DY@AMBER: Drell-Yan beam: ideas

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DY@AMBER: Remembering...

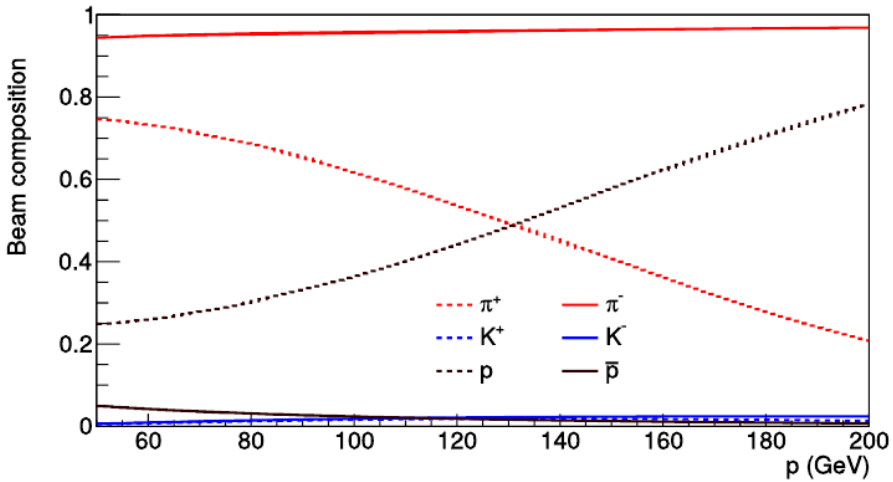
Momentum (GeV/c)	Positive beams			Negative beams		
	π^+	K^+	p	π^-	K^-	$\overline{p}$
100	0.618	0.015	0.367	0.958	0.018	0.024
160	0.360	0.017	0.623	0.966	0.023	0.011
190	0.240	0.014	0.746	0.968	0.024	0.008
200	0.205	0.012	0.783	0.969	0.024	0.007

NIMA 779 (2015) 69–115

Major Problem:

- Positive beam contamination dominated by protons
- Cannot increase intensity due to radiation safety

AMBER SPSC-Proposal



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DY@AMBER: Possible solutions...

Momentum (GeV/c)	Positive beams			Negative beams		
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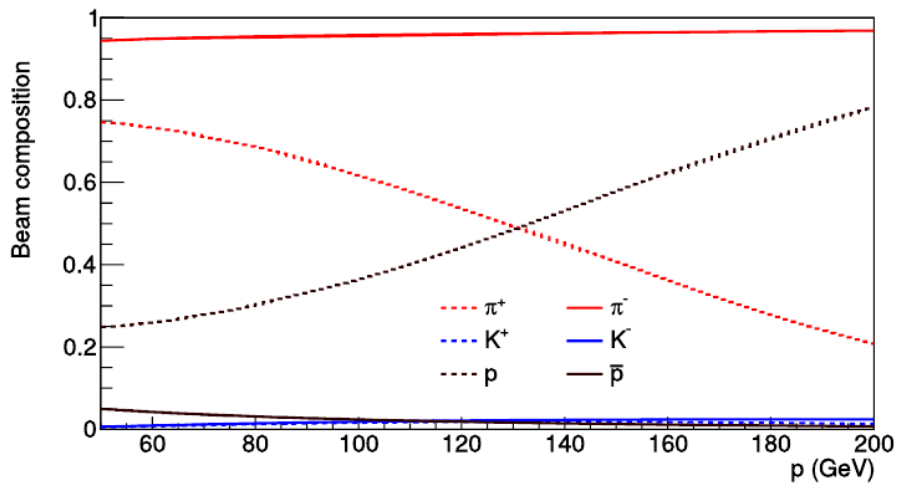
Decrease beam energy to 160 GeV/C:

