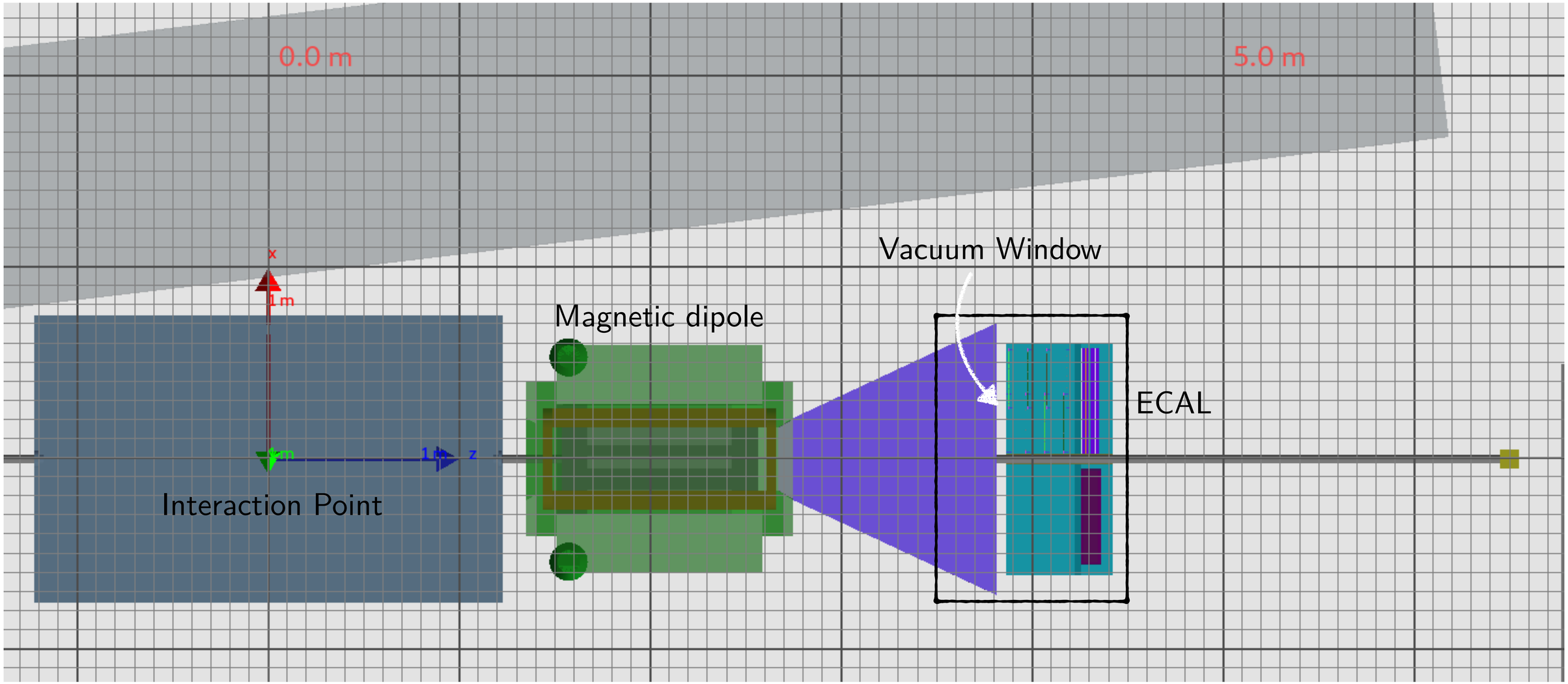
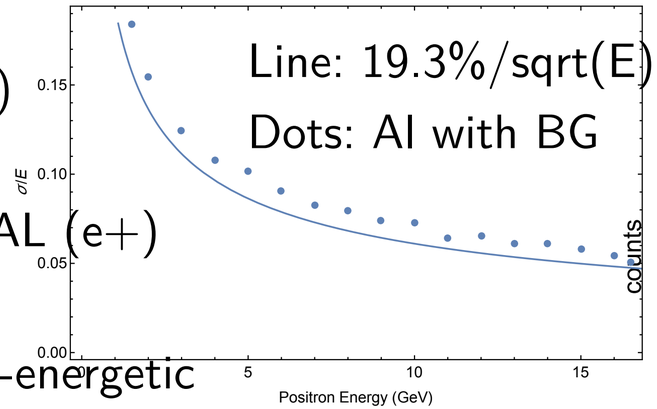
ECal background (Al window)

