TCS trigger studies

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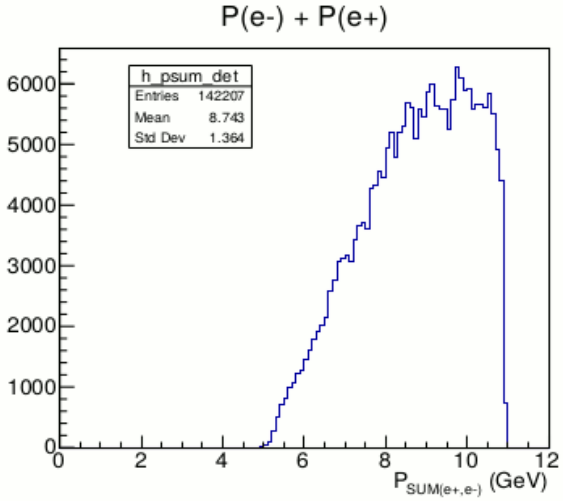
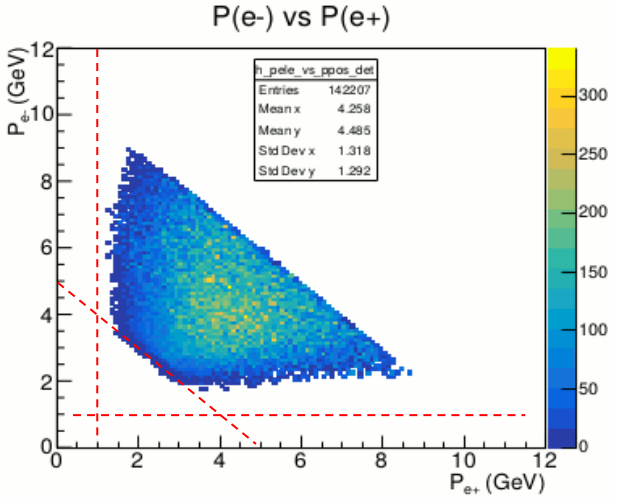
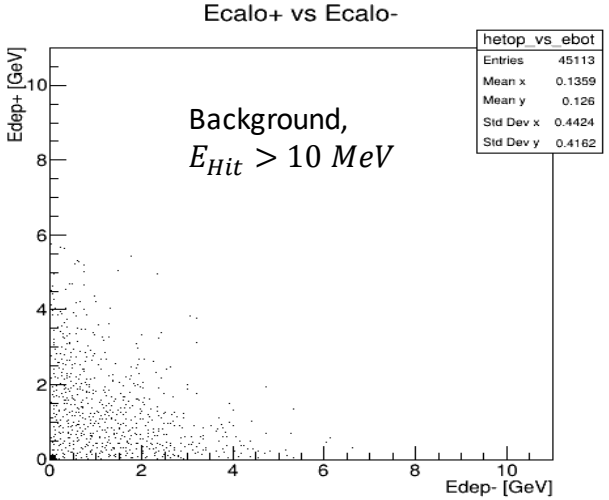
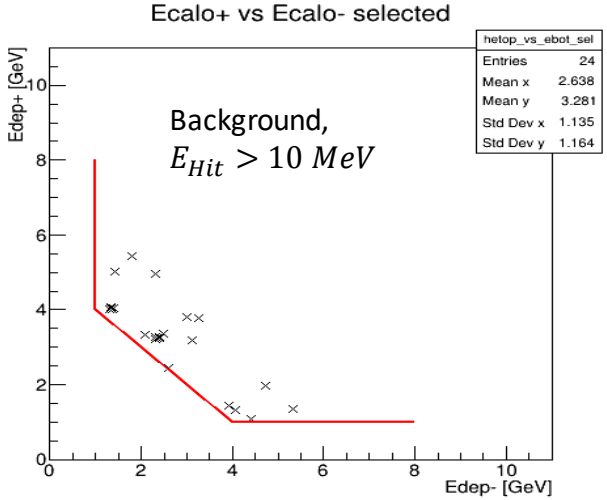
NPS meeting
05/10/2018





BH events from acceptance studies.
Kinematic cuts applied, e^+, e^-, p detected.