- More pions available
- Still some doubts on the possibility

AMBER SPSC-Proposal



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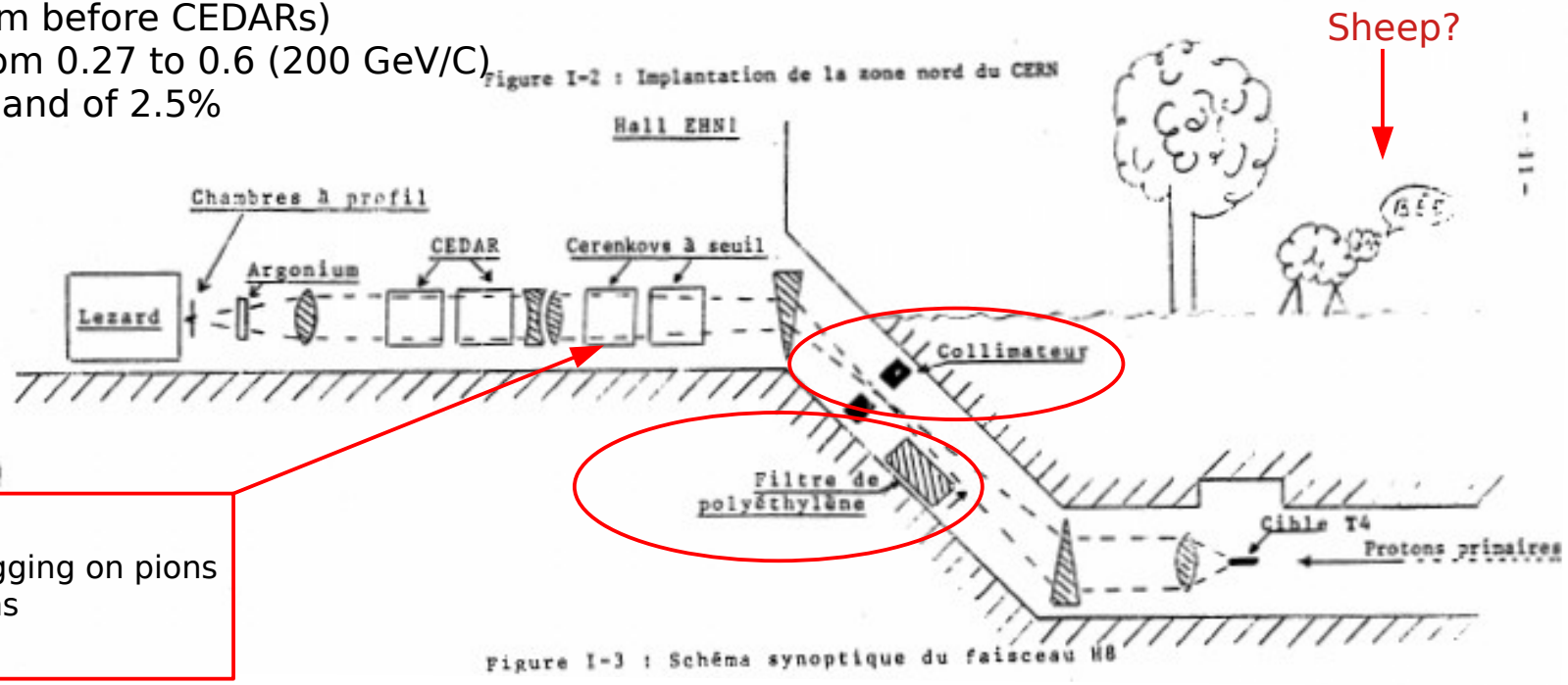
DY@AMBER: Possible solutions...