shan.huang@desy.de

27 May 2021

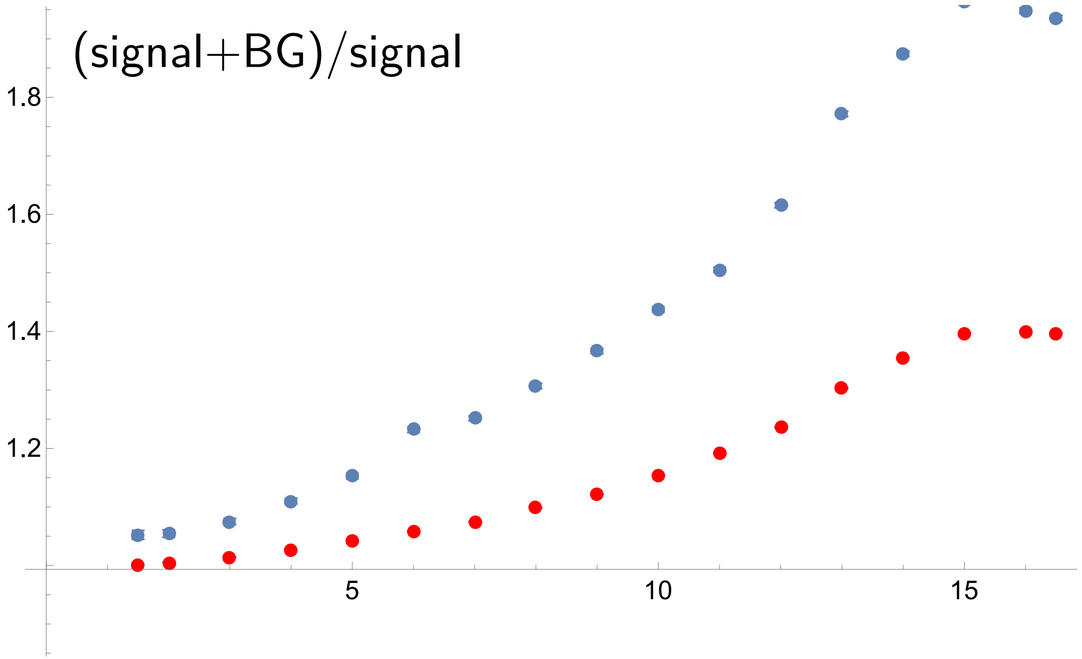

0.0 m
5.0 m
x
1 m
z
Interaction Point
Magnetic dipole
Vacuum Window
ECAL

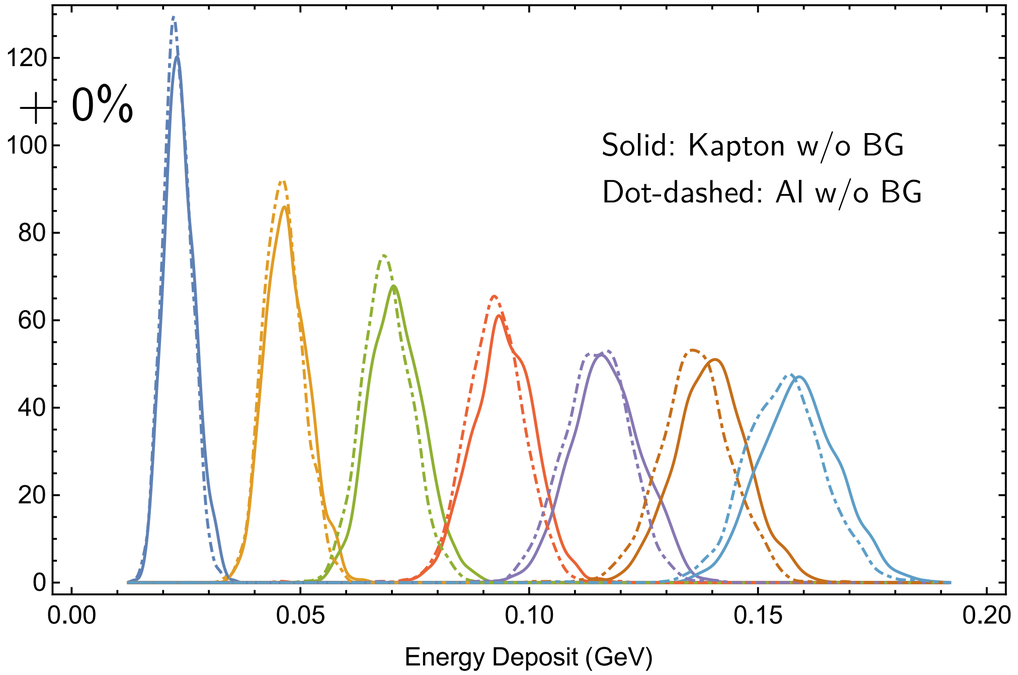
CDR Fig. 6.19a/6.20 (electron-laser)

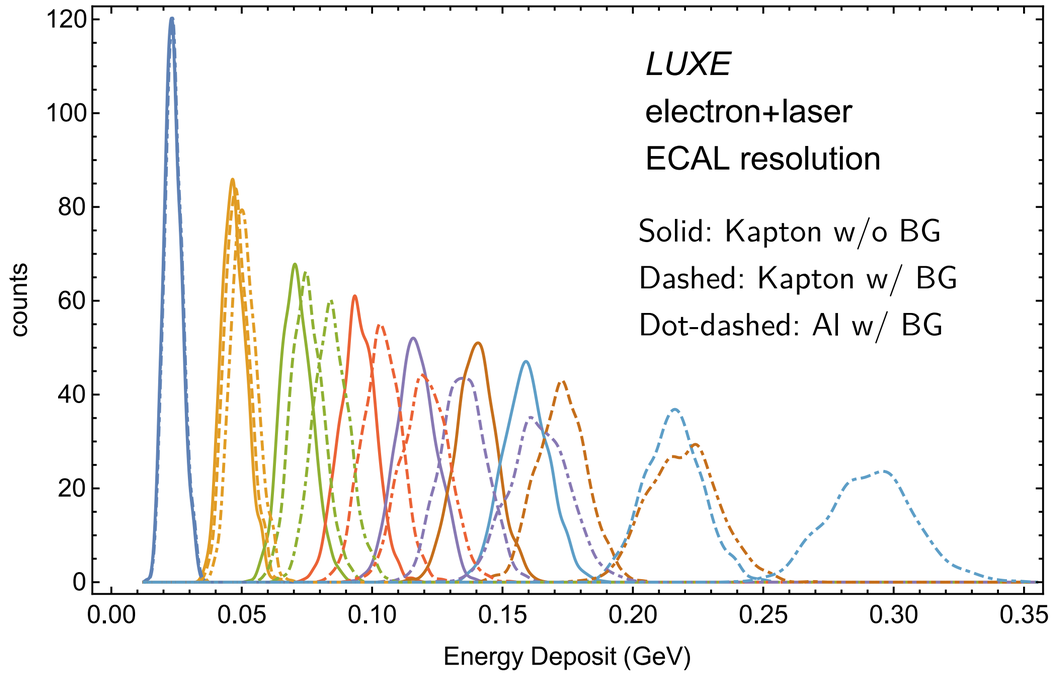


Energy deposit resolution of the ECAL (e+)
w/ or w/o BG particles

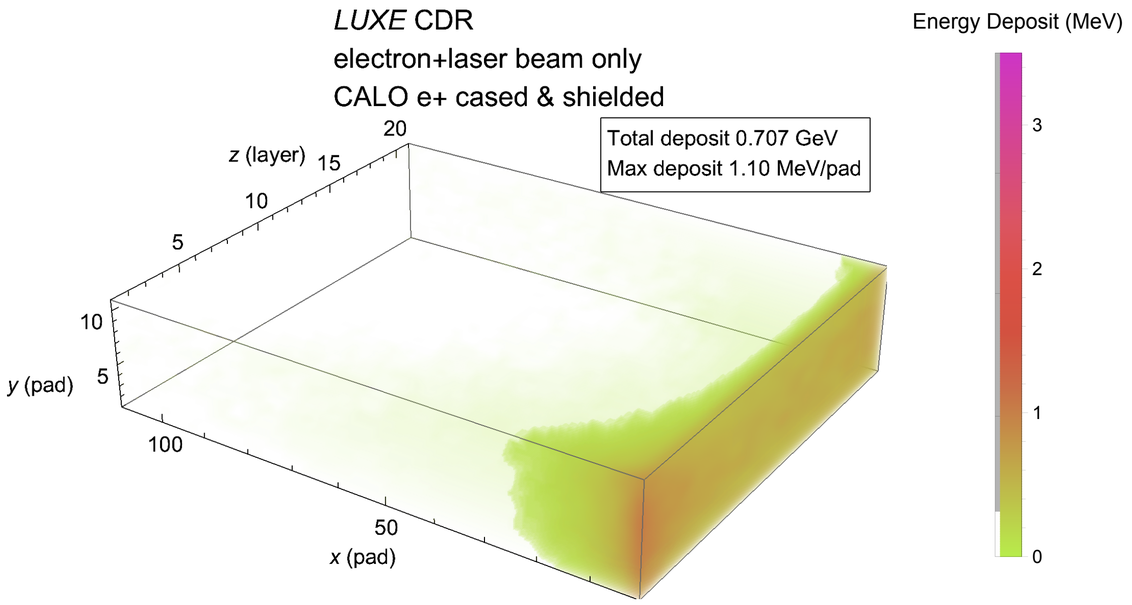
- Results obtained from 1000 mono-energetic positrons shooting from the IP
- BG are added only on the pad with signal