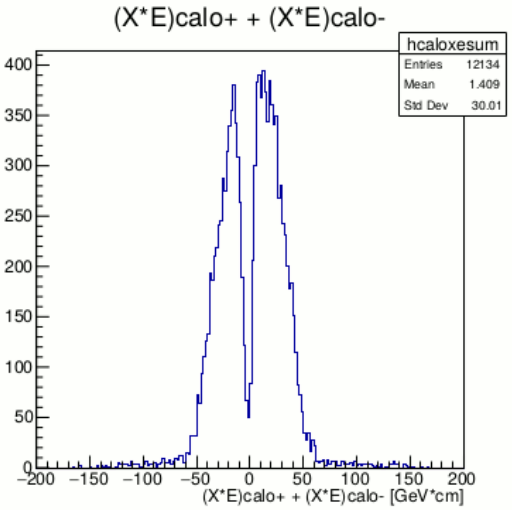


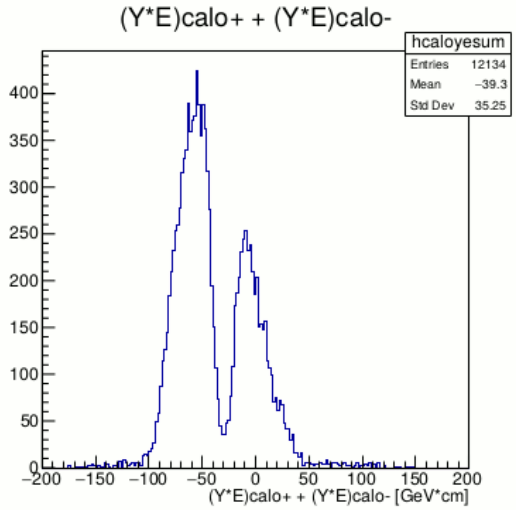


Background (γ-conversion) events from G4 simulation
Cuts:

- $E_{Hit} > 10\ MeV$
- $E_+ > 1\ GeV, E_- > 1\ GeV$
- $E_+ + E_- > 5\ GeV$

$\sim 2 \cdot 10^3$background reduction,
Residual bkgr. $3.6 \cdot 10^5\ Hz$.





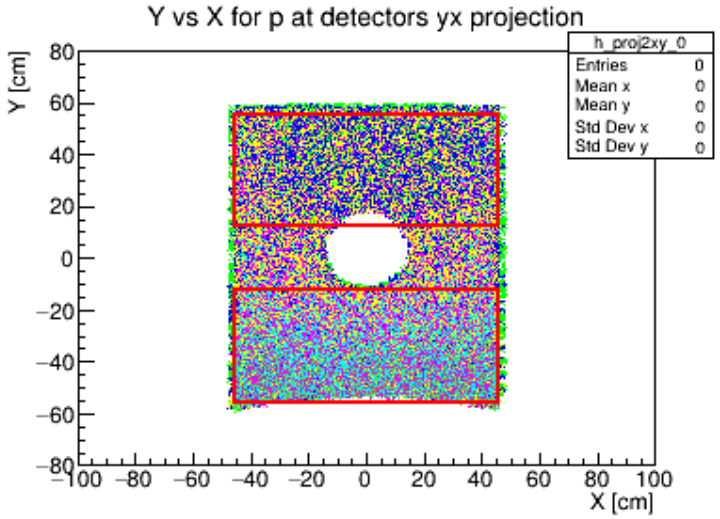
DEEPGen + TCS setup G4 sim.

