

SOLENOID DECAY CHANNEL STUDY

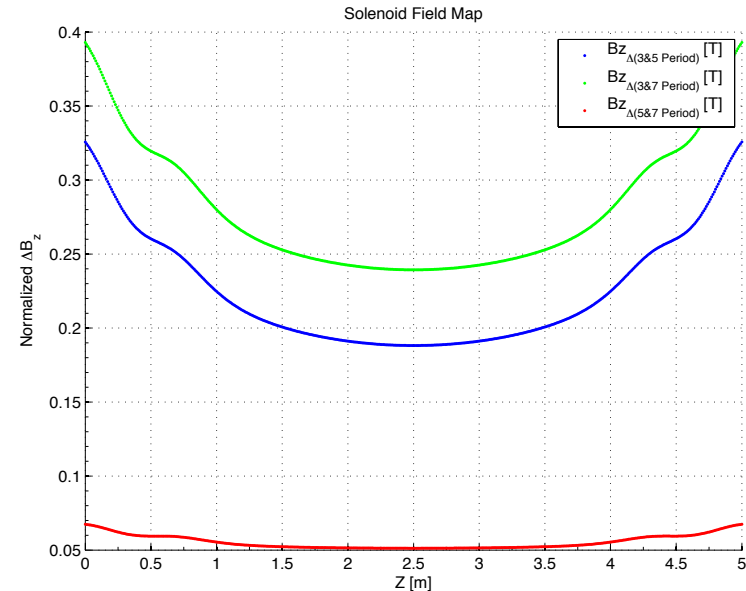
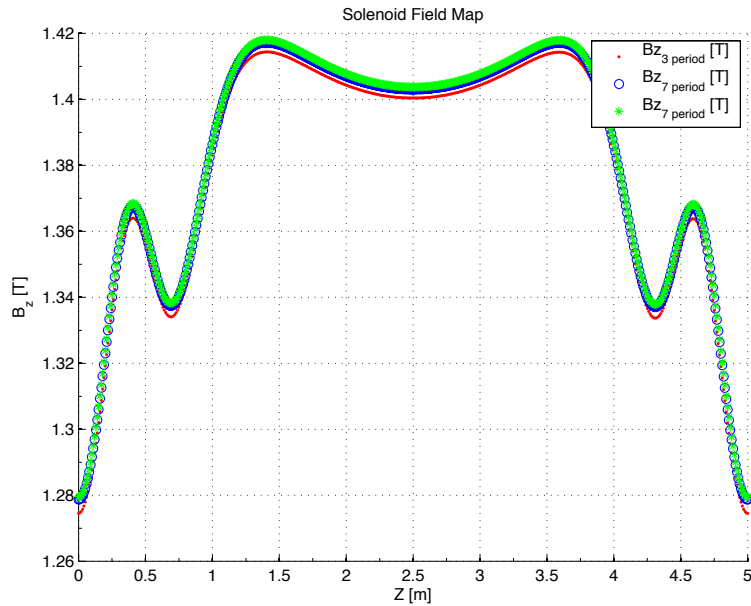
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April 10, 2012

Decay Channel

- Baseline design 1.5 T solenoid channel of 50 m
- Using a realistic periodic solenoid may result in stopbands
→ Particle loss



