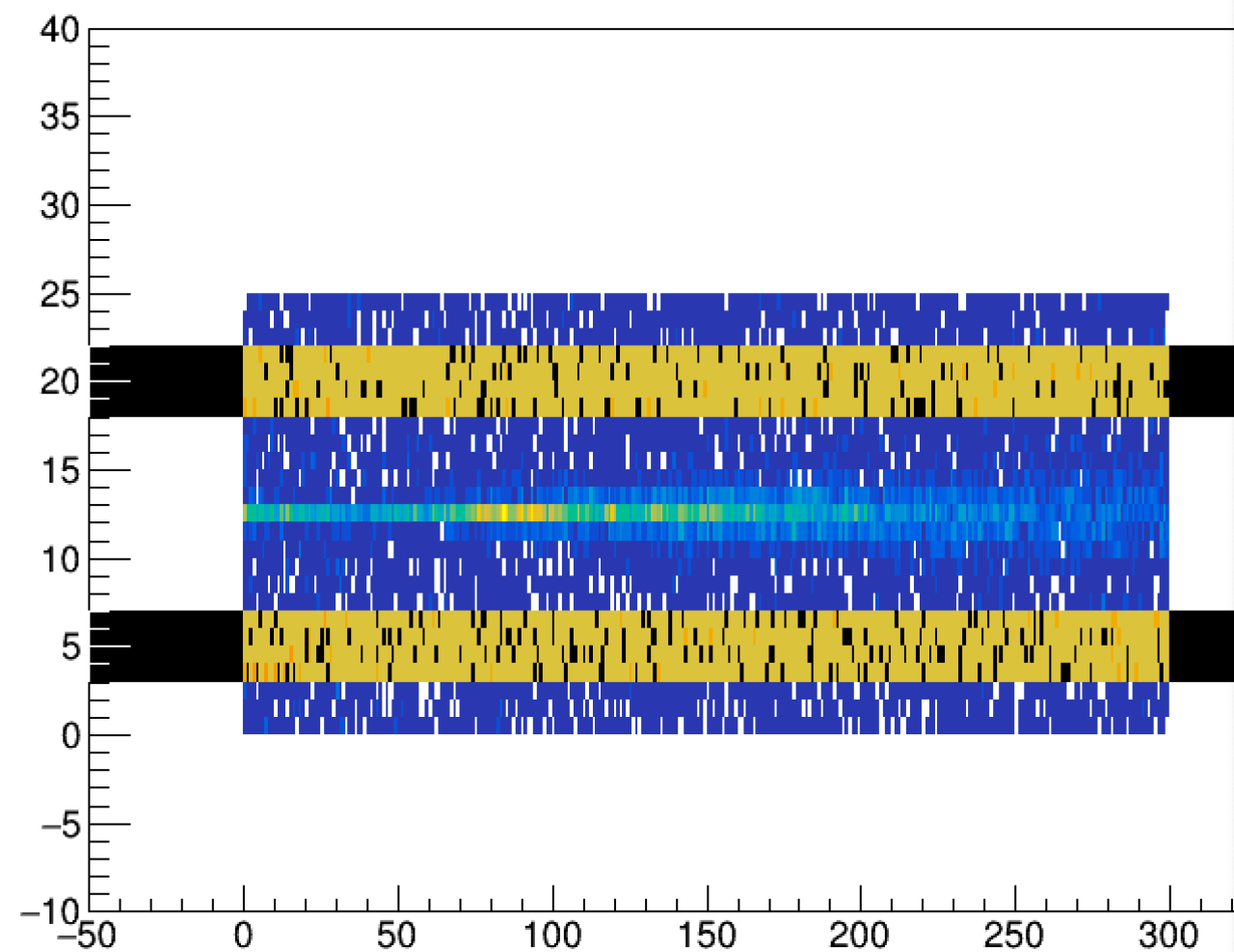
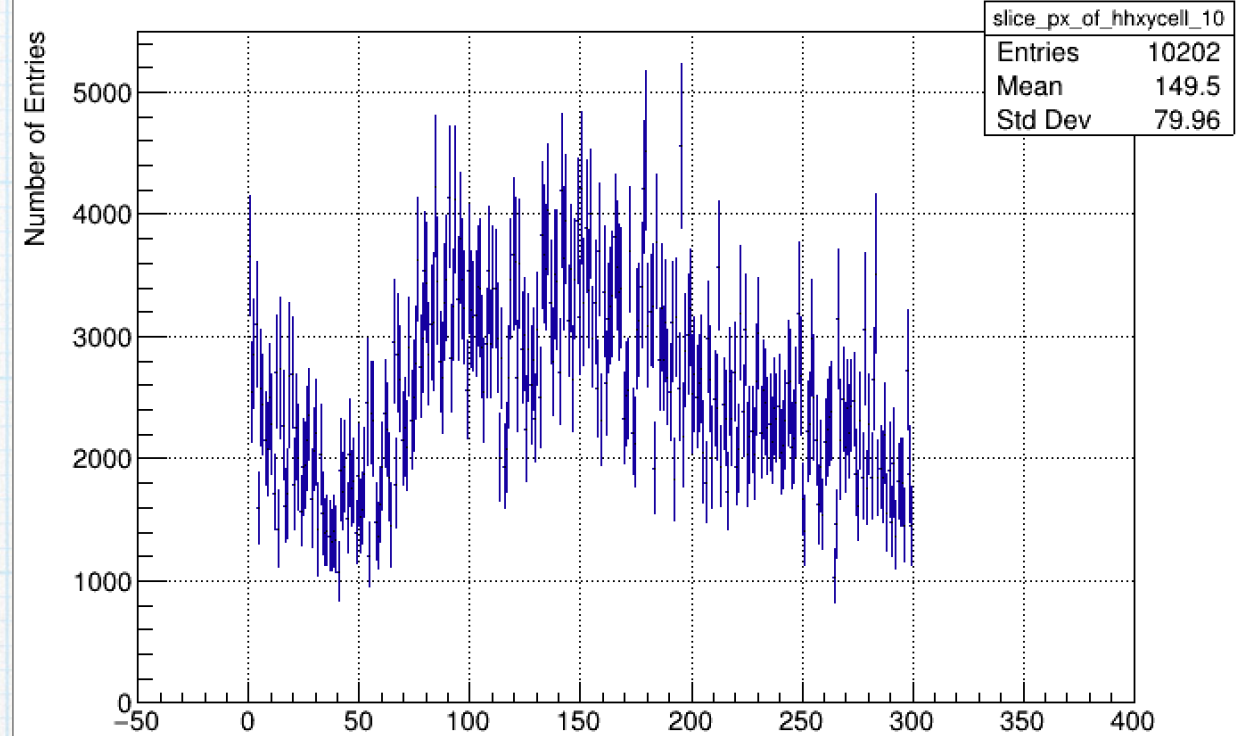
# \* Electron arm of Lanex Spectrometer



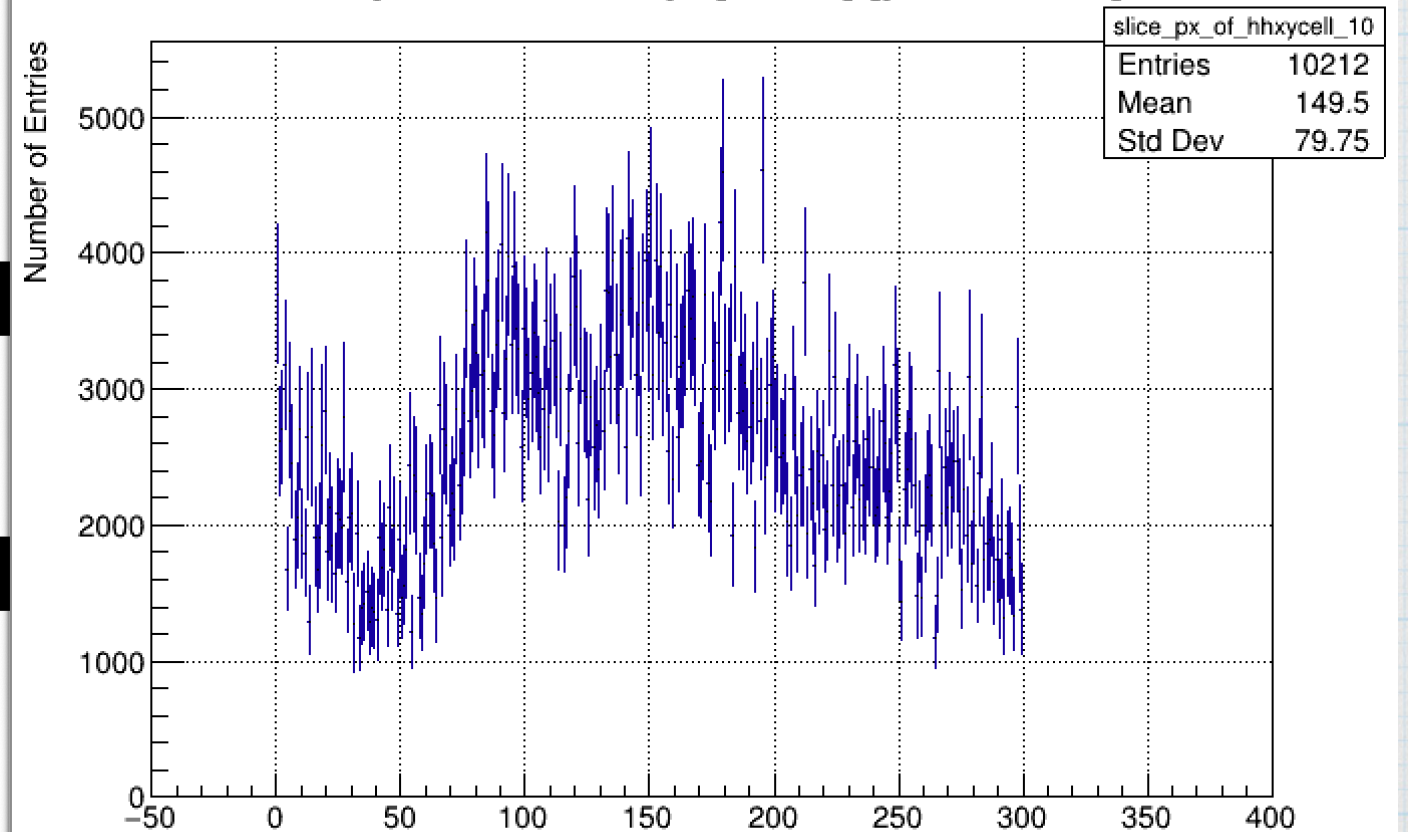
### hhxycell\_10



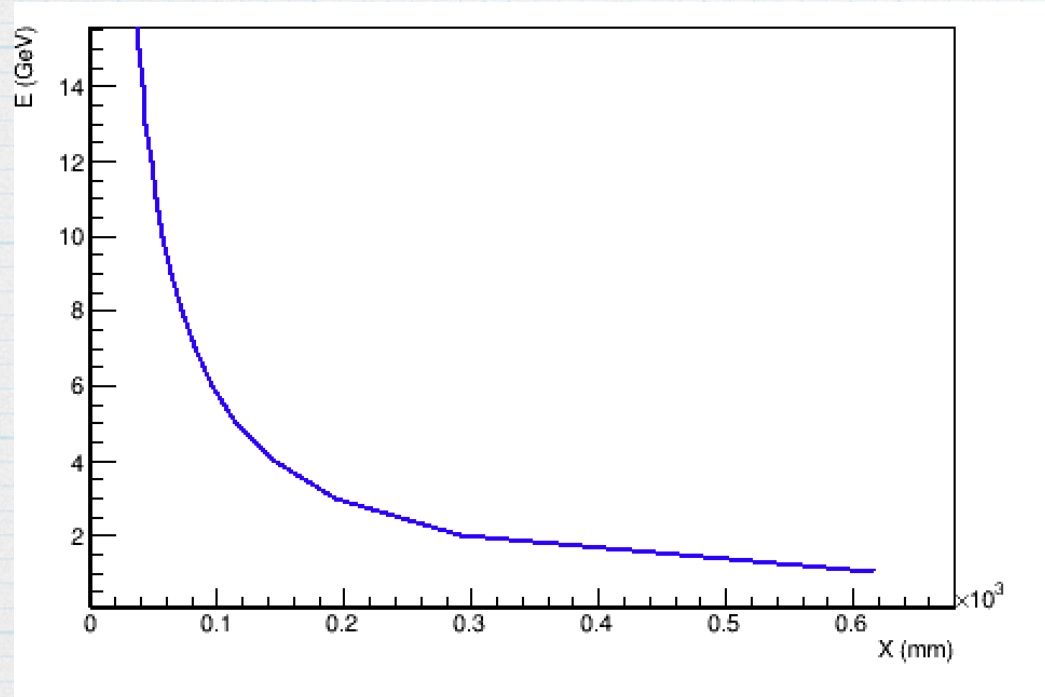
### ProjectionX of biny=[14,28] [y=3.0..18.0]



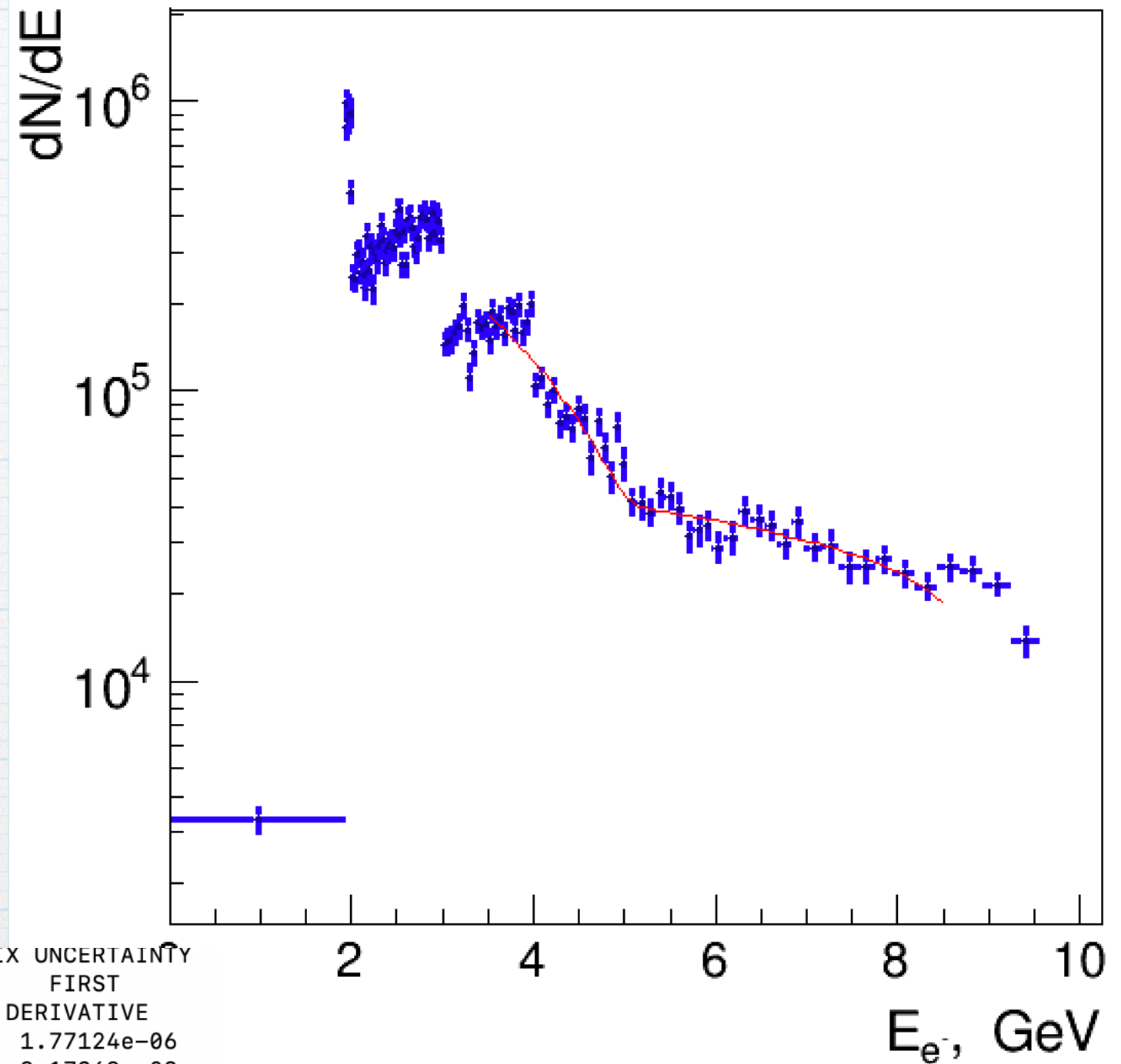
### ProjectionX of biny=[18,32] [y=7.0..22.0]



# Spectra reconstruction for the Lanex case



spectrum\_electron



| EXT NO. | PARAMETER NAME | EDM=3.45767  |                   | STRATEGY= 1  |                  | ERROR MATRIX |  | UNCERTAINTY |  |
