Target for the forward photon detector system

Borysova Maryna (KINR)

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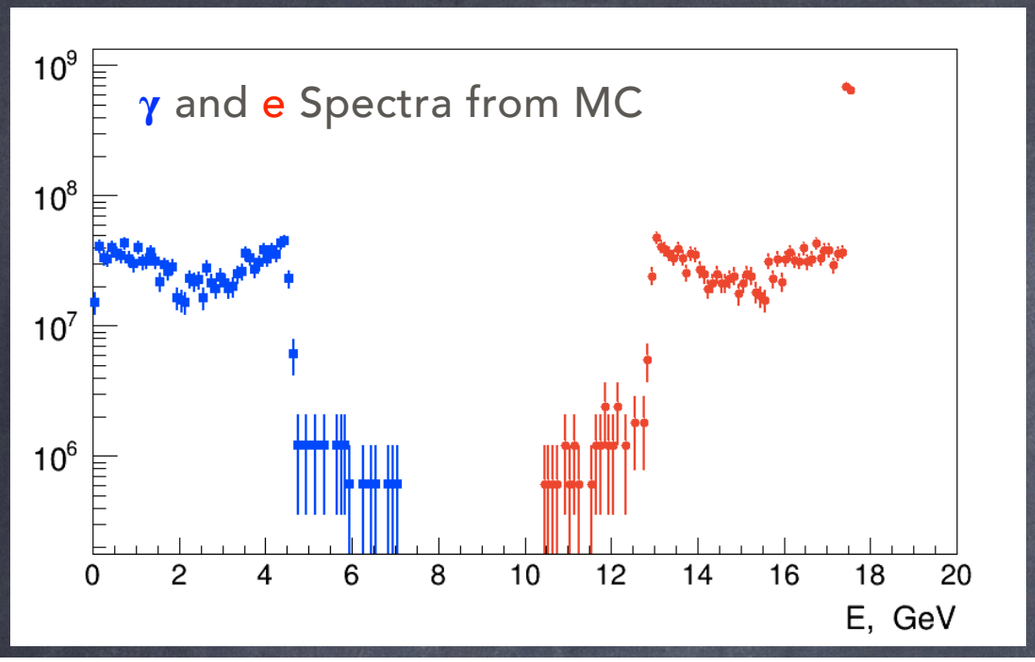
LUXE weekly technical meetings