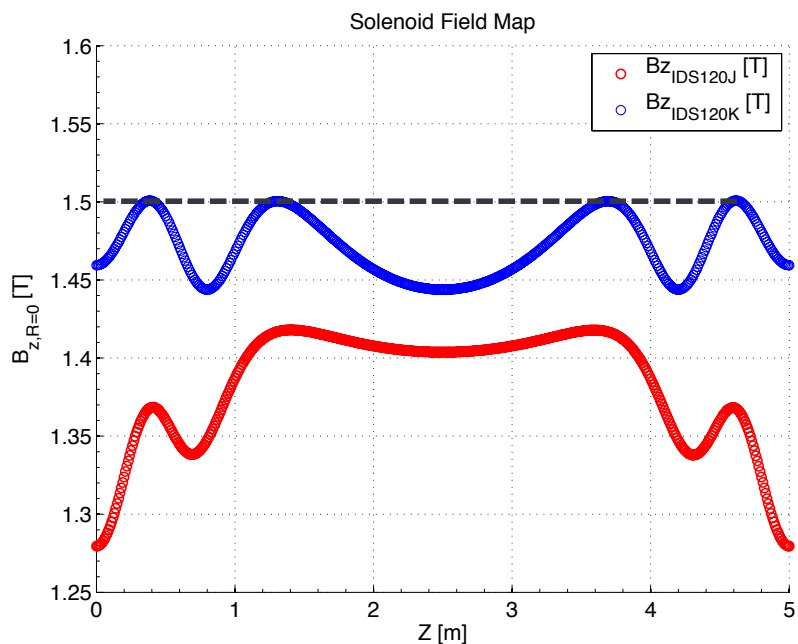
IDS120J Solenoid Field Map (icool boundary conditions)



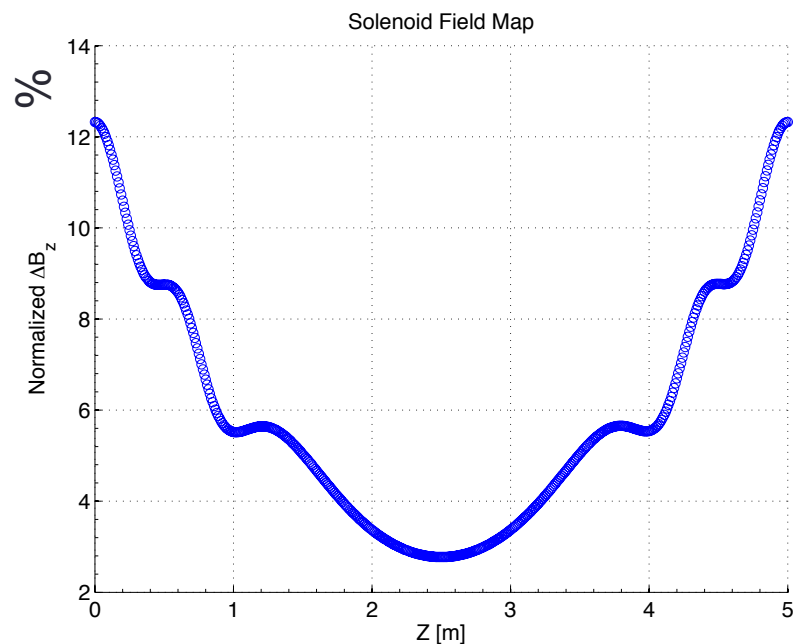
Length [m]	Inner R [m]	Outer R	Current [A/mm ²]
0.05	0.5	0.868	45.815
3.483	0.5	0.523	47.67
0.05	0.5	0.868	45.815

Solenoid Field Map (IDS120K(J))