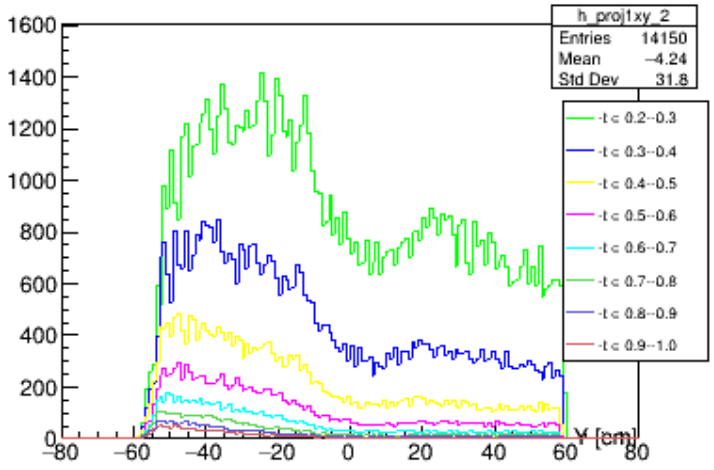
$$X \cdot E_+ + X \cdot E_- \sim P_X(\gamma^*)$$

$$Y \cdot E_+ + Y \cdot E_- \sim P_Y(\gamma^*)$$

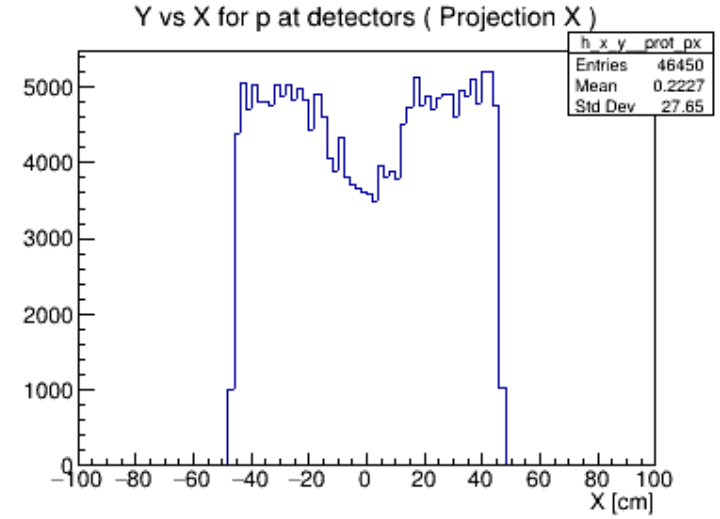
Next steps:

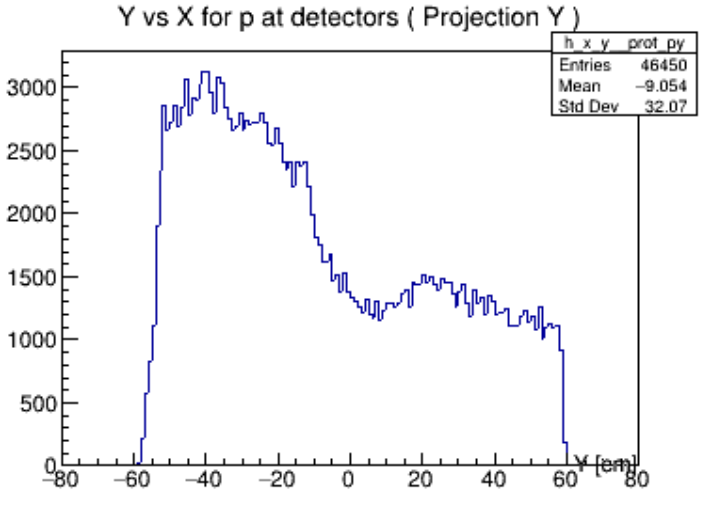
- Compare $X \cdot E_+ + X \cdot E_-$ and $Y \cdot E_+ + Y \cdot E_-$ with background events
- Look for correlations with proton in hodoscopes
- Modify hodoscopes for better proton PID