Use of a differential absorver:

- NA3 Thesys: Sylvain Weiz (1982): http://cds.cern.ch/record/139972
- 2m Polyethylene (200m before CEDARs)
- pi/p ration increase from 0.27 to 0.6 (200 GeV/C)
- Collimator with pass band of 2.5%
- No more info

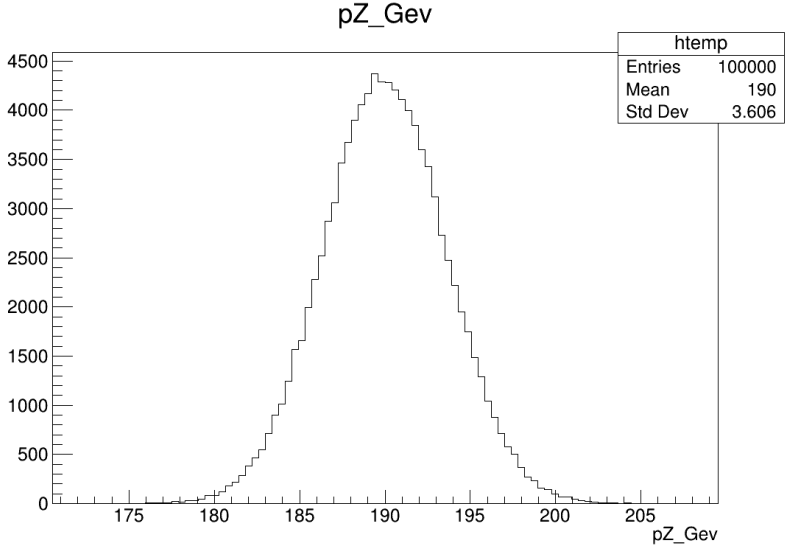


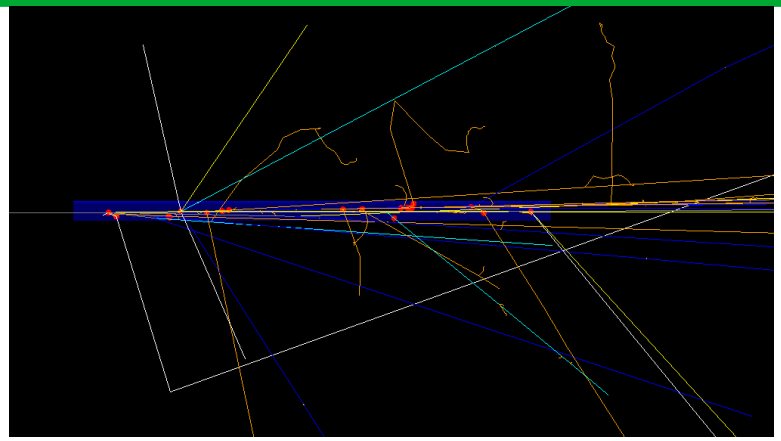
2 Cherenkov Threshold tagging on pions
2 CEDARs tagging on kaons

DY@AMBER: GEANT4 studies on a polyethylene absorver

Conditions:

- 100K events per run
- Pion, kaon and proton beams
- 2m, 1m and 0.5m of polyethylene
- Beam momentum: 190GeV/C, sigma=3.6*GeV