On Axis Field



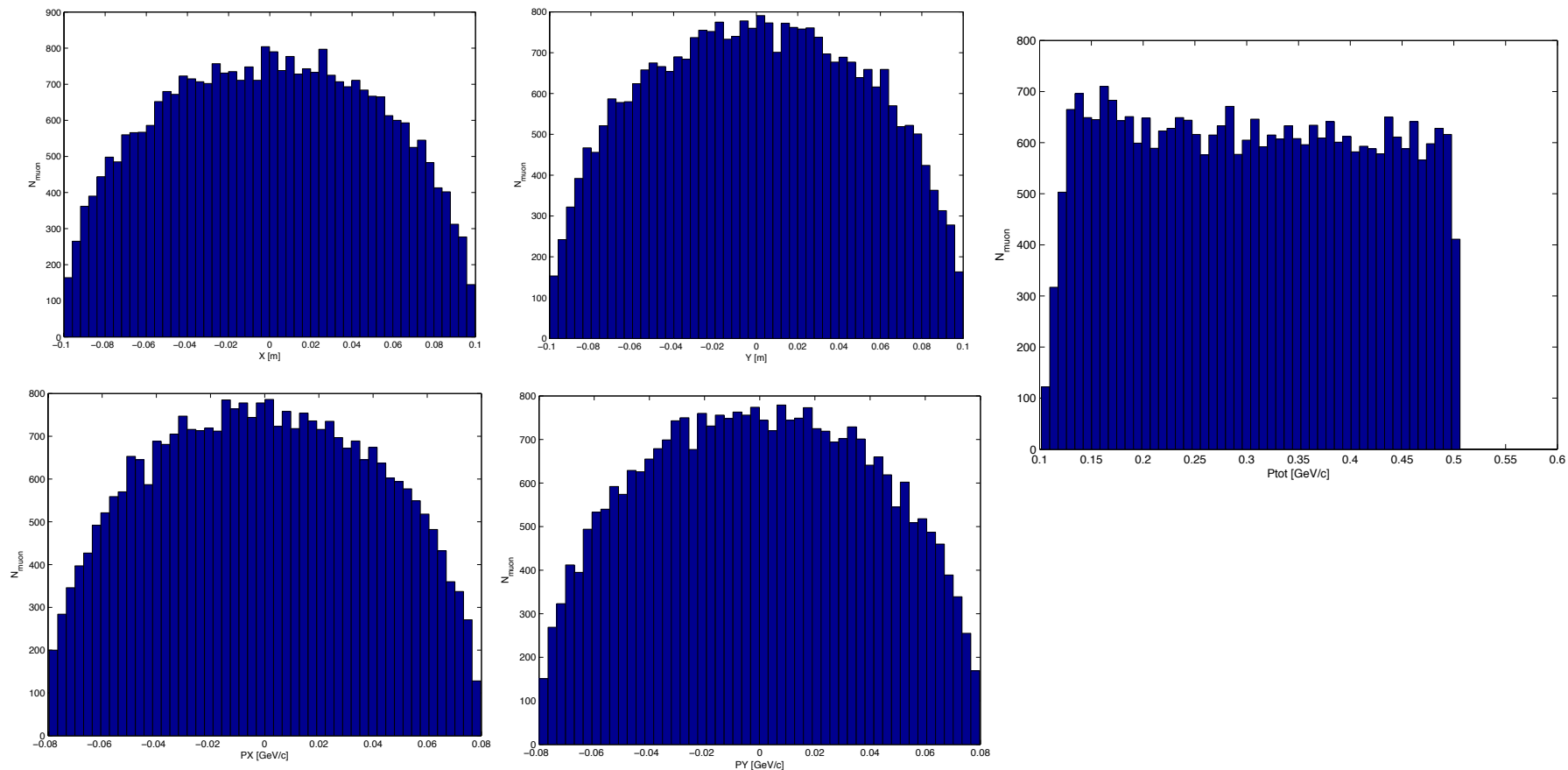
Normalized $\Delta(120J,120K)$



Initial Particle Distribution

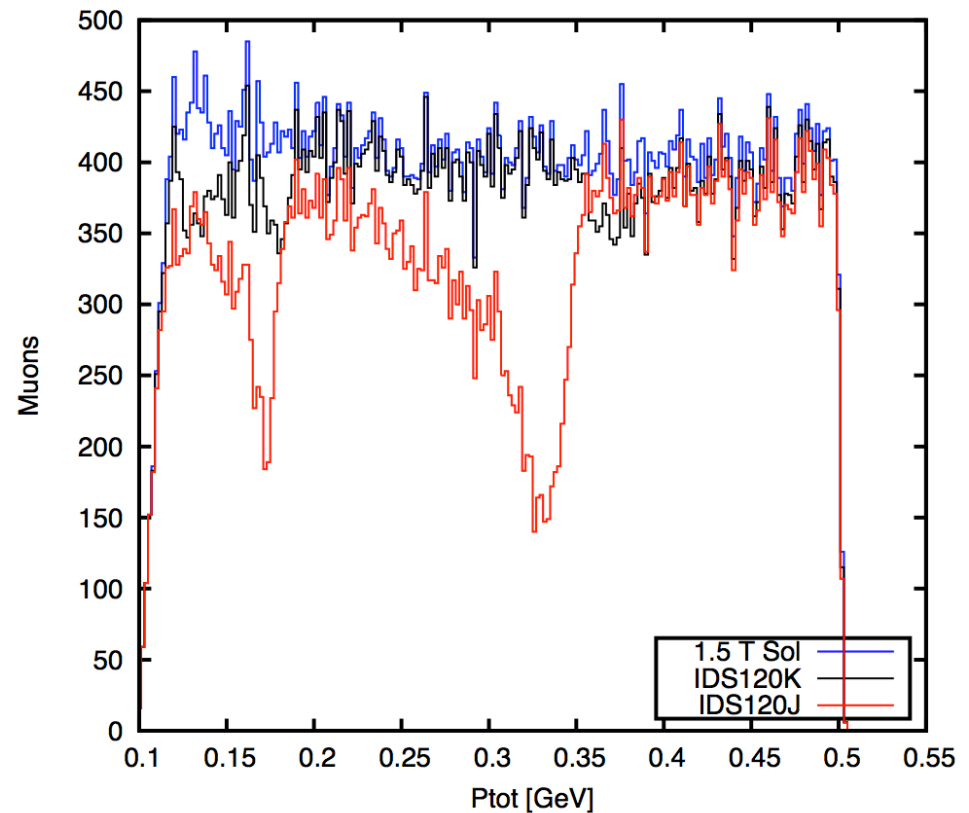
PARTICLE GENERATIONS by ICOOL

$R_{low} = 0.0$ $R_{high} = 0.1$ [m] $\phi_{low} = 0$ [degree] $\phi_{high} = 360$ $z_{low} = 0$ $z_{high} = 0$
 $P_{r_{low}} = 0$ [GeV/c] $P_{r_{high}} = 0.07$ $P_{\phi_{low}} = -0.001$ $P_{\phi_{high}} = 0.001$ $P_{z_{low}} = 0.1$ [GeV/c]
 $P_{z_{high}} = 0.5$