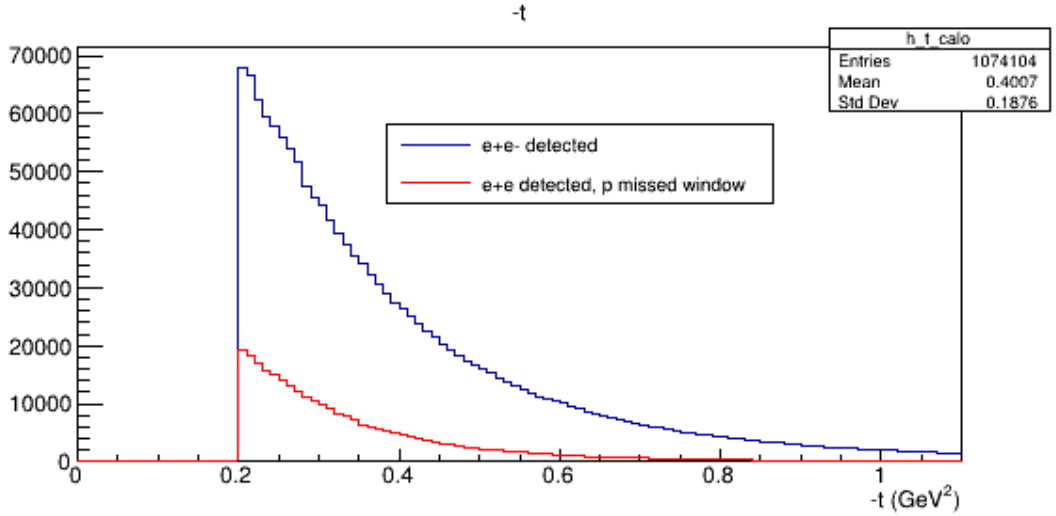


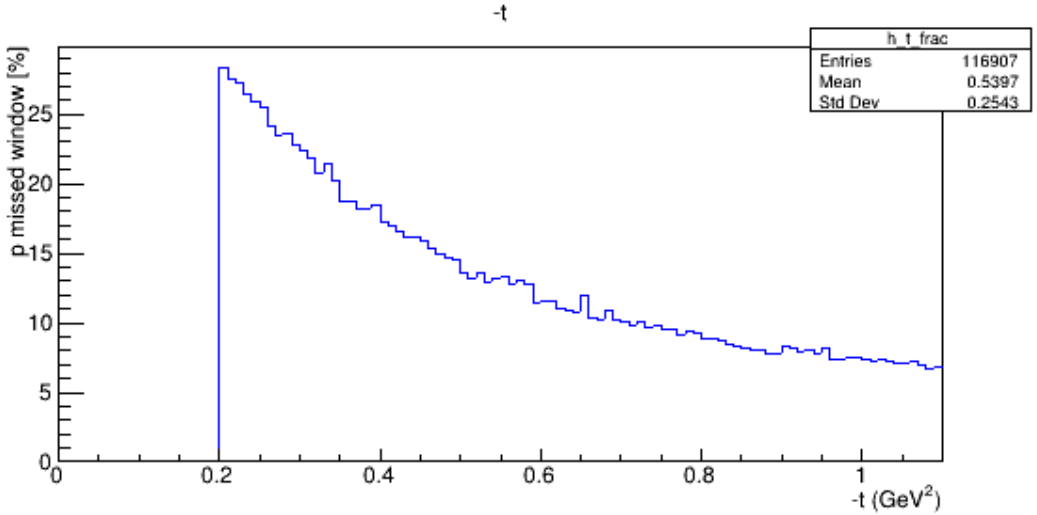


BH events from acceptance studies. Kinematic cuts applied, e^+, e^- detected, proton missed chamber exit window.