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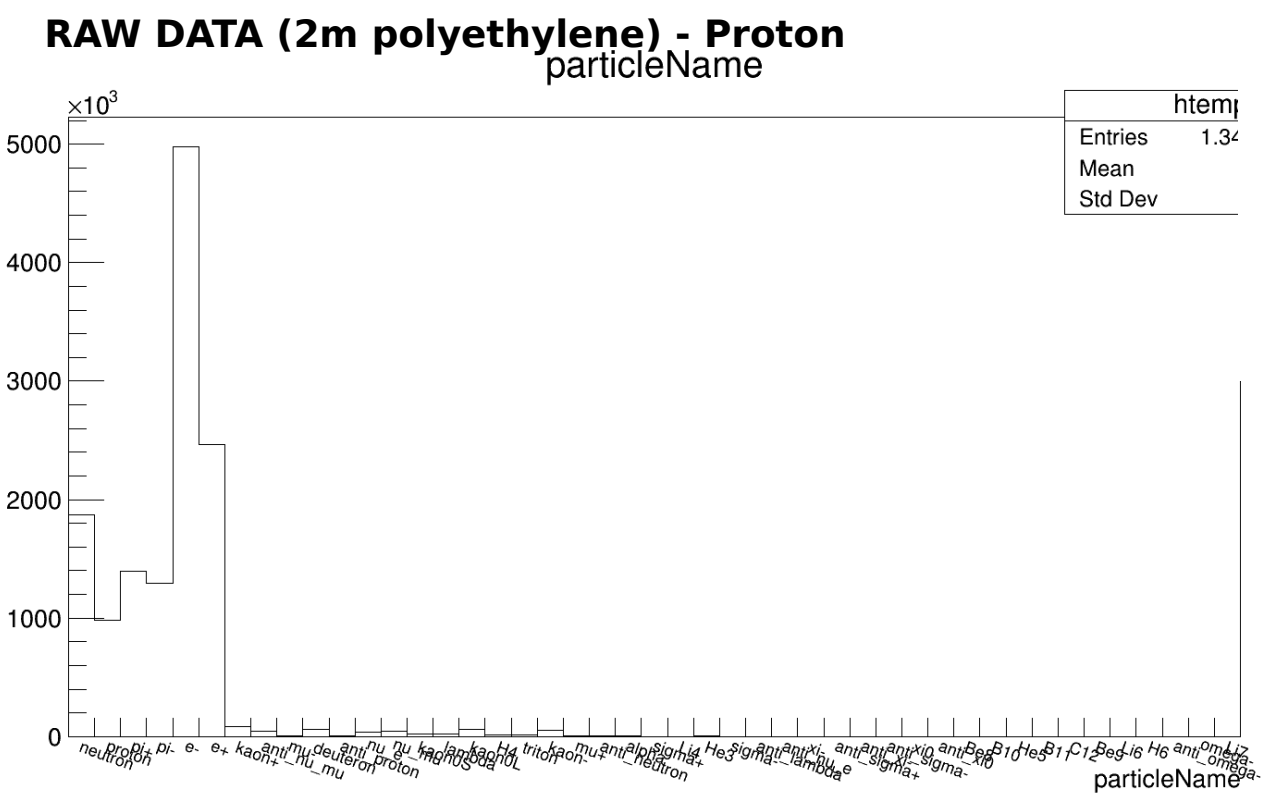
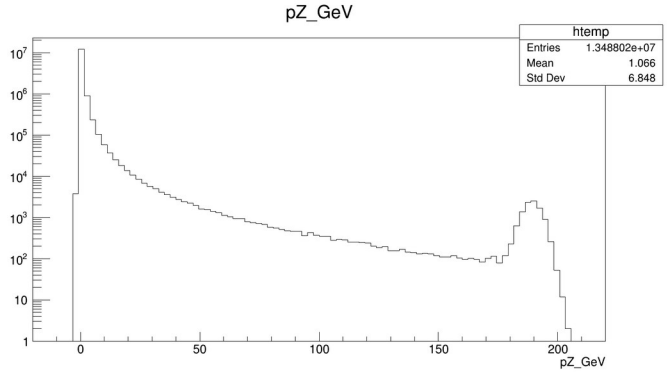
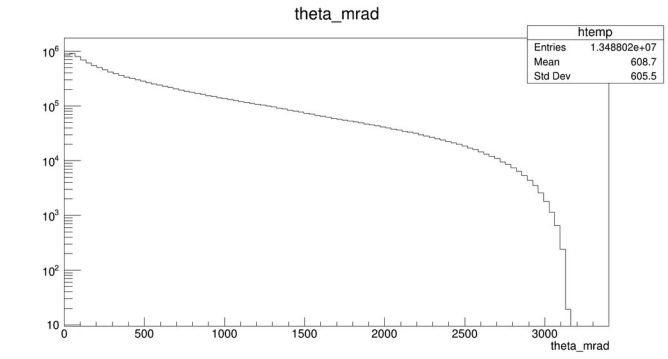
DY@AMBER: GEANT4 studies on a polyethylene absorver