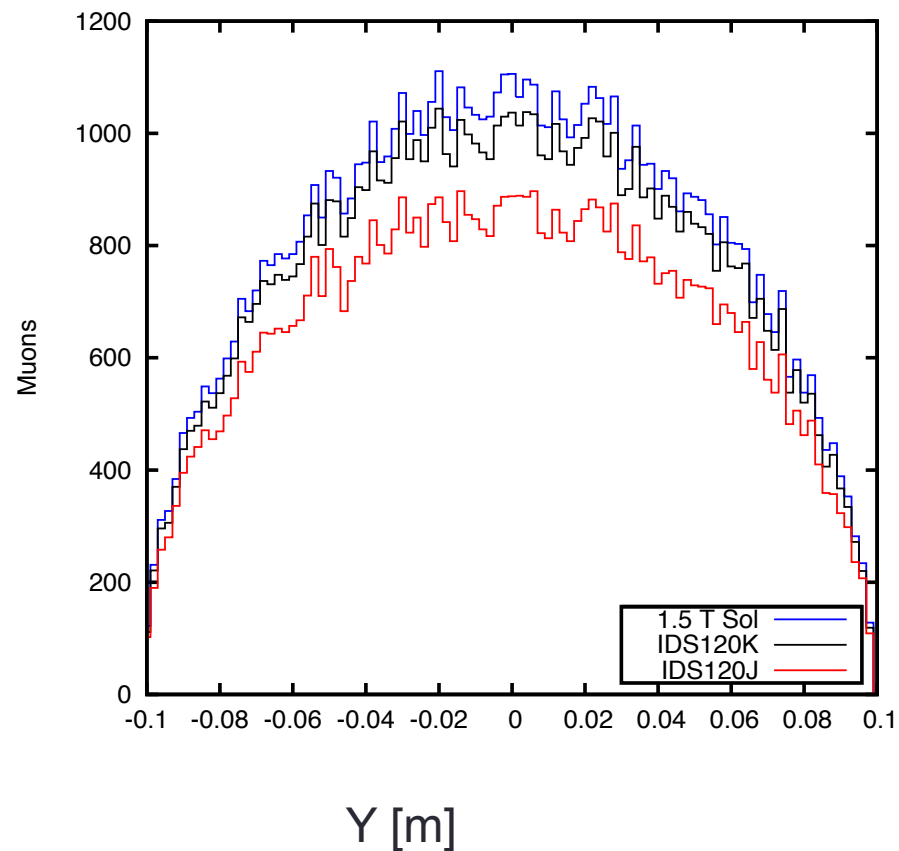
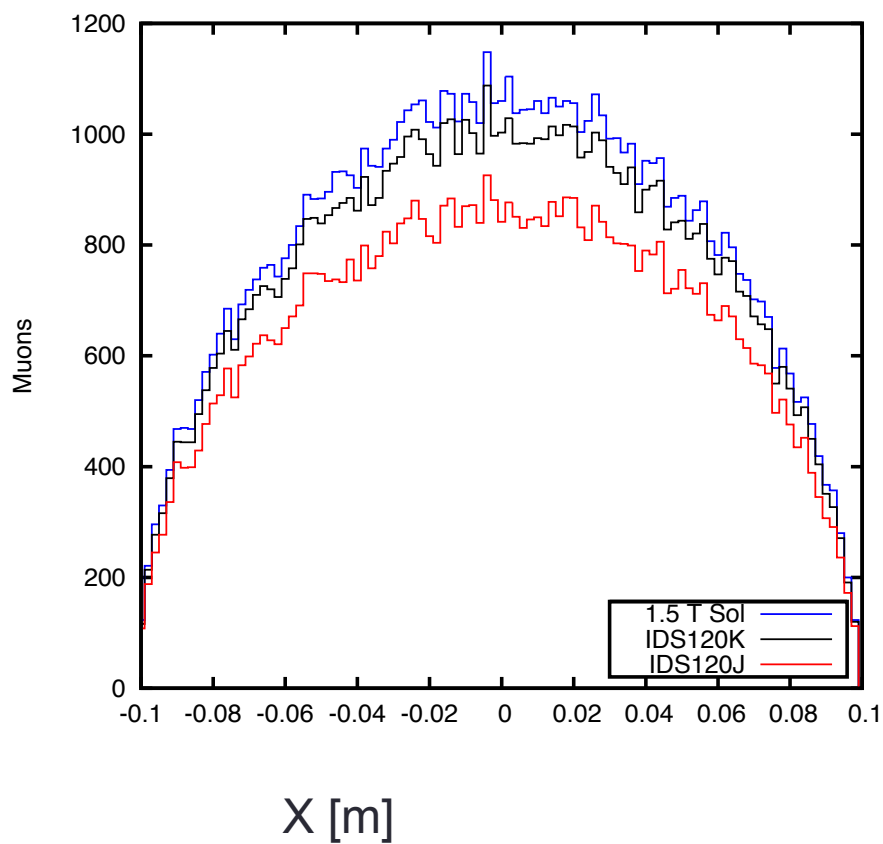


Particle Tracking

- Initial Number of Particles 99000
- Particles passed 1.5 T const. sol field 80528 (18%)
- Particles passed IDS120J channel 66451 (17%)
- Particles passed IDS120K channel 76473 (5%)

