

# SOLENOID DECAY CHANNEL STUDY

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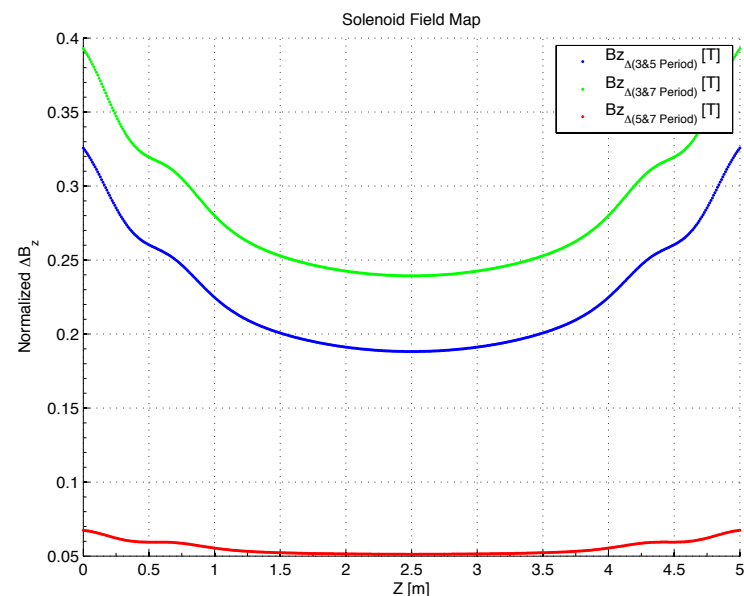
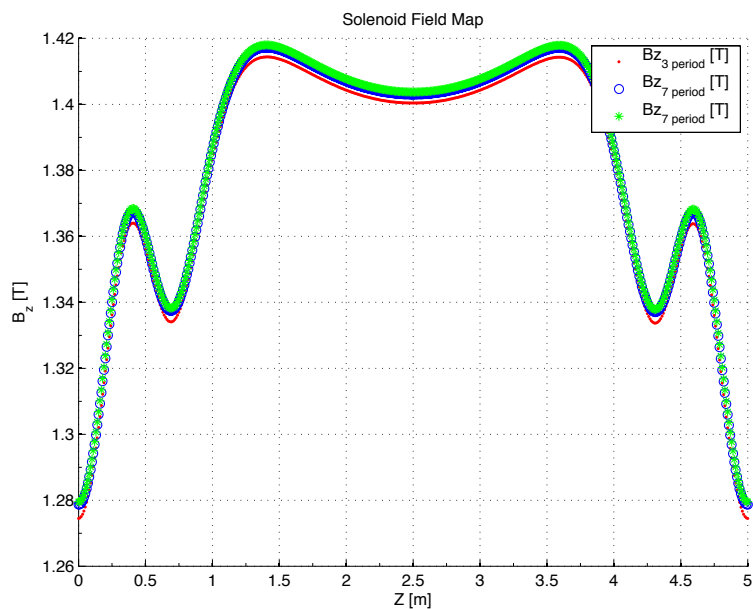
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# Decay Channel

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



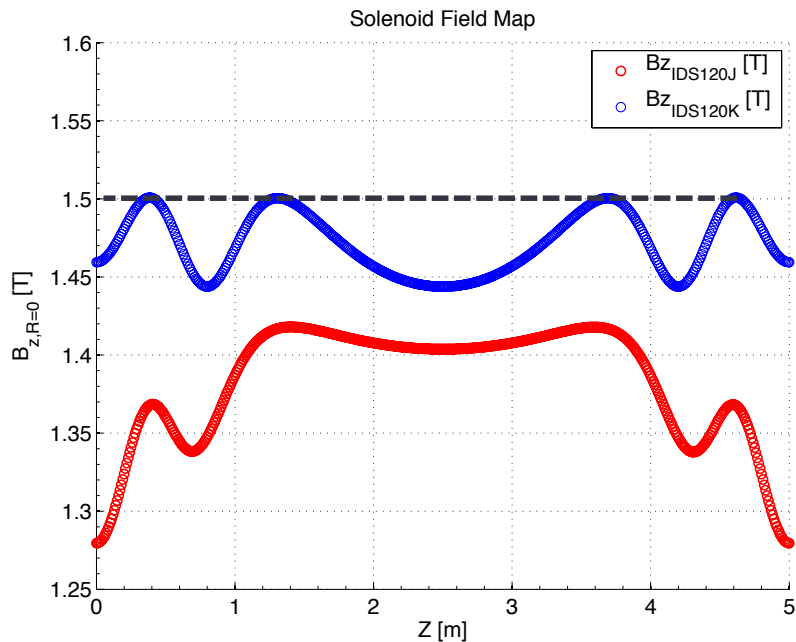
# IDS120J Solenoid Field Map (icool boundary conditions)