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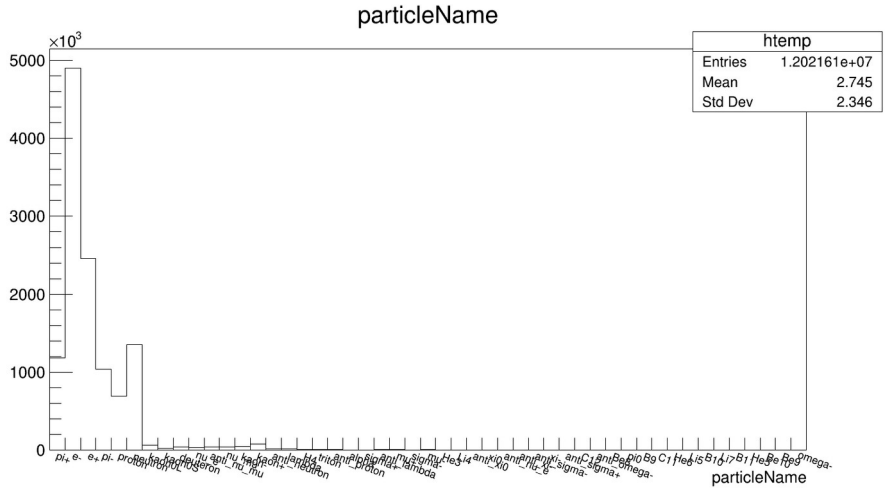
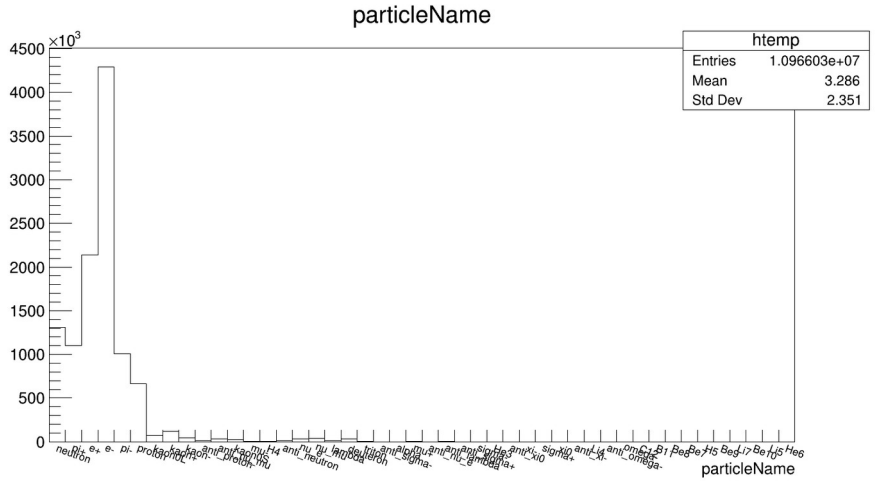
DY@AMBER: GEANT4 studies on a polyethylene absorver