|---------|----------------|--------------|-------------------|--------------|------------------|--------------|--|-------------|--|
|         |                | VALUE        | APPROXIMATE ERROR | STEP SIZE    | FIRST DERIVATIVE |              |  |             |  |
| 1       | p0             | -1.13129e+06 | 2.26562e+04       | -2.47452e-02 | 1.77124e-06      |              |  |             |  |
| 2       | p1             | 8.52709e+06  | 1.03972e+05       | 6.18410e-02  | -9.17369e-08     |              |  |             |  |
| 3       | p2             | 4.99979e+00  | 1.95217e-01       | 6.12022e-05  | -2.60964e+00     |              |  |             |  |
| 4       | p3             | 1.32018e+05  | 5.26539e+01       | -5.57651e-06 | 2.62956e-05      |              |  |             |  |
| 5       | p4             | -3.82289e+05 | 6.92345e+03       | 3.70539e-03  | -2.29557e-06     |              |  |             |  |
| 6       | p5             | 8.42734e+00  | 1.79782e-01       | -1.42424e-05 | 3.17284e+00      |              |  |             |  |
| 7       | p6             | 1.86312e+05  | 2.00261e+00       | -6.18804e-09 | 4.60353e-05      |              |  |             |  |
| 8       | p7             | 9.31179e+00  | 4.96505e-01       | 4.46513e-05  | -6.73901e-02     |              |  |             |  |
| 9       | p8             | 0.00000e+00  | 1.48007e+00       | -0.00000e+00 | 0.00000e+00      |              |  |             |  |