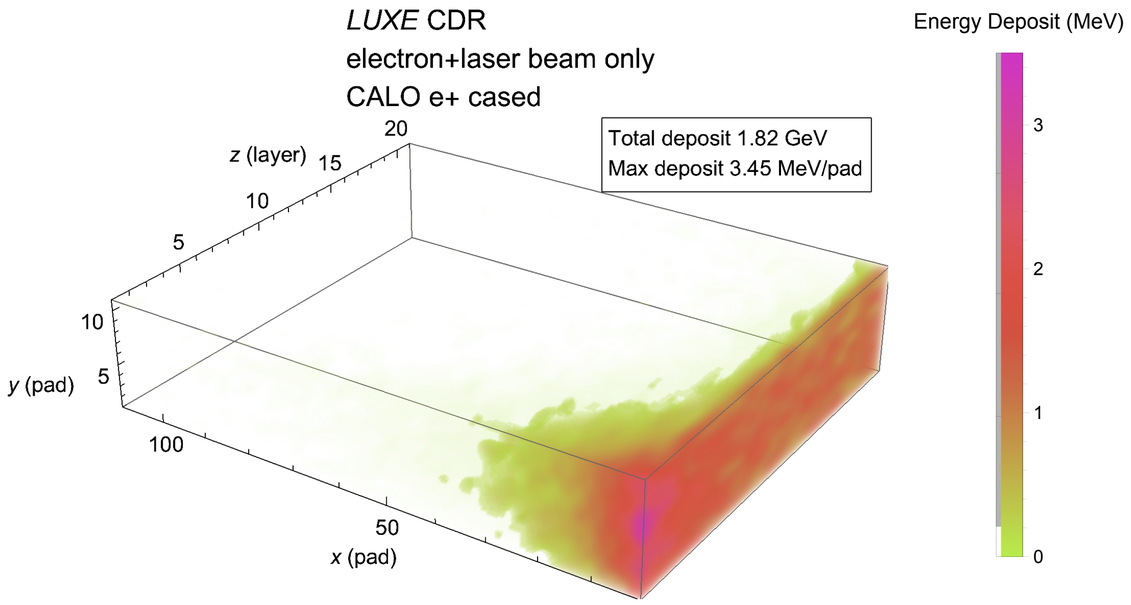




Energy Deposit in ECAL

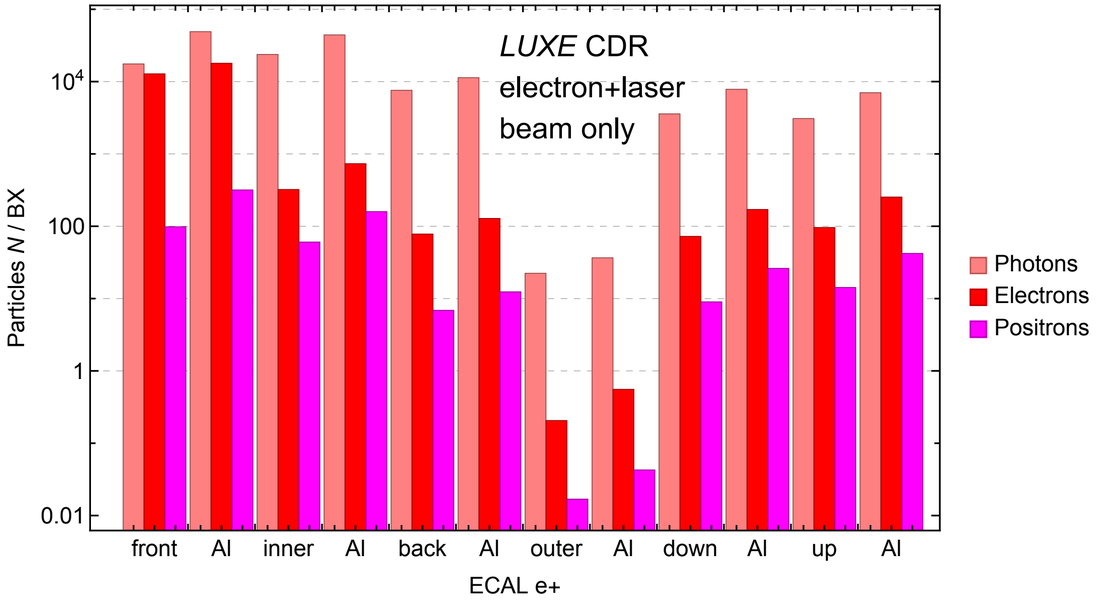


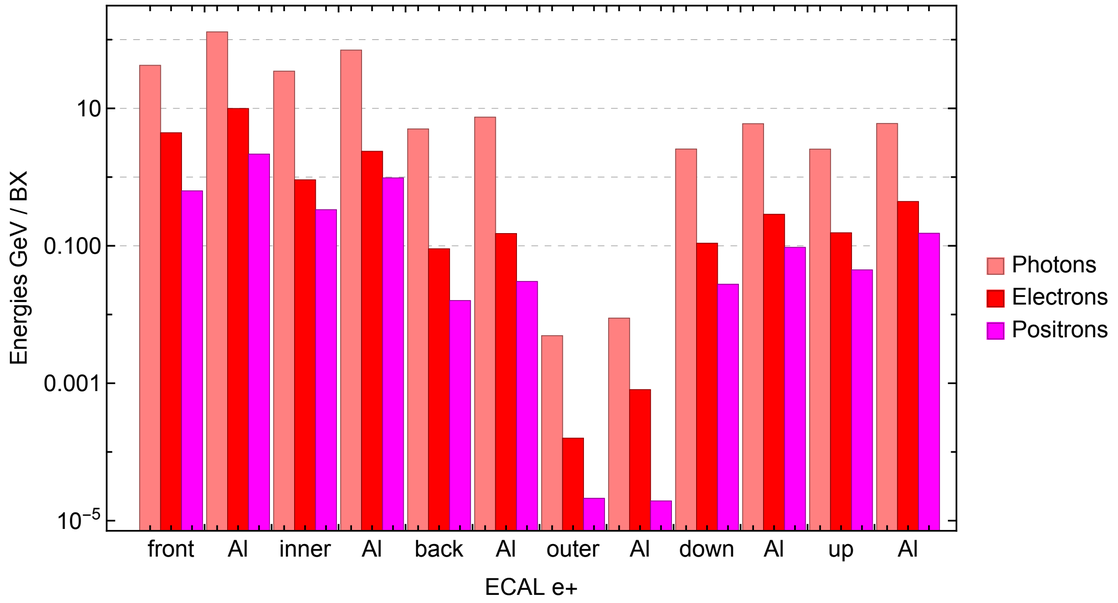
Kapton

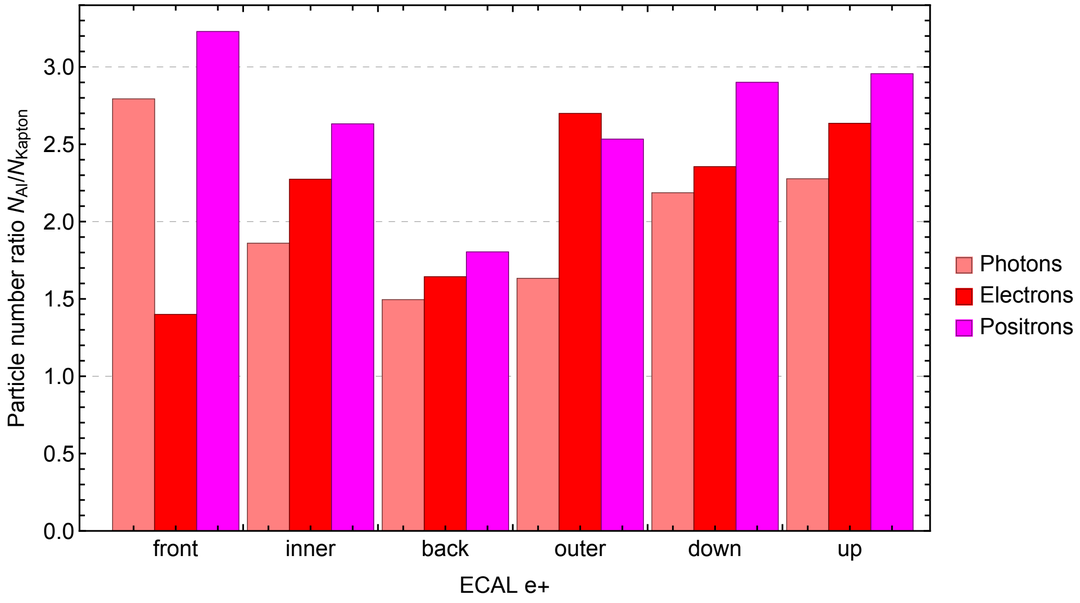


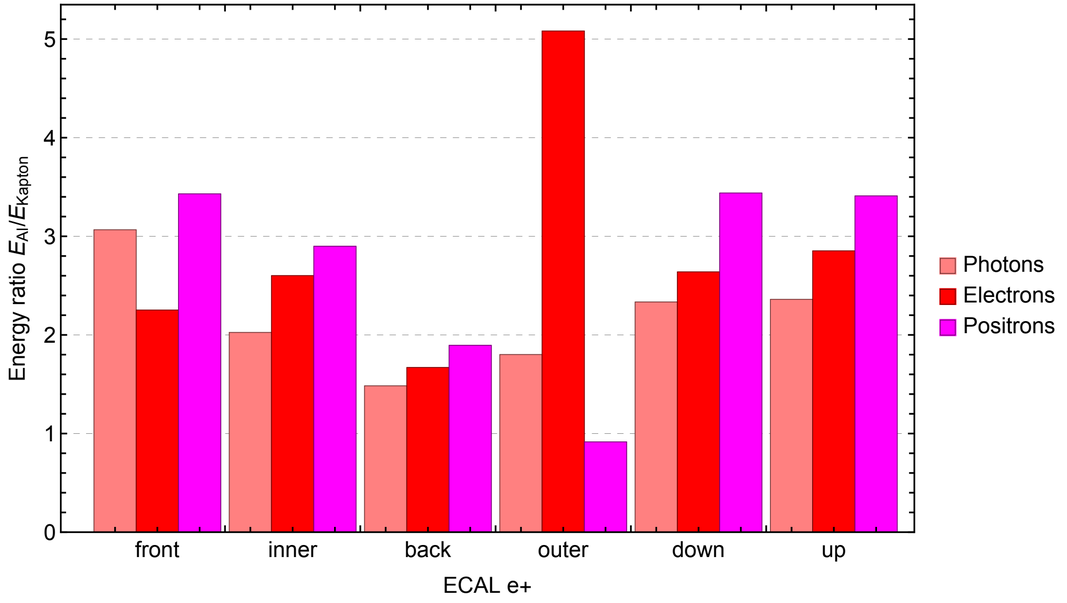
Al

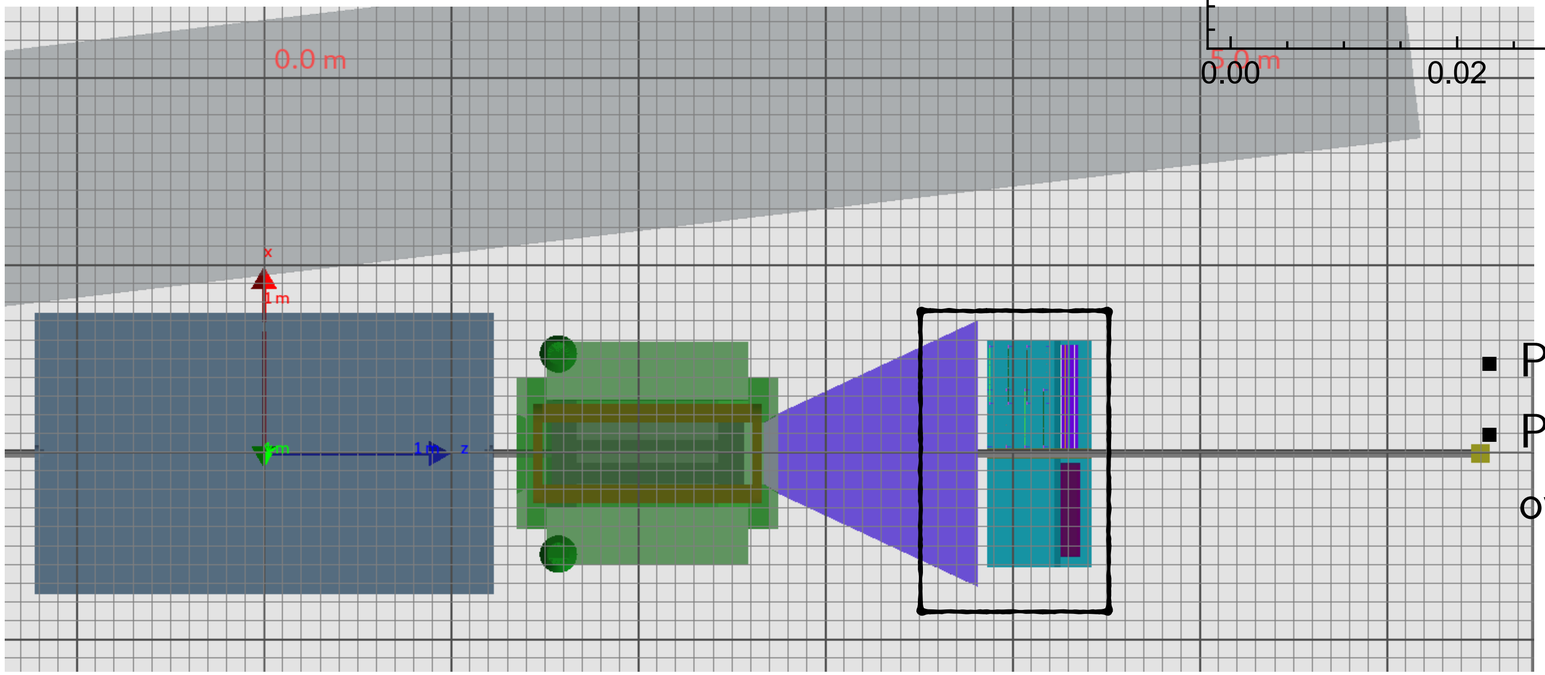