RAW DATA (2m polyethylene) – pion+ and kaon+

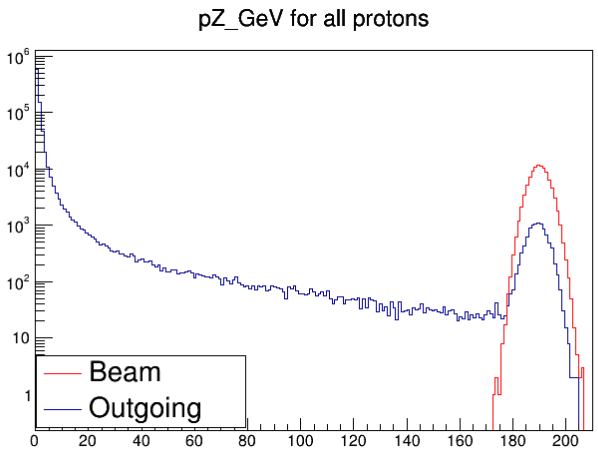




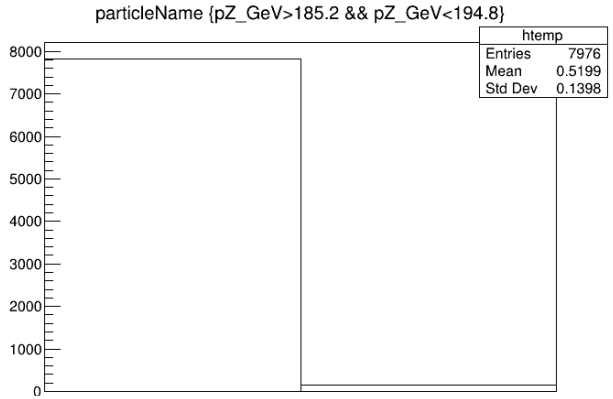
Others histograms (pZ and theta) seams similar to proton results

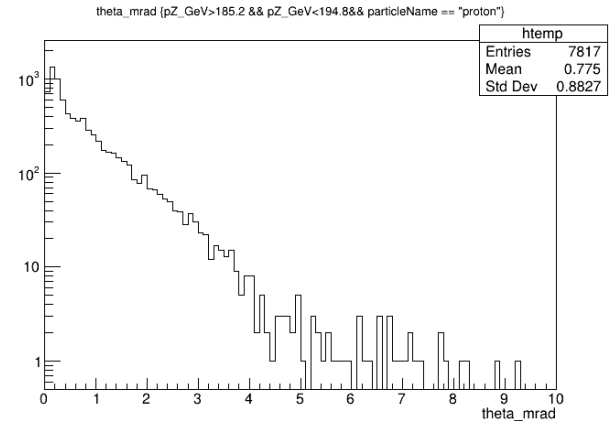
DY@AMBER: GEANT4 studies on a polyethylene absorver

Starting Cuts (2m polyethylene) - Proton



Cut:
185.25<pZ<194.75





2.5% as described in thesis

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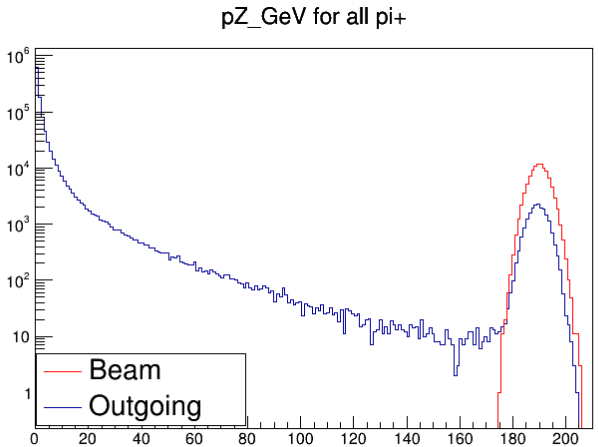
Starting Cuts (2m polyethylene) - Pi+



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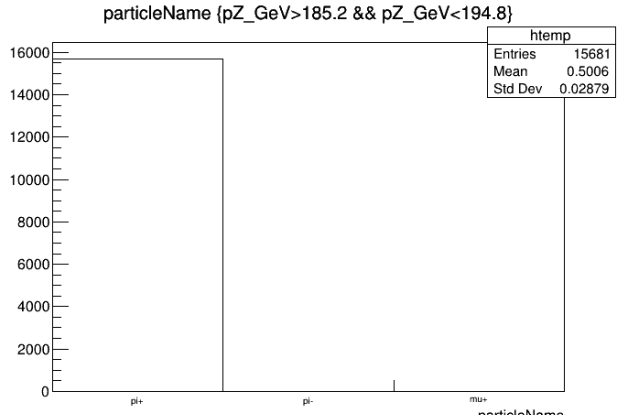