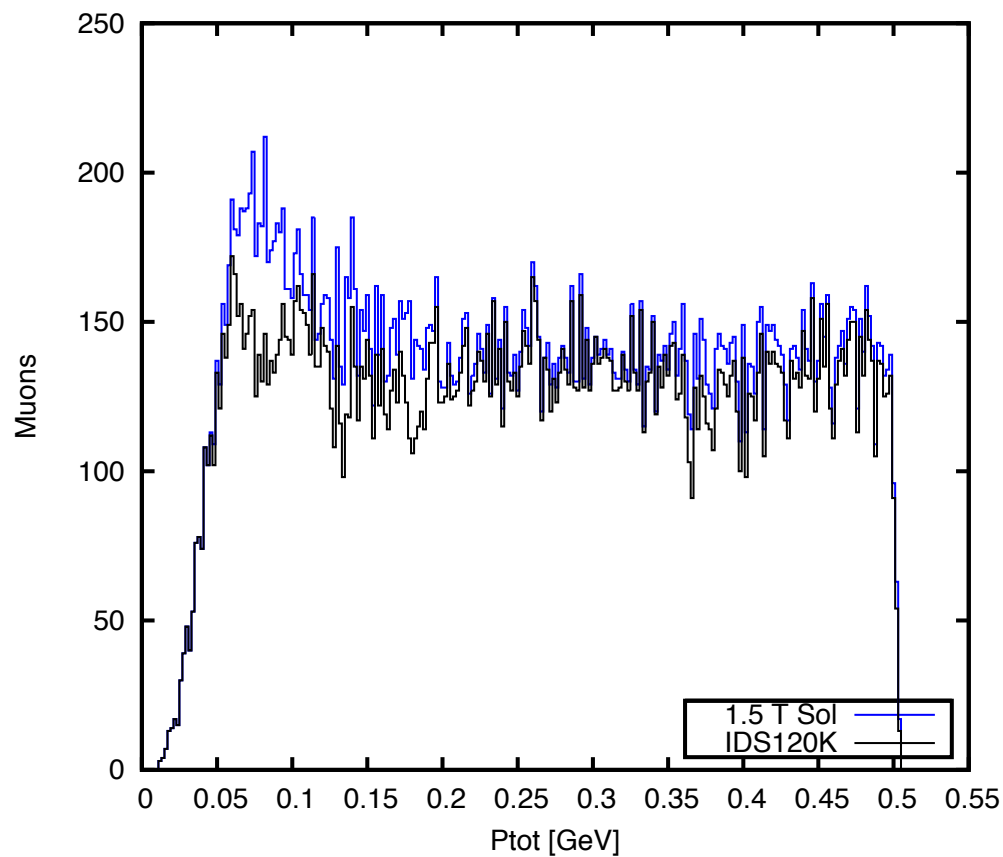


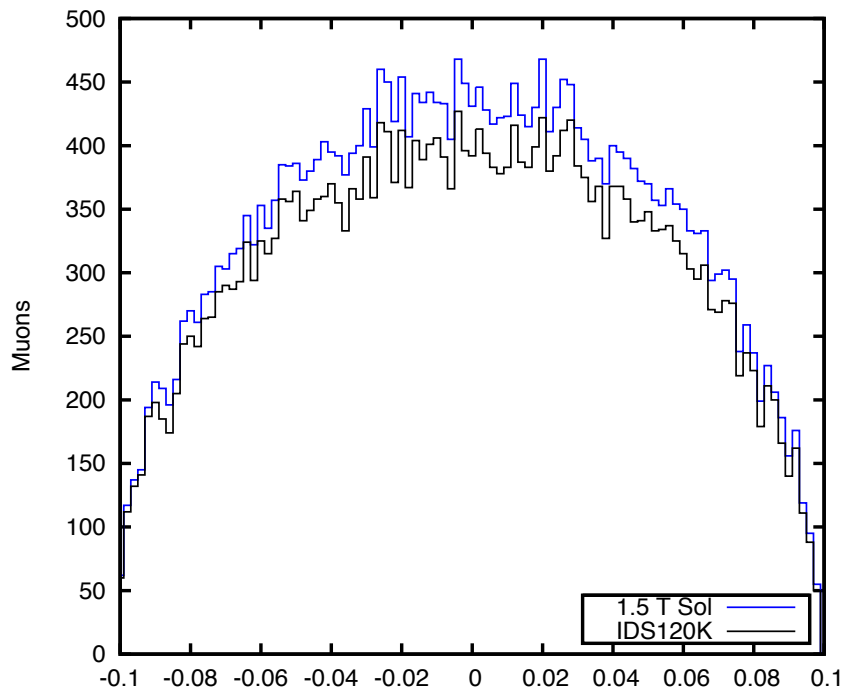
Dynamic Aperture



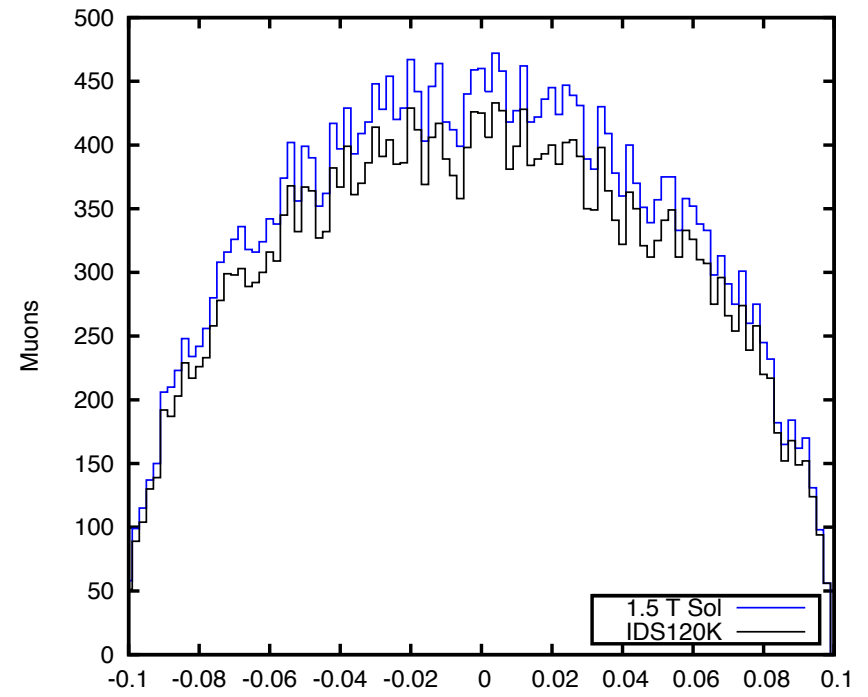
Low Energy (IDS120K)