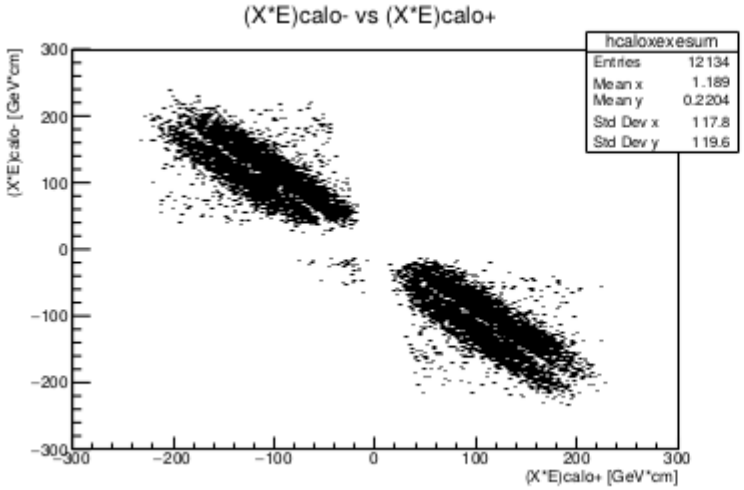


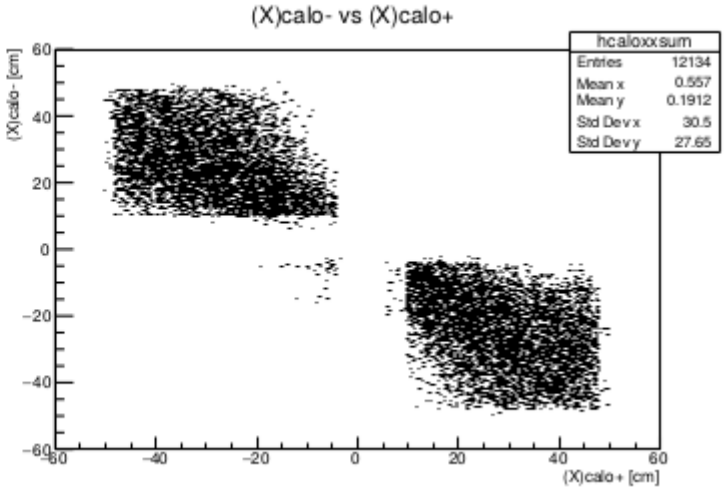


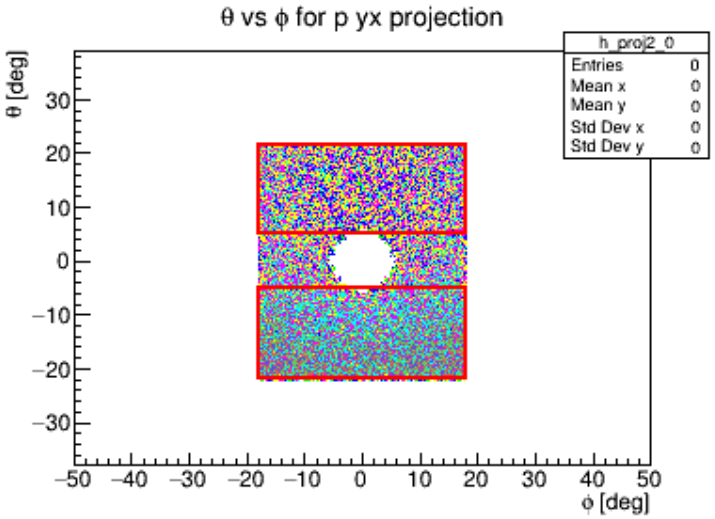


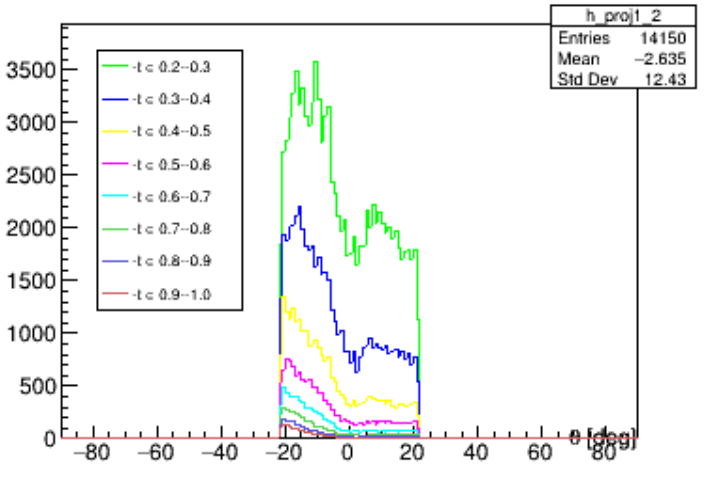
BH events from acceptance studies.
Kinematic cuts applied.