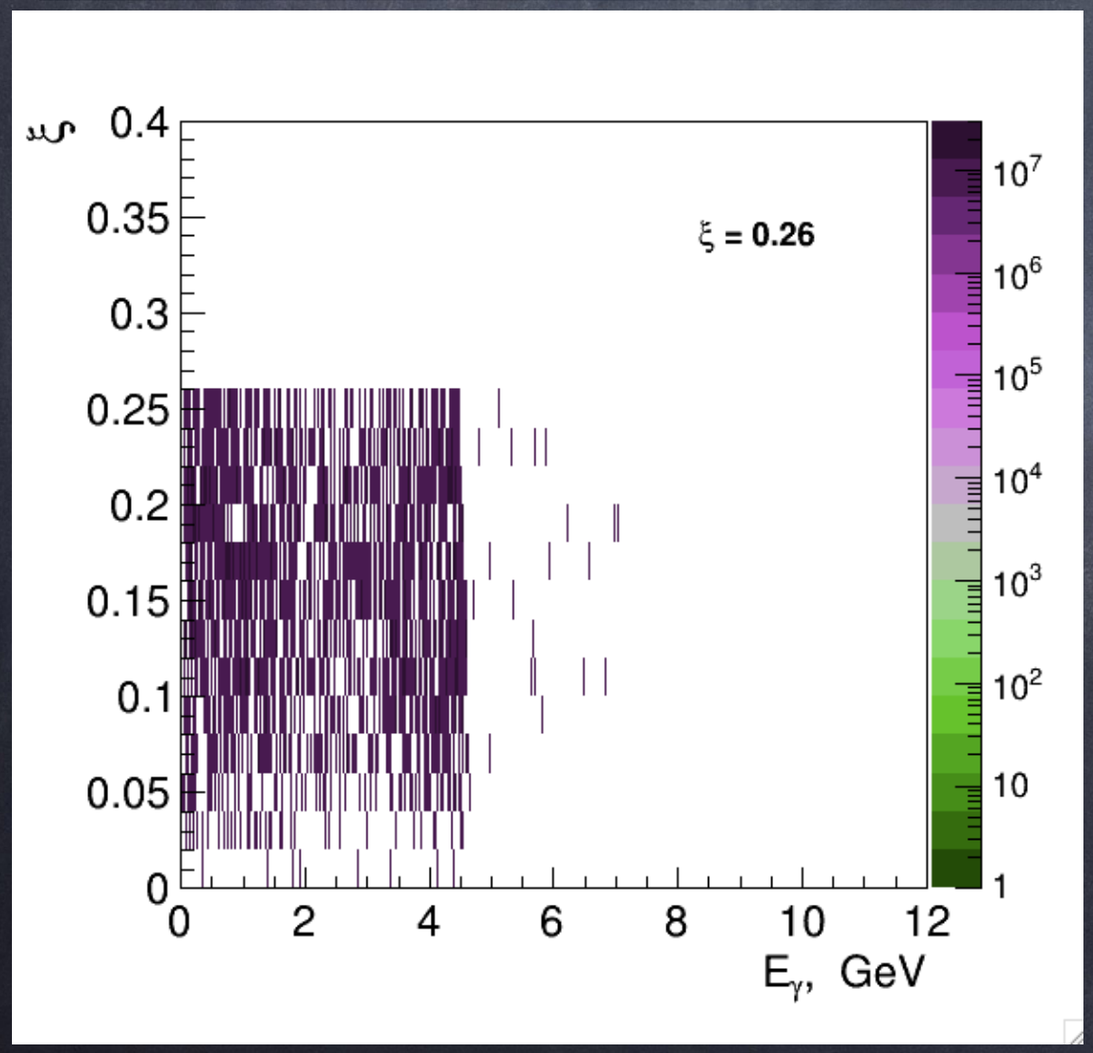
LUXE

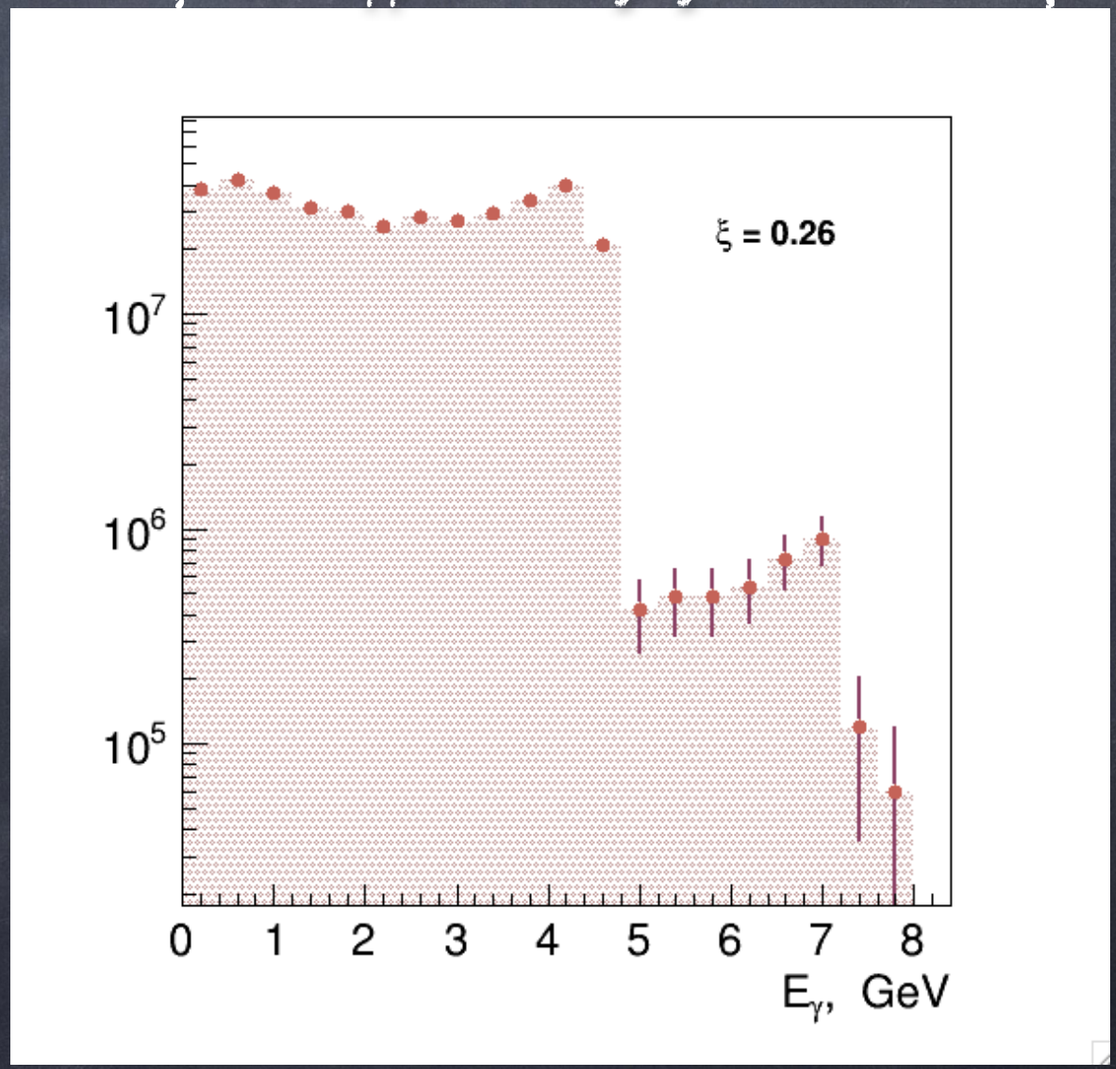
ξ vs Eγ FROM MC



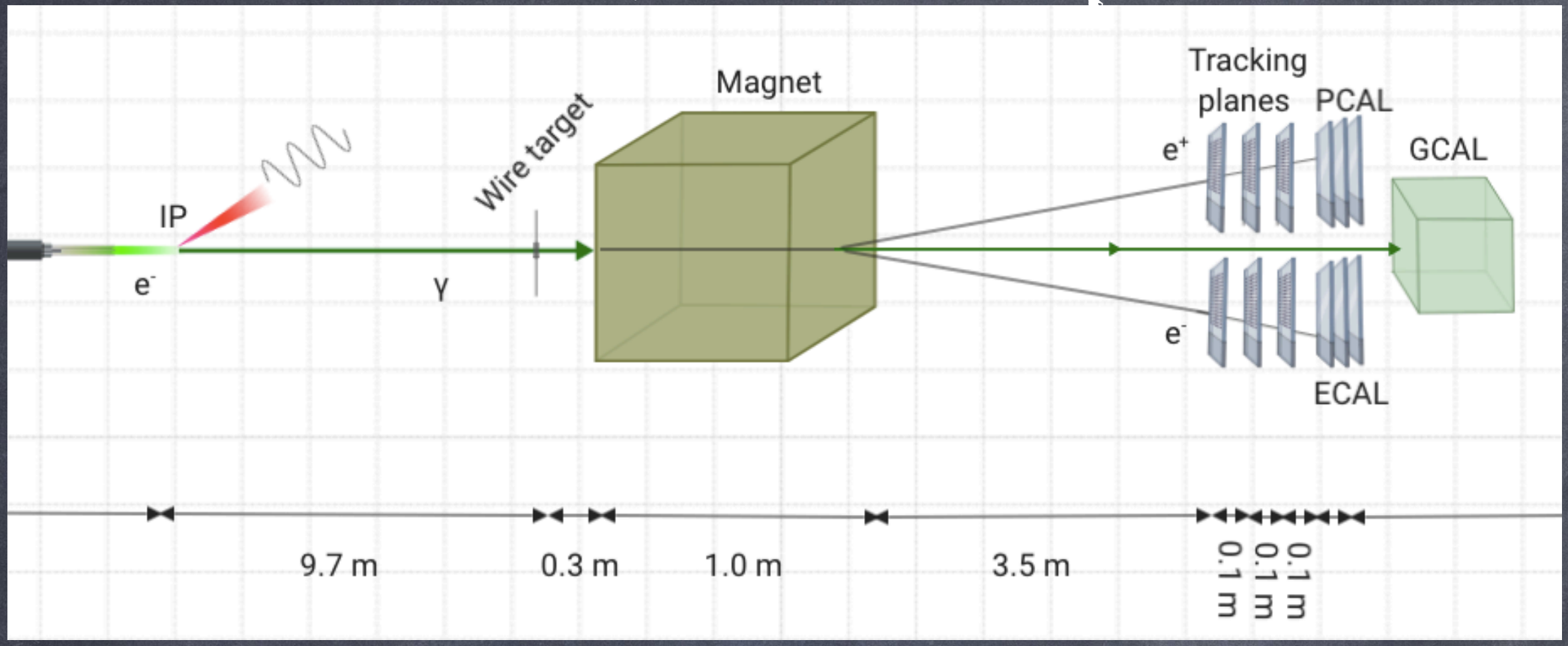
Peak ξ = 0.26 (0.01 J)
10000 bunches

For 800 nm laser, 17.5 GeV electrons:
Compton edge ~ 5.14 GeV
the first kinematic edge is shifted
approximately by 200 MeV