- Total Edep rises to 2.6 times
- Peak Edep rises to 3.1 times
- For signal, ECAL occupancy increased, but not significantly

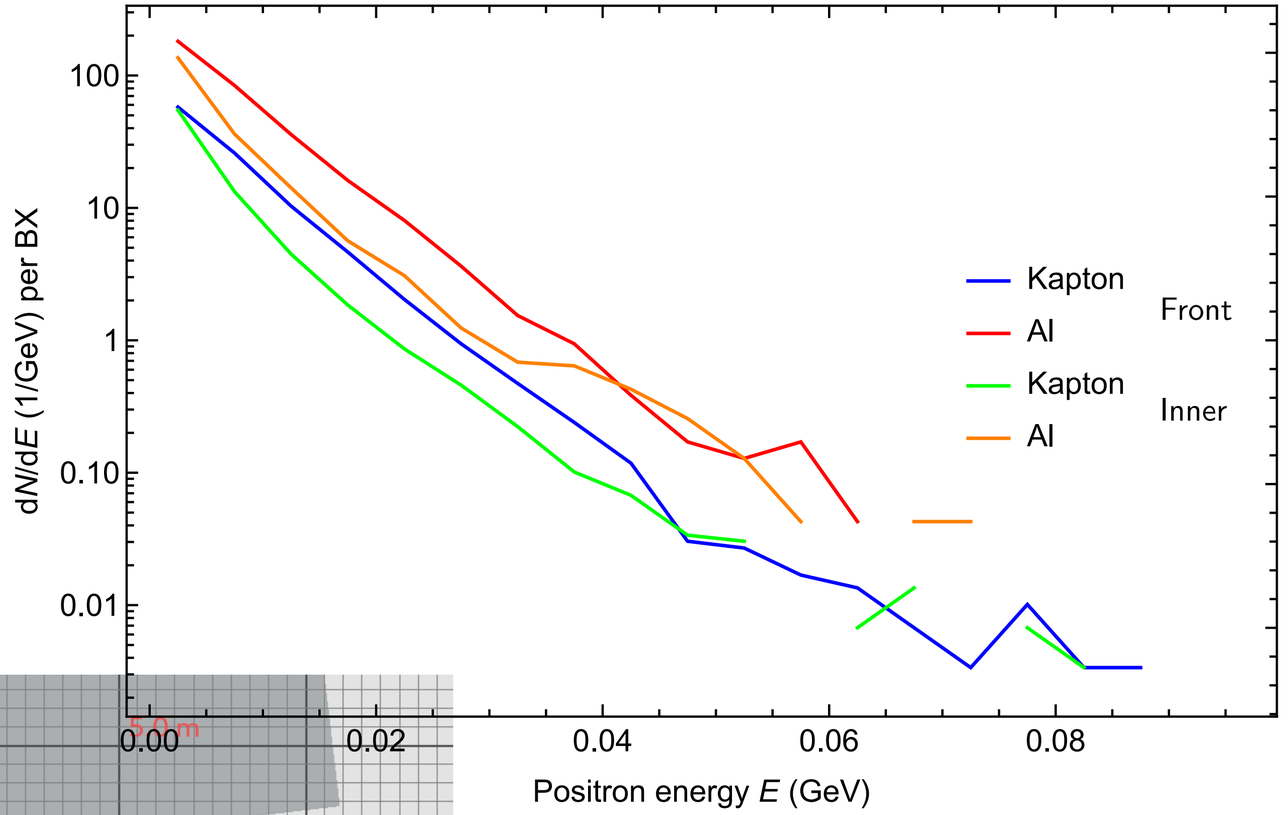

LUXE CDR
electron+laser
beam only
Particles *N* / BX
10^4
100
1
0.01
front
Al
inner
Al
back
Al
outer
Al
down
Al
up
Al
ECAL e+
Photons
Electrons
Positrons


Energies GeV / BX
10
0.100
0.001
10^{-5}
front
Al
inner
Al
back
Al
outer
Al
down
Al
up
Al
ECAL e+
Photons
Electrons
Positrons


Particle number ratio N_{Al}/N_{Kapton}
3.0
2.5
2.0
1.5
1.0
0.5
0.0
front
inner
back
outer
down
up
ECAL e+
Photons
Electrons
Positrons