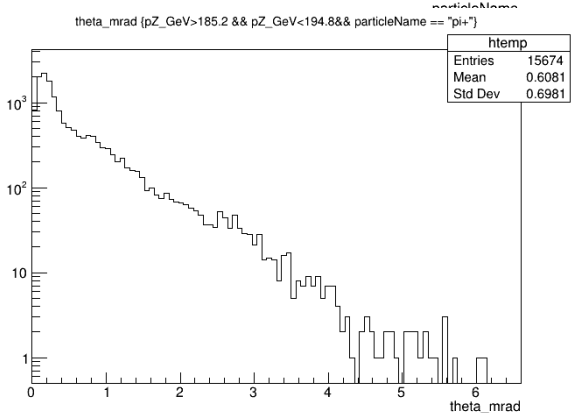

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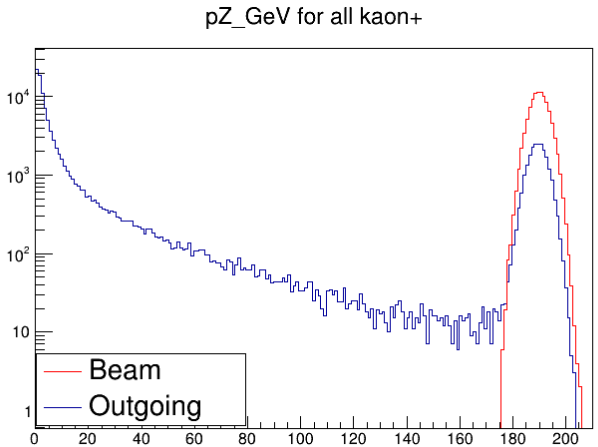
Starting Cuts (2m polyethylene) - Kaon+



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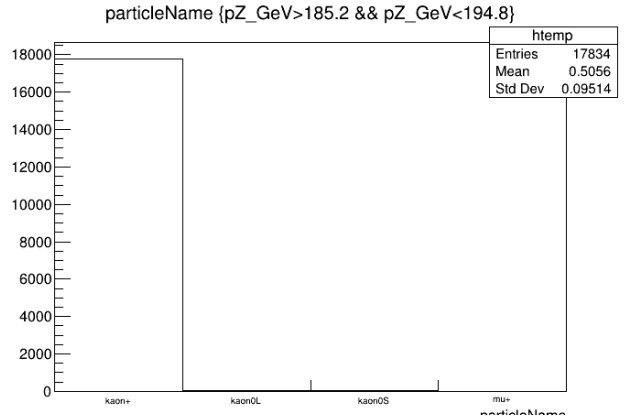

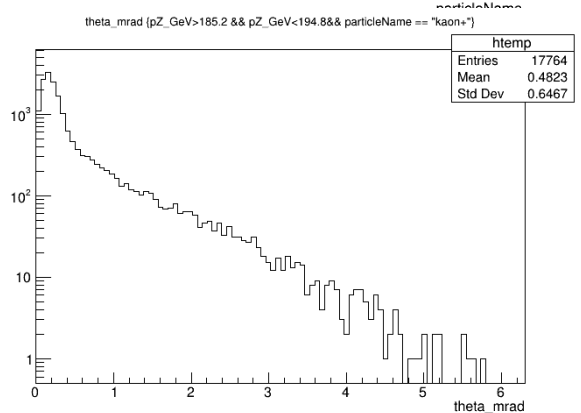

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DY@AMBER: GEANT4 studies on a polyethylene absorver

Cut on pZ and theta<1mrad

	Transmission Polyethylene Length		
BeamParticle	2m	1m	0.5
Proton	7.5%	26.6%	51.2%
Pi+	15.5%	39.4%	62.8%
K+	18.8%	44%	65.3%

pi+/p ratio=0.66%

Close to NA3 (0.6)

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Gain if double the intensity

Problem:

- Radioprotection at polyethylene location?
- Beam divergence?

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BACKUP