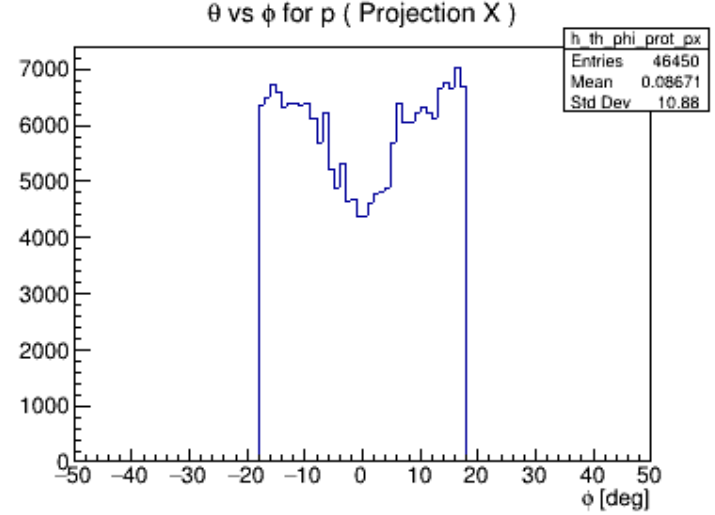
Backup slides

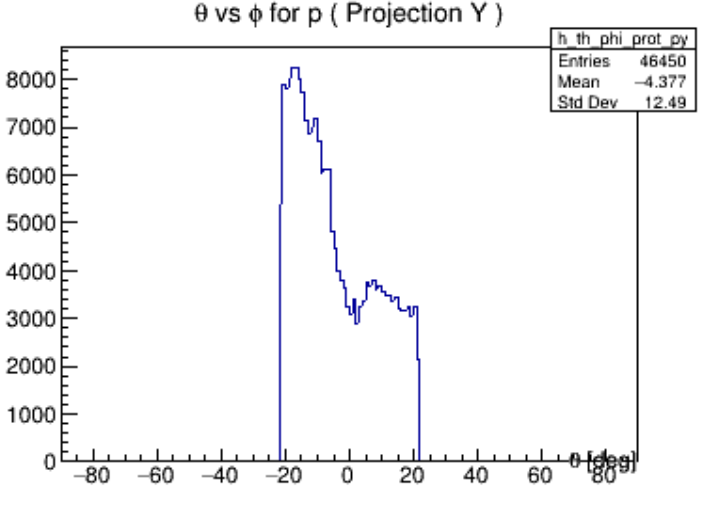

(X*E)calo- vs (X*E)calo+
hcaloxexesum
Entries 12134
Mean x 1.189
Mean y 0.2204
Std Dev x 117.8
Std Dev y 119.6
(X*E)calo- [GeV*cm]
(X*E)calo+ [GeV*cm]


(X)calo- vs (X)calo+
hcaloxxsum
Entries 12134
Mean x 0.557
Mean y 0.1912
Std Dev x 30.5
Std Dev y 27.65
(X)calo- [cm]
(X)calo+ [cm]


θ vs ϕ for p yx projection
h_proj2_0
Entries 0
Mean x 0
Mean y 0
Std Dev x 0
Std Dev y 0
θ [deg]
ϕ [deg]


h_proj1_2
Entries 14150
Mean −2.635
Std Dev 12.43
-t ∈ 0.2--0.3
-t ∈ 0.3--0.4
-t ∈ 0.4--0.5
-t ∈ 0.5--0.6
-t ∈ 0.6--0.7
-t ∈ 0.7--0.8
-t ∈ 0.8--0.9
-t ∈ 0.9--1.0
θ [deg]


θ vs ϕ for p (Projection X)
h_th_phi_prot_px
Entries 46450
Mean 0.08671
Std Dev 10.88
ϕ [deg]


θ vs ϕ for p (Projection Y)
h_th_phi_prot_py
Entries 46450
Mean −4.377
Std Dev 12.49
θ [deg]