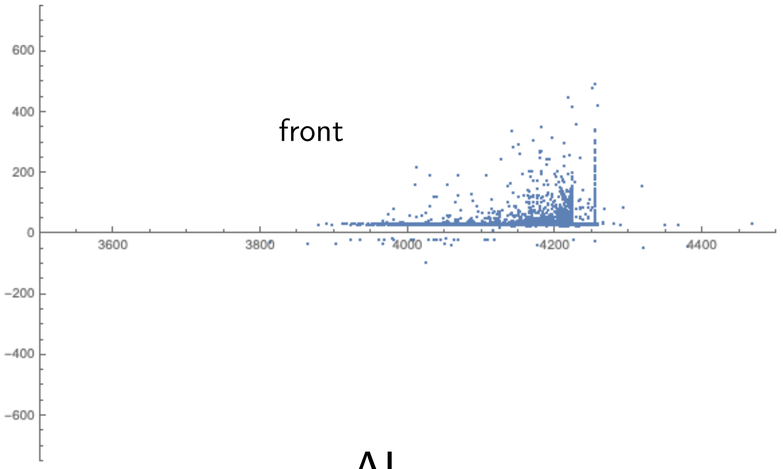

Energy ratio E_{Al}/E_{Kapton}
5
4
3
2
1
0
front
inner
back
outer
down
up
ECAL e+
Photons
Electrons
Positrons



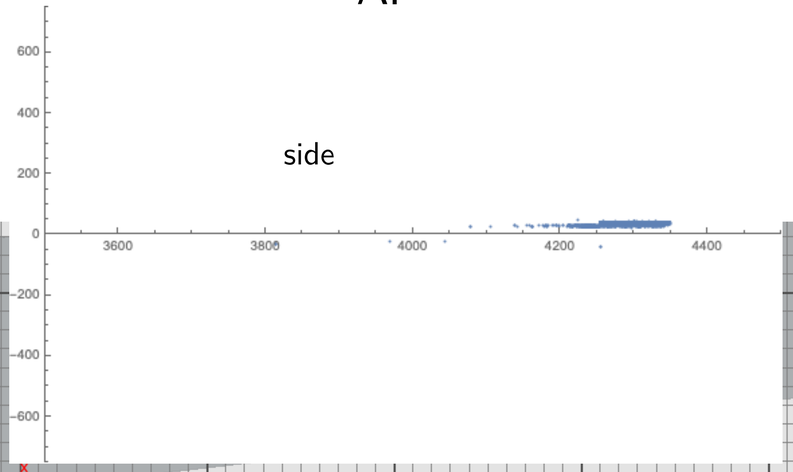


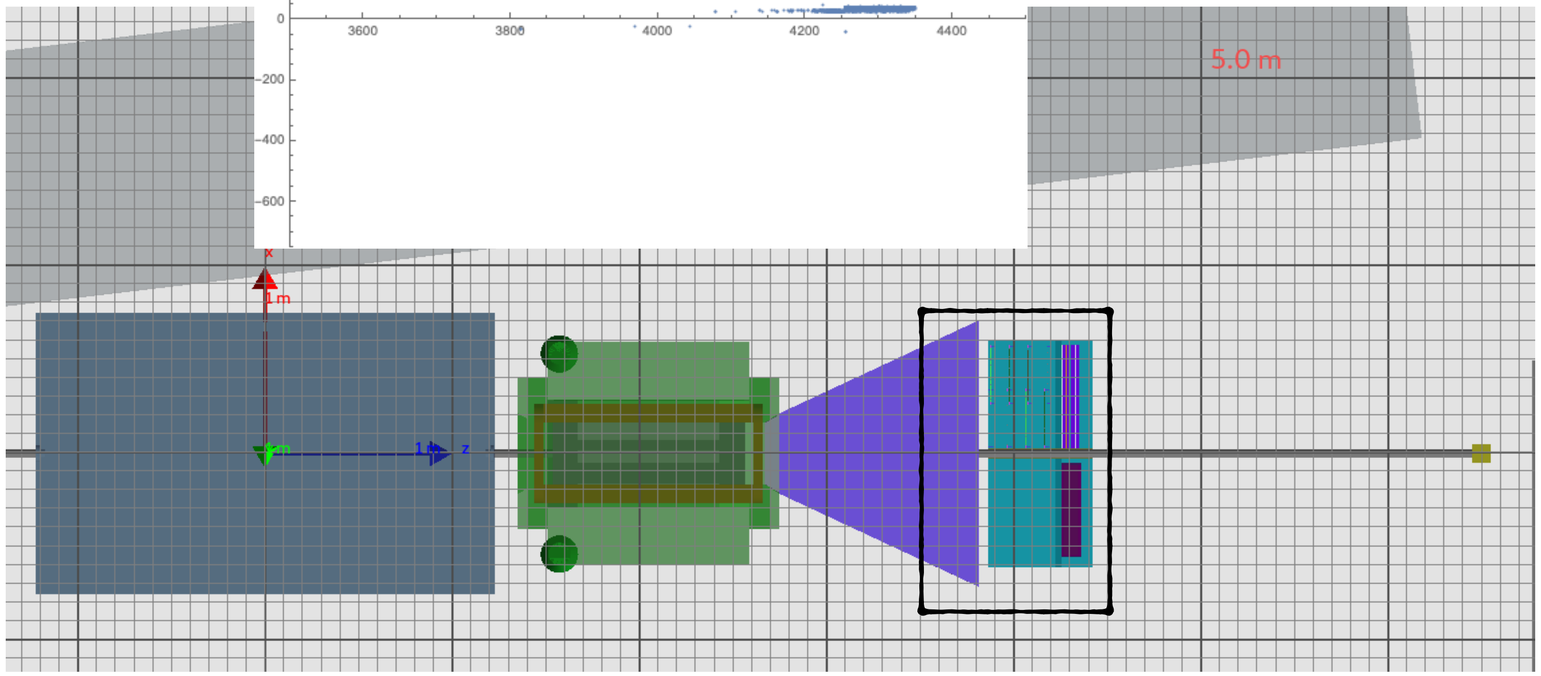
- Peak energy went down for new window
- Particle number “uniformly” increased over “low”-energy region