8% loss





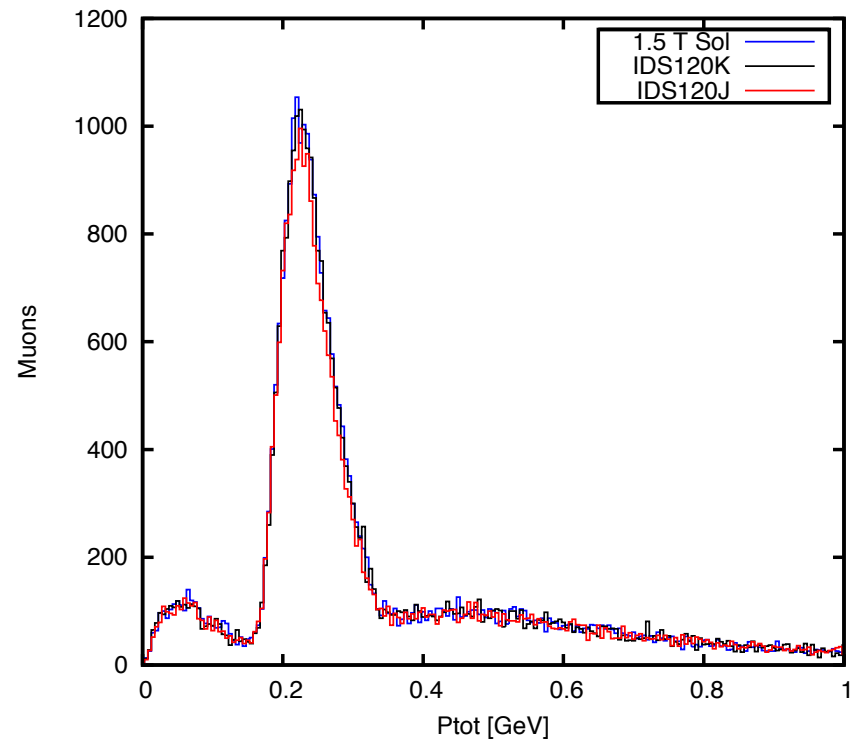
X [m]



Y [m]

IDS Standard Deck

IDS120J ~ 5% loss
IDS120K ~0.3% loss



IDS Standard Deck