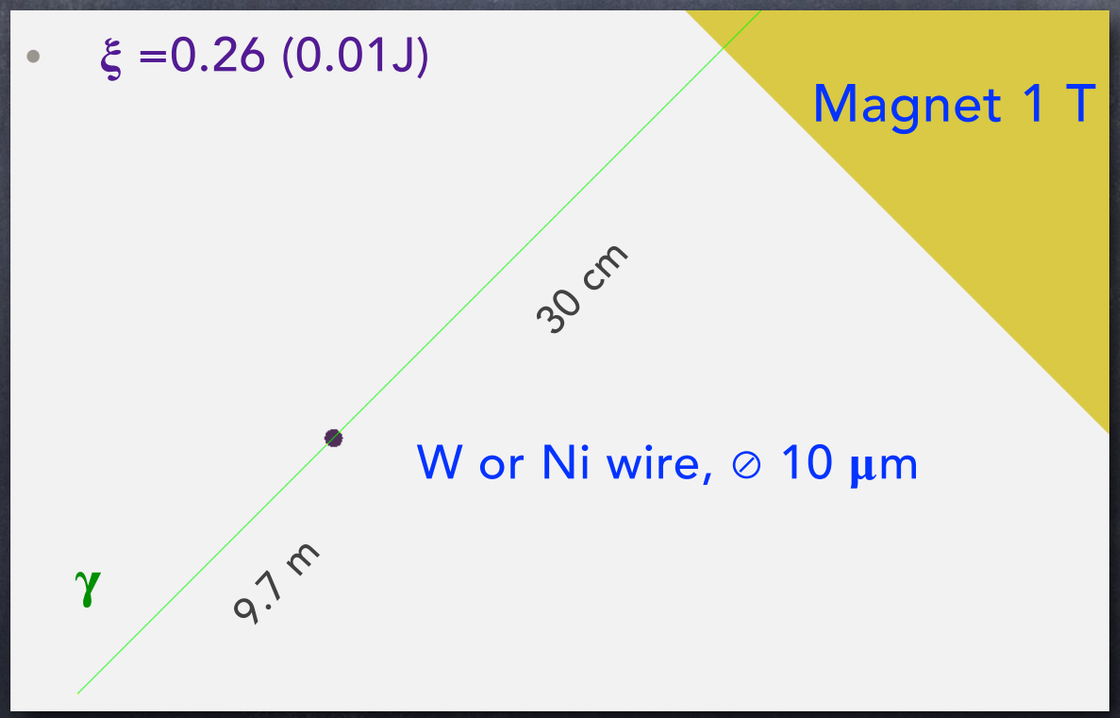




Schema of the experiment



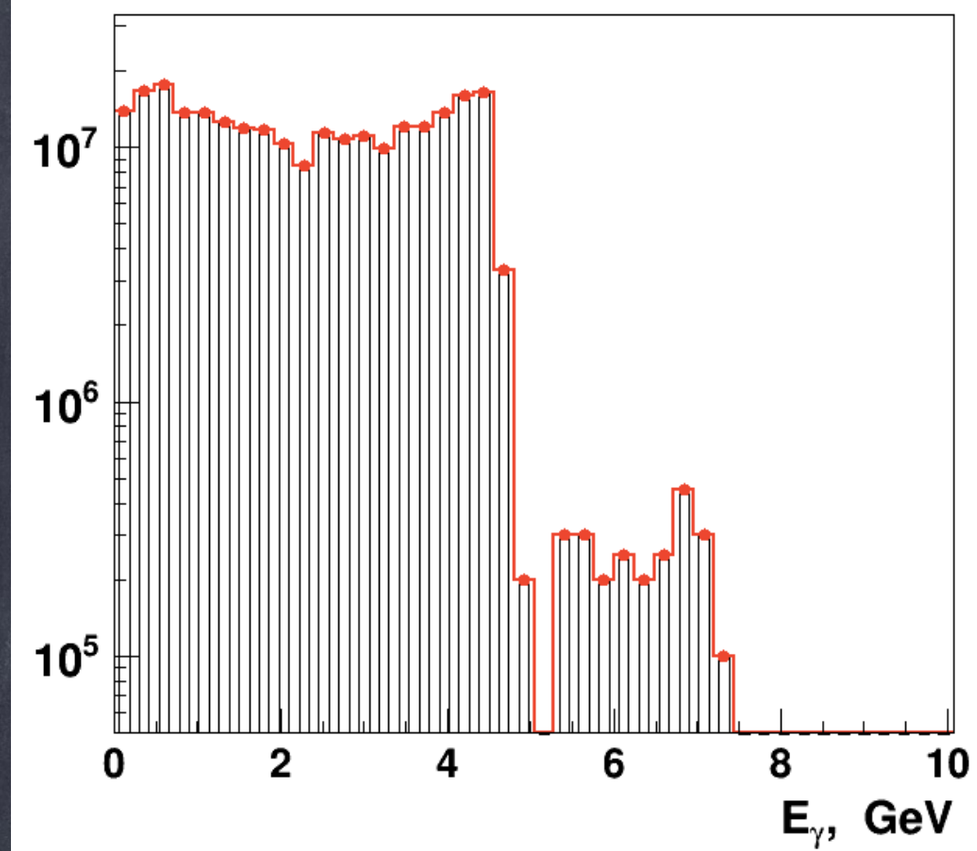
- ξ =0.26 (0.01J)

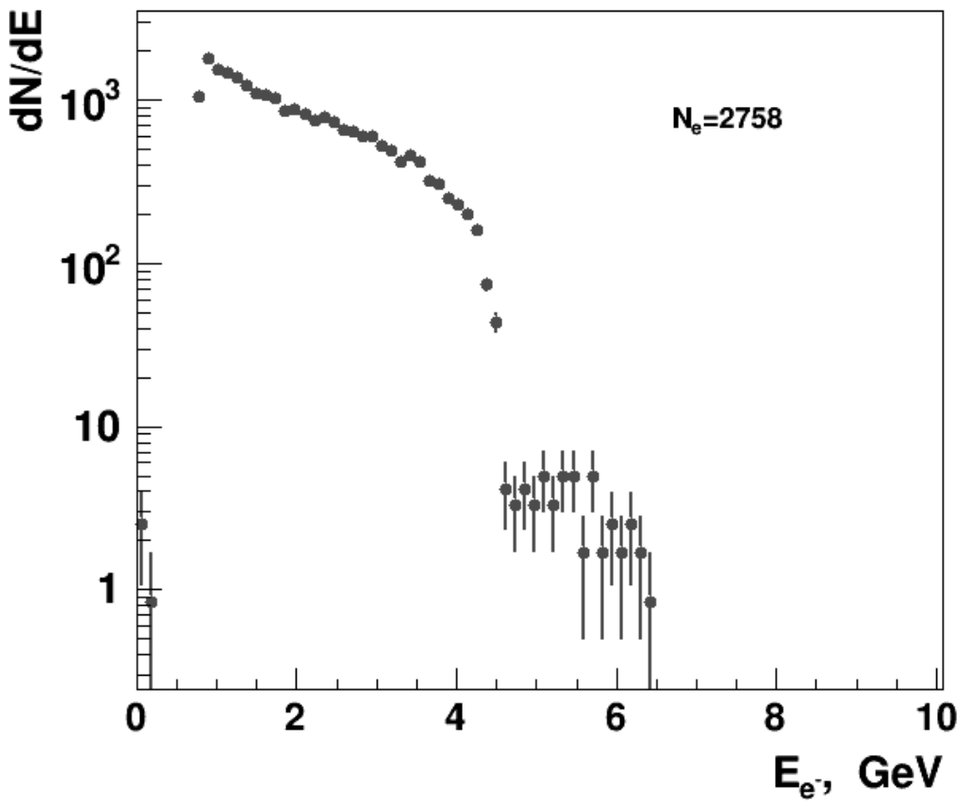


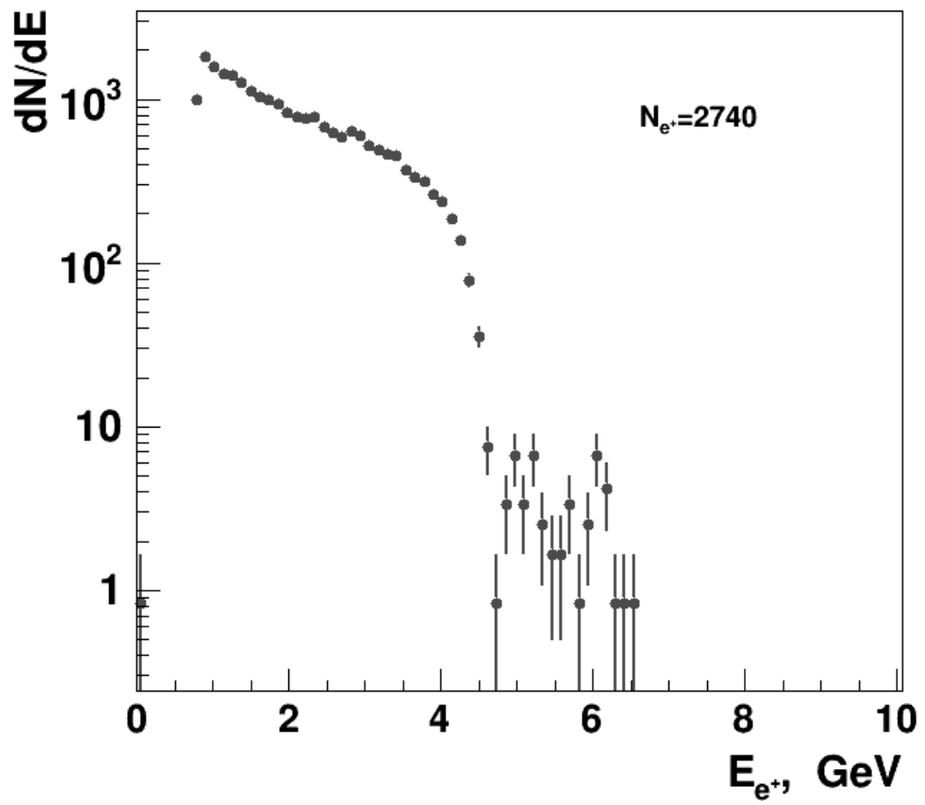
Geant4 simulation for the W wire converter

1000 BX

W thickness 10 um

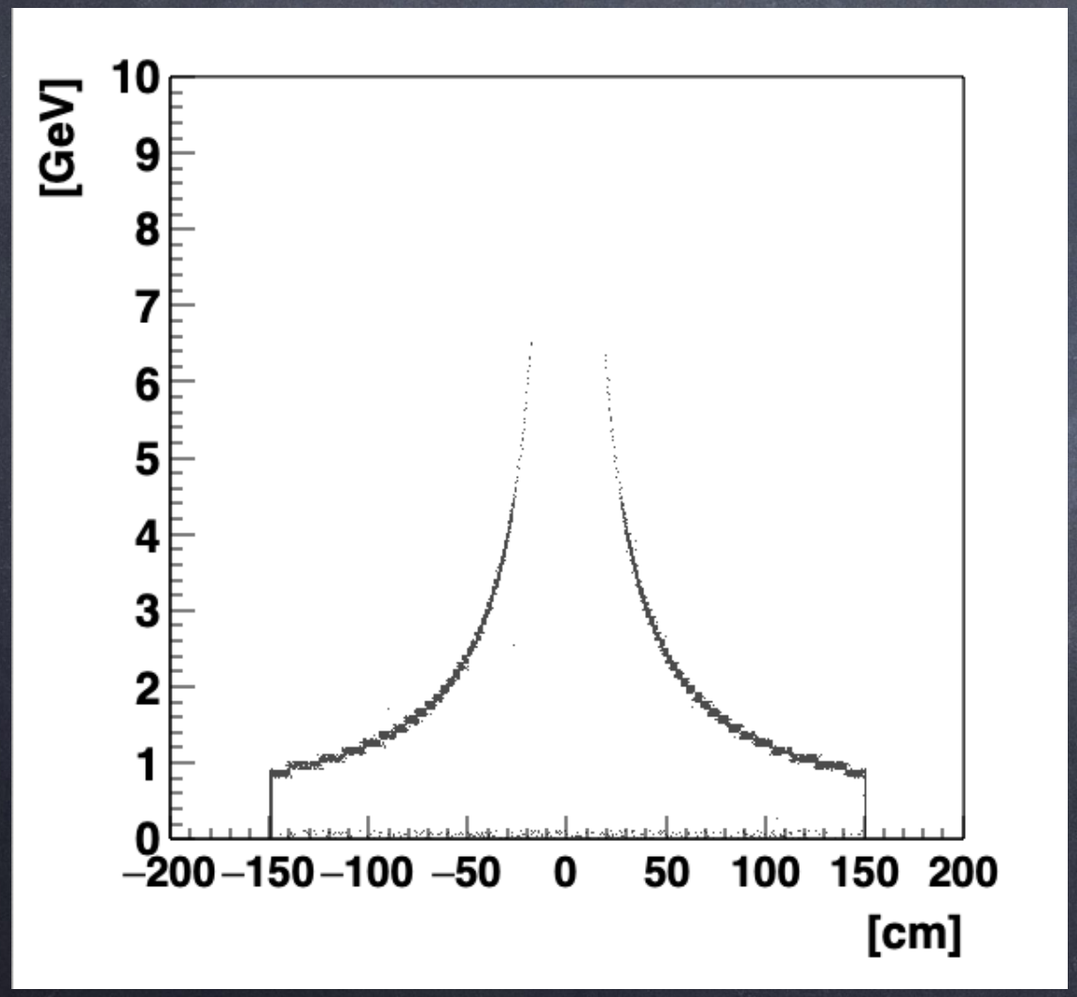


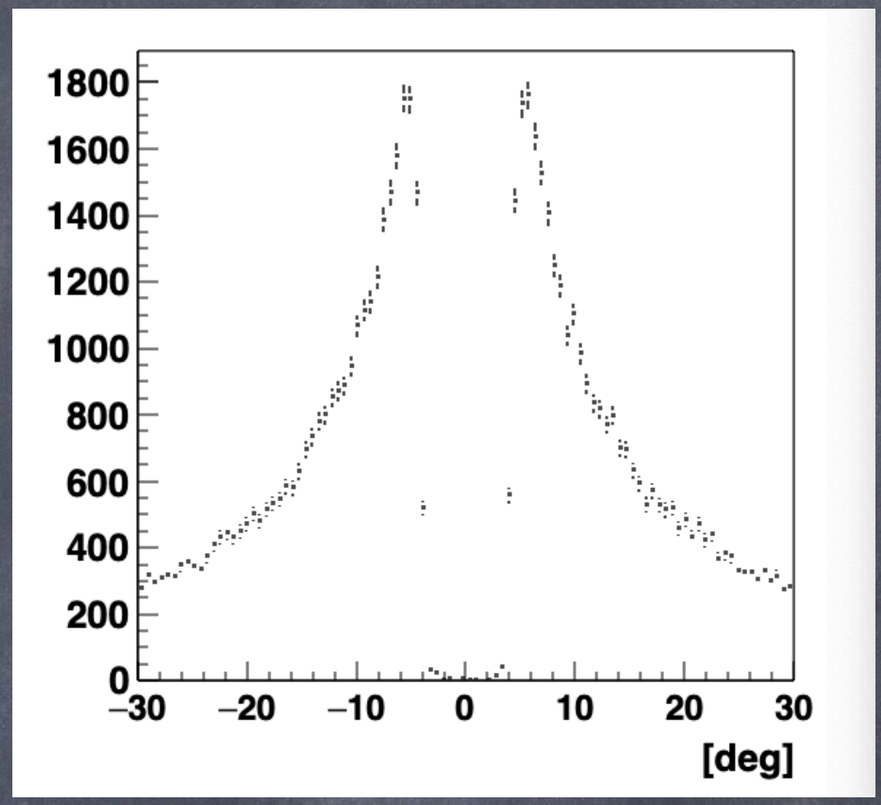


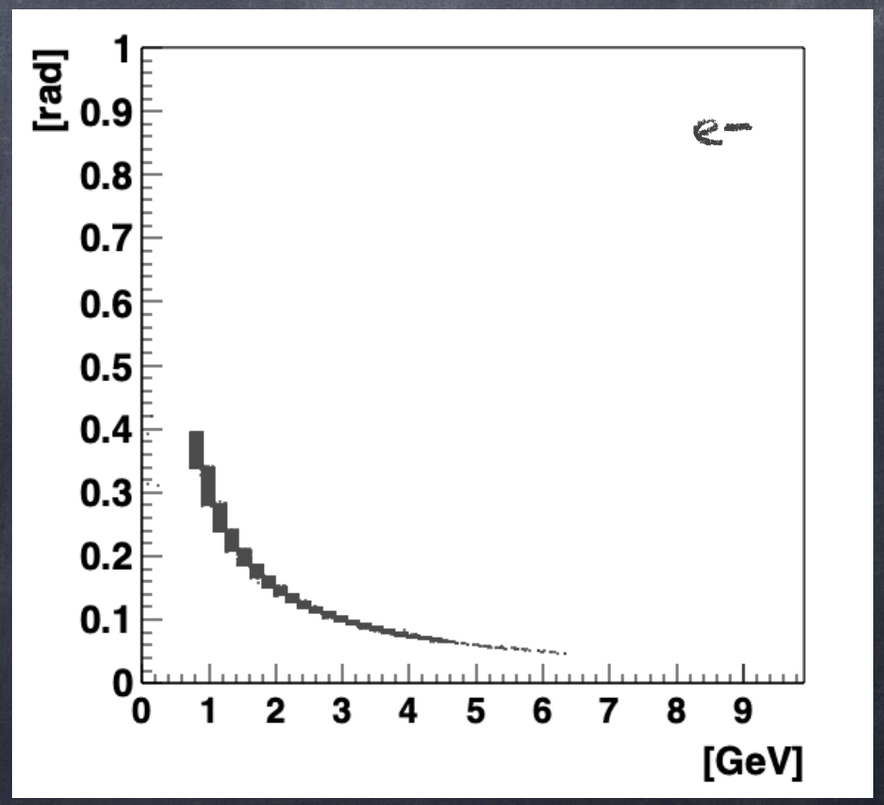


e+/e- from GEANT4

~1000 BX
W thickness 10 um
e+/e- position on a distance of 3.5 m from the magnet:

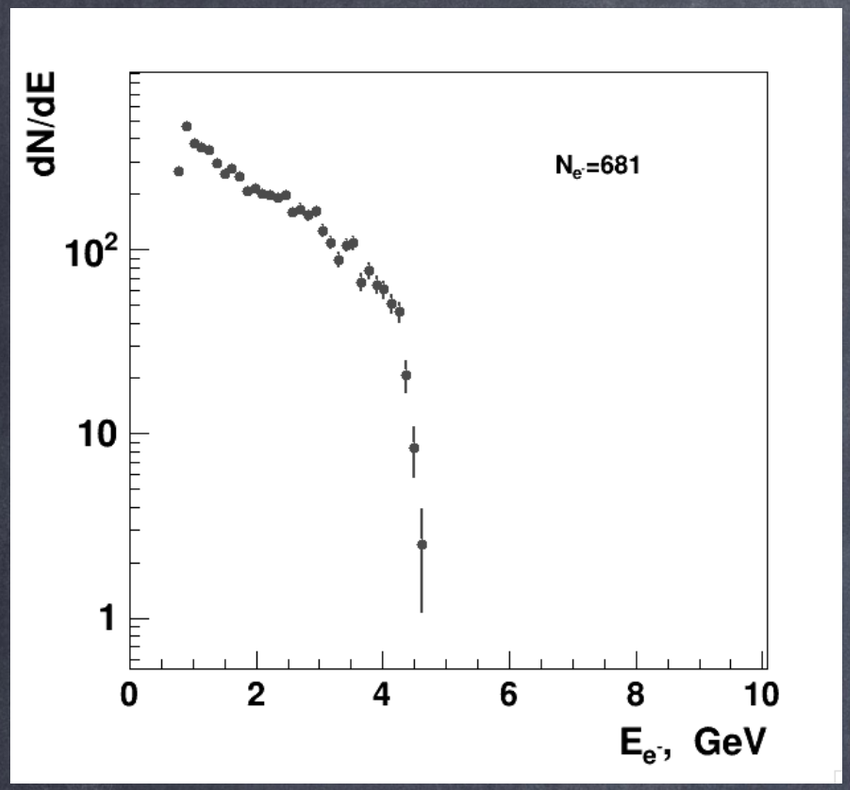


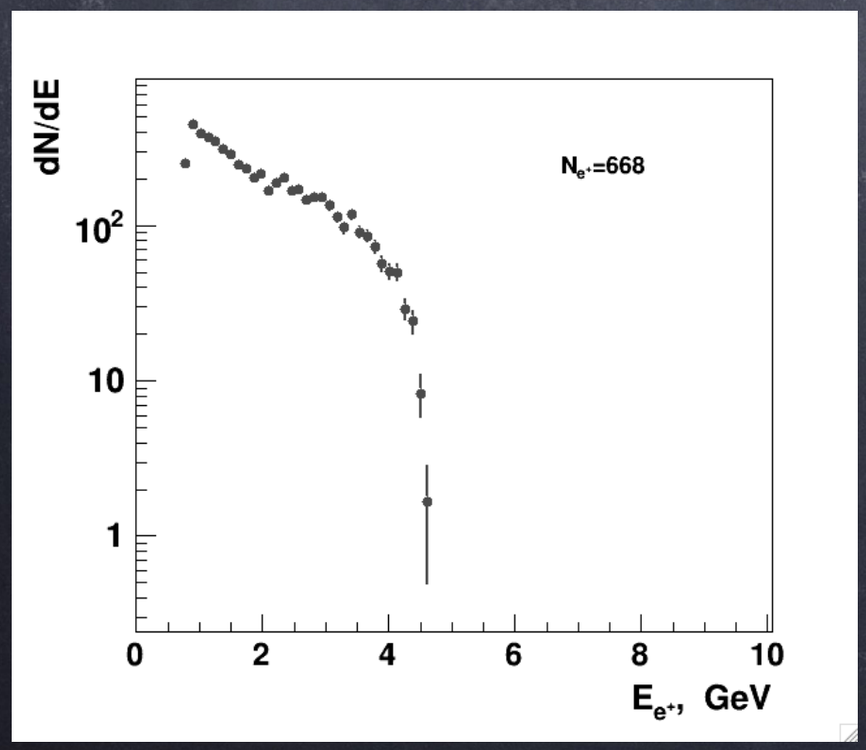


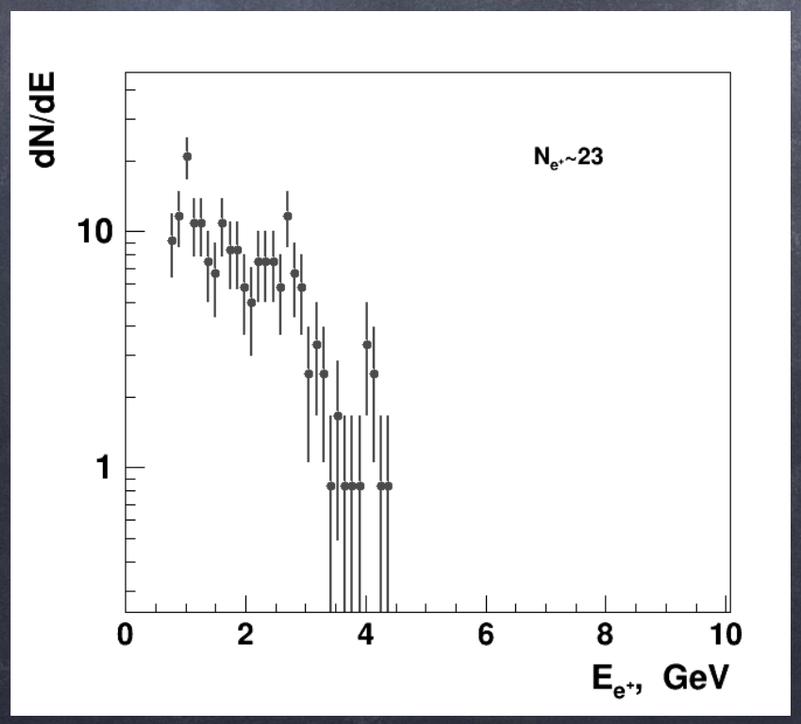


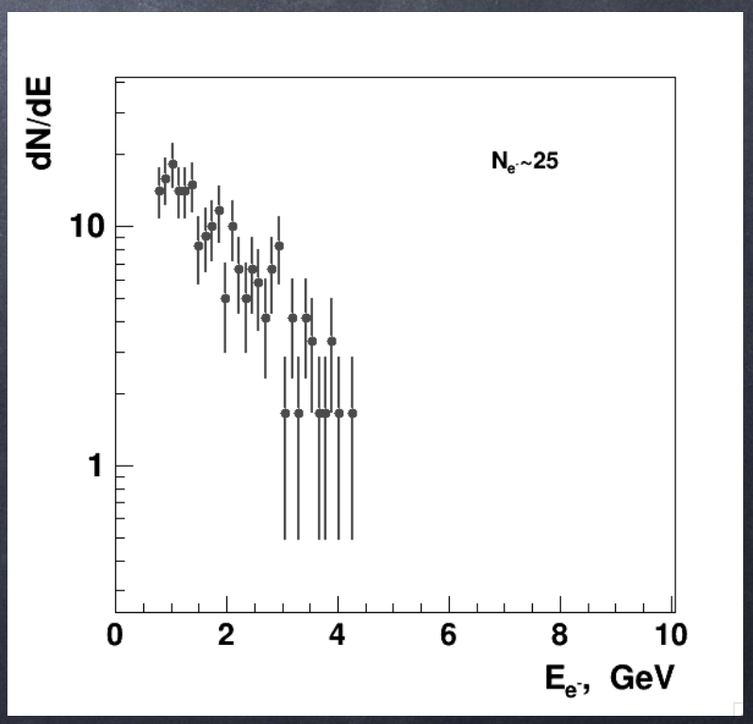
e+/e- spectra for 1 & 5 um wires

d_W, um	e+	e-	Ni, e-
10	2740	2758	148
5	668	681	
1	23	25	7







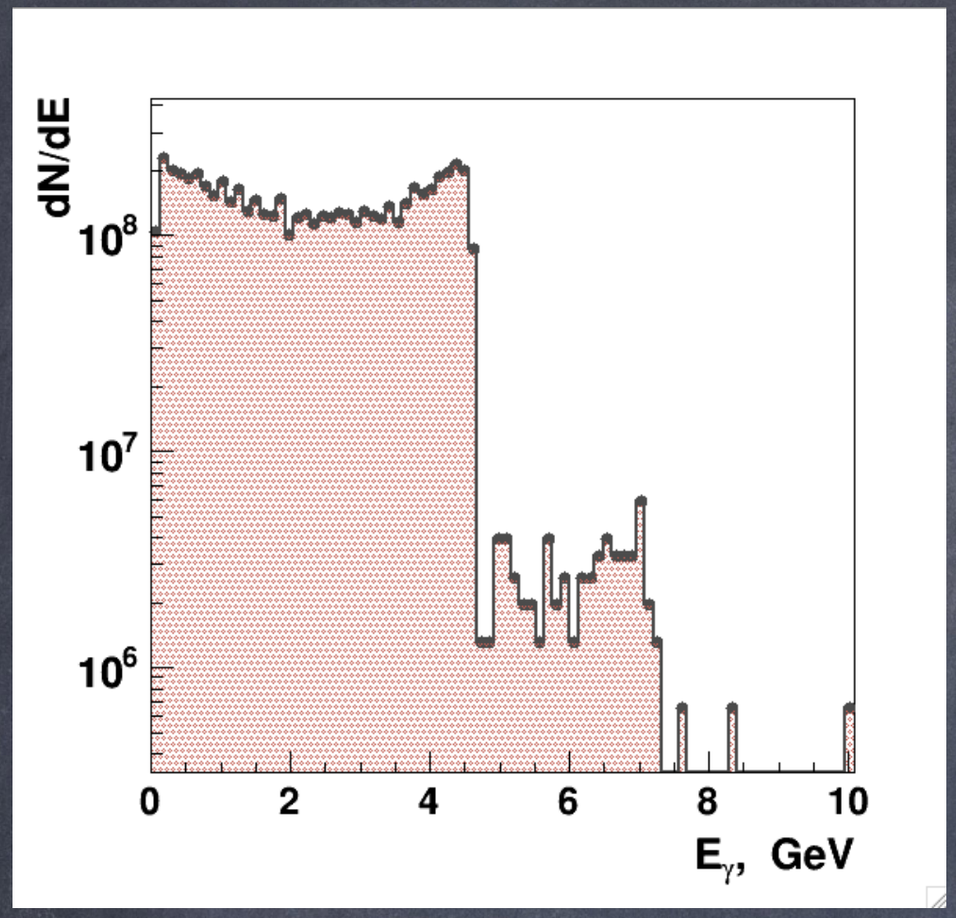


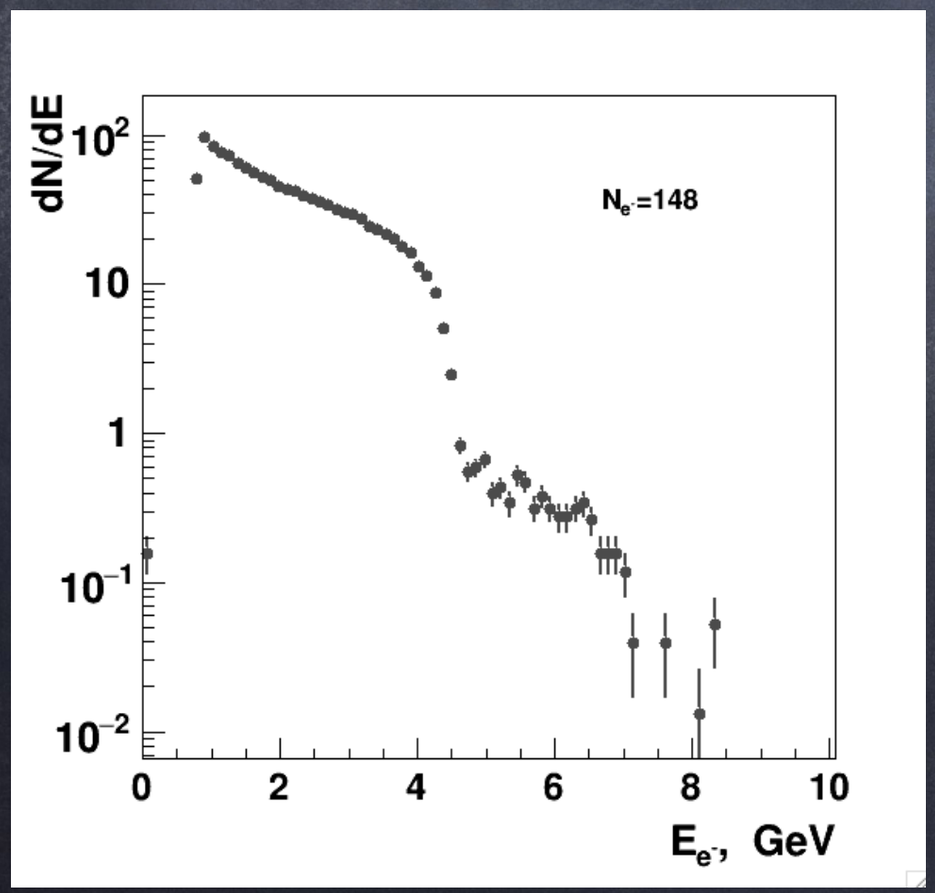
Geant4 simulation for the Ni wire converter spectra

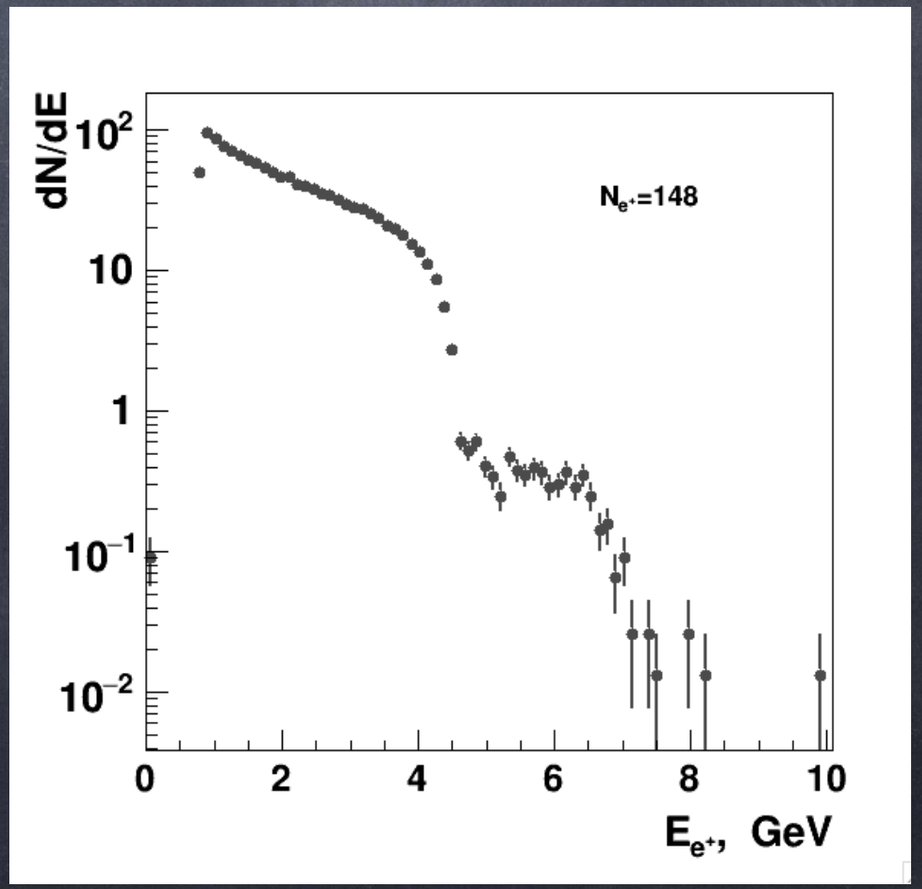
~63000 BX

Ni thickness 10 um

d_W um	Ni, e-
10	148
1	7





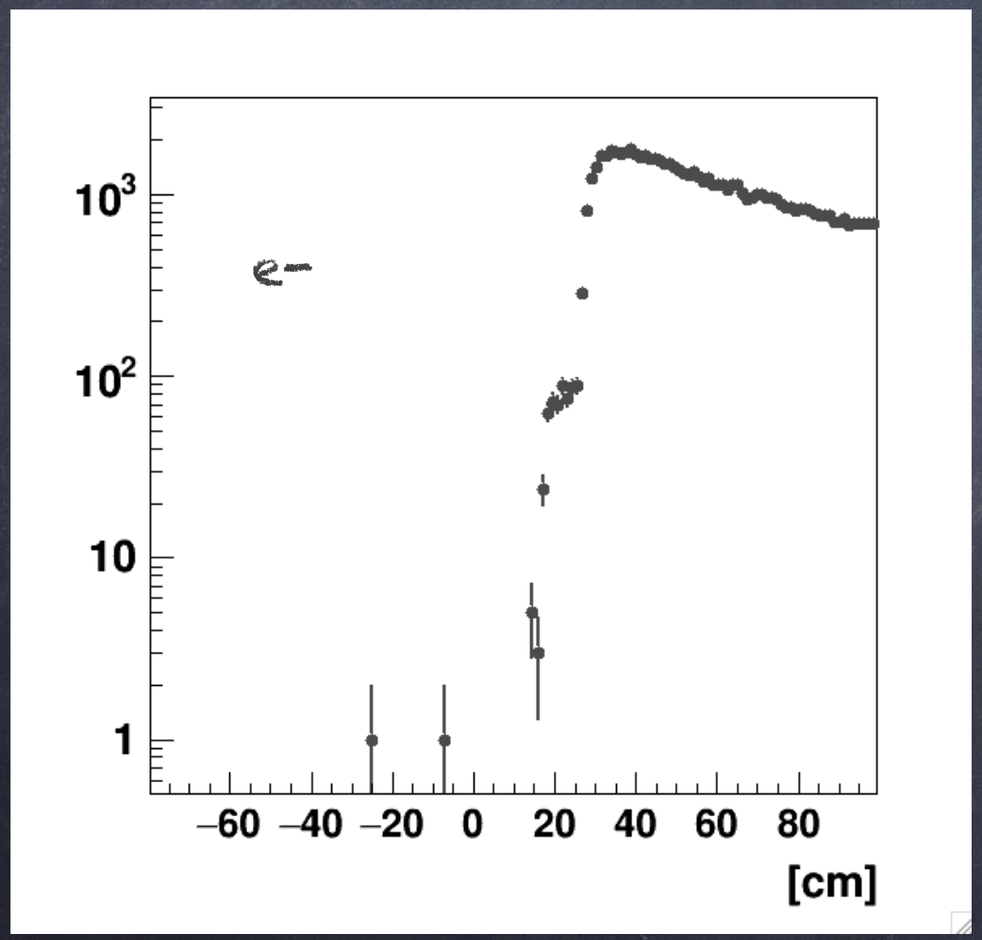


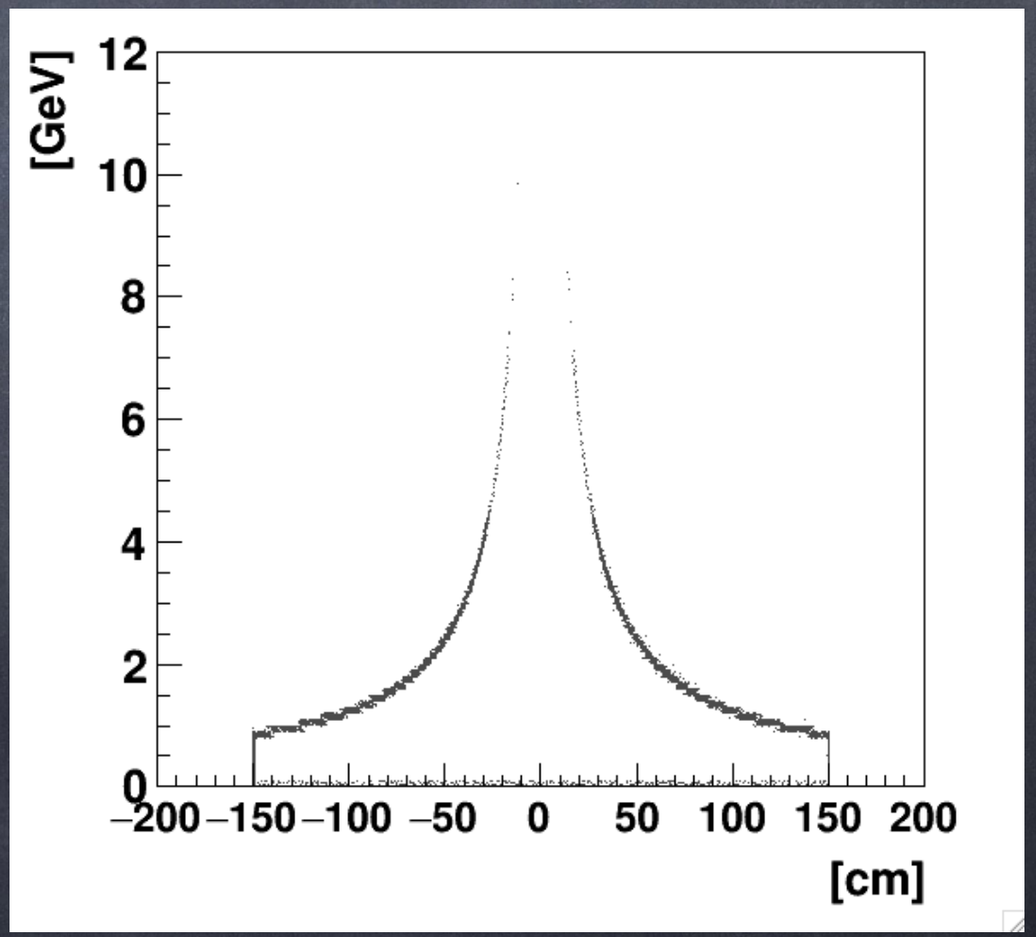
Geant4 simulation for the Ni wire converter

~63000 BX

Ni thickness 10 um

e+/e- position on a distance of 3.5 m from the magnet:





What's done & What's next

- @ MC for HICS + trident with primary electrons: well visible first and 2nd (!) kinematic edges for the lowest ξ=0.26 (corresponds to 0.01 J) for the Ni target of ~10 μm

- Using wire targets of Ni, W w/ the thickness ~1-10 μm number of pairs could be varied 10-10^4. E.g. for Ni 10 μm, 10m from IP Number of pairs ~150 (ξ=0.26)

➡ Move to realistic geometry w/ detector implementation (tracker +calorimeter)

➡ Perform the simulation for 14 GeV

Back up

ξ vs Eγ FROM MC