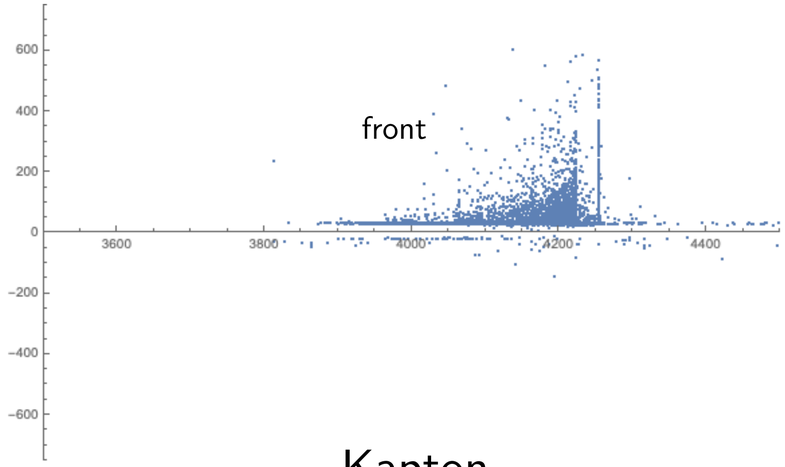
Positron vertex point plot



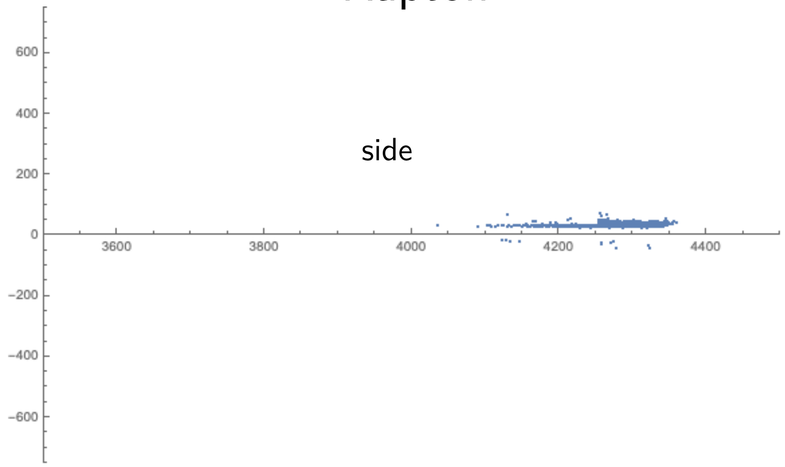
Al



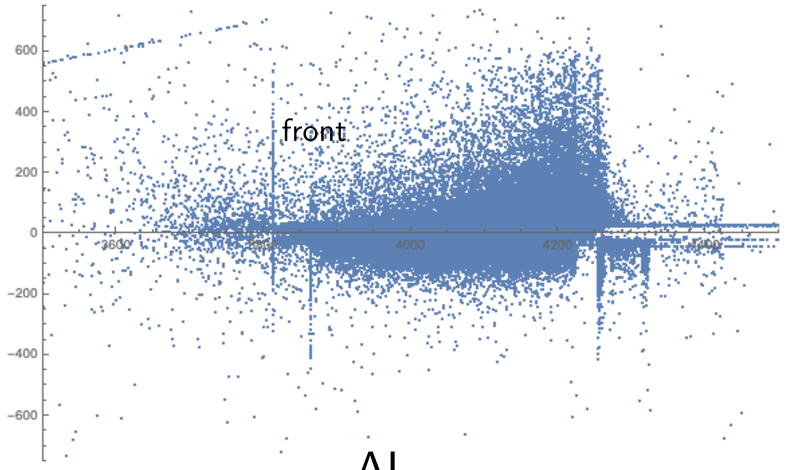




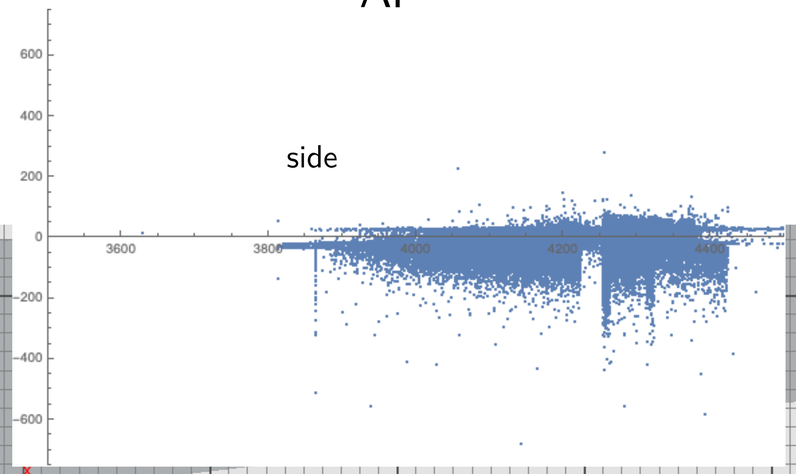
Kapton

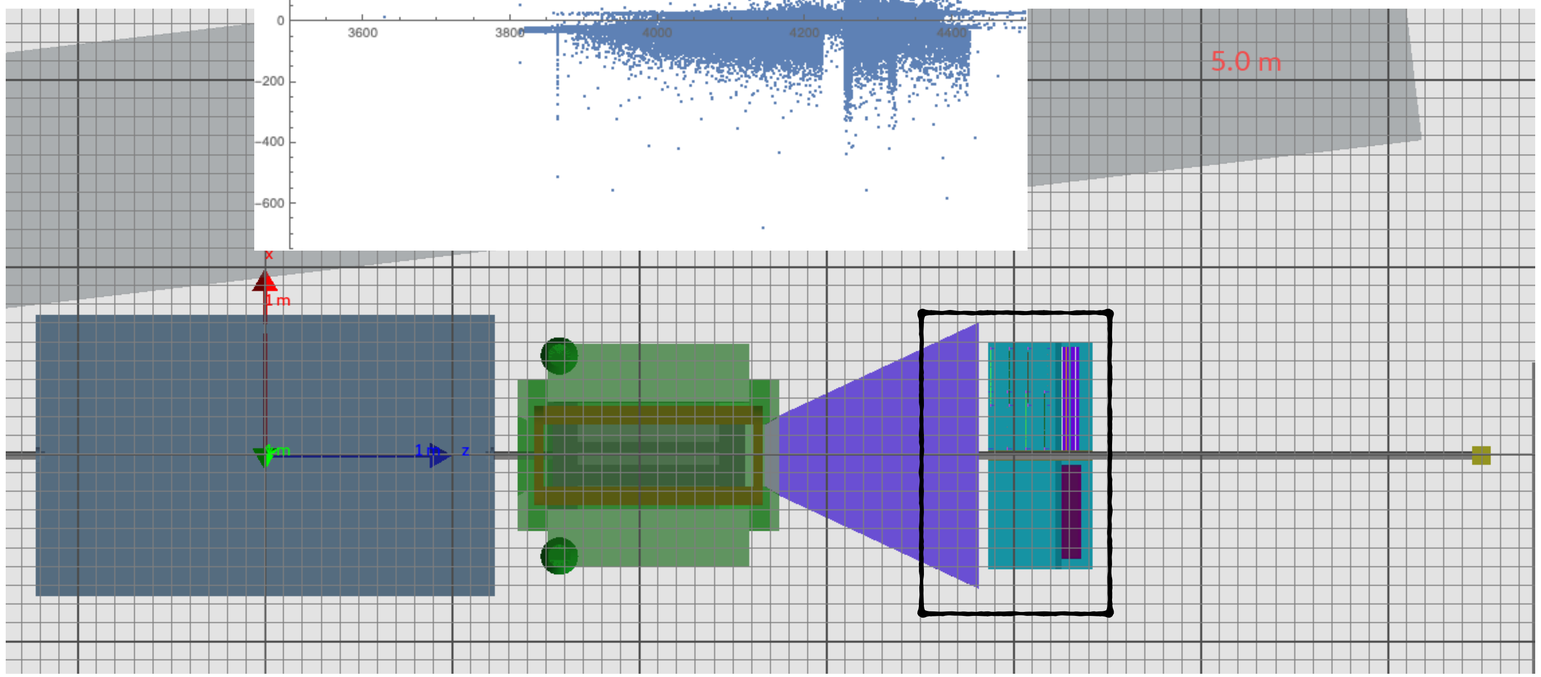


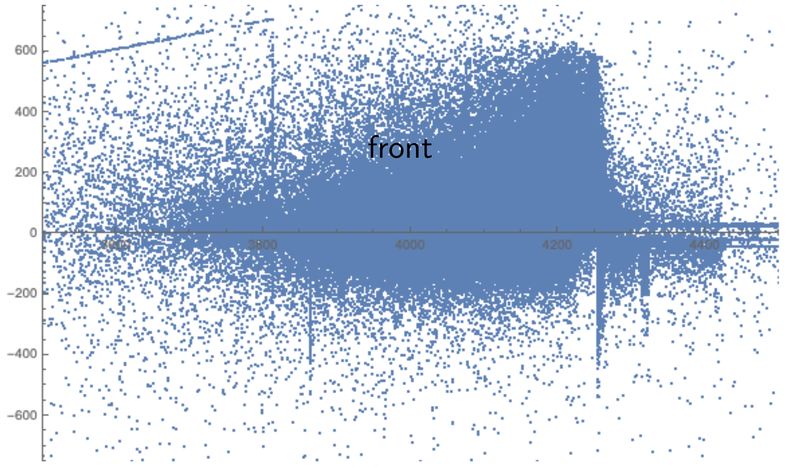
Photon vertex point plot



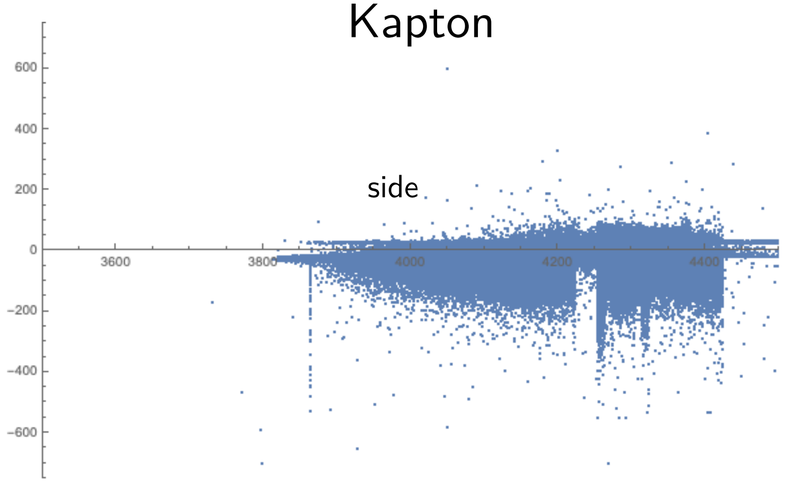
Al

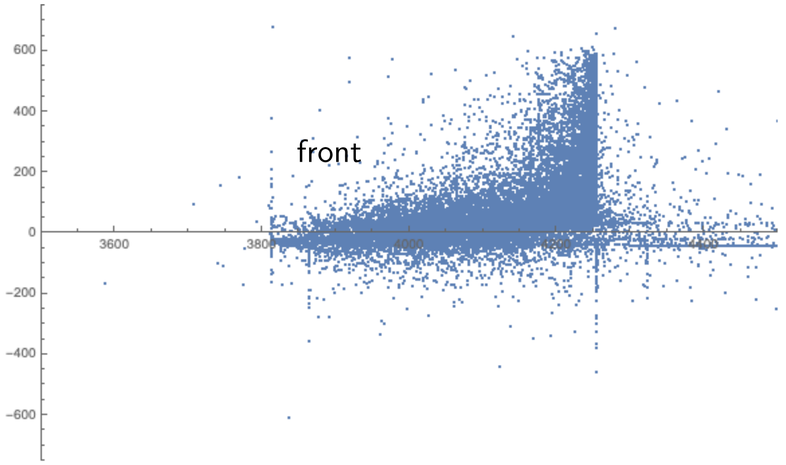




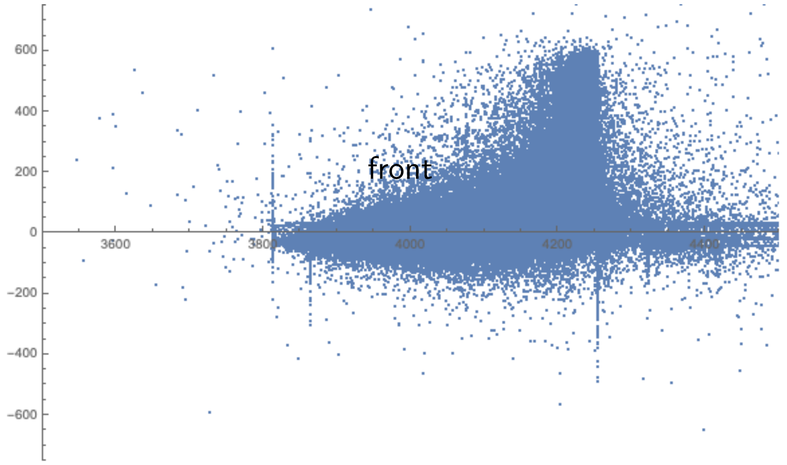


Kapton





Electron vertex point plot



Al

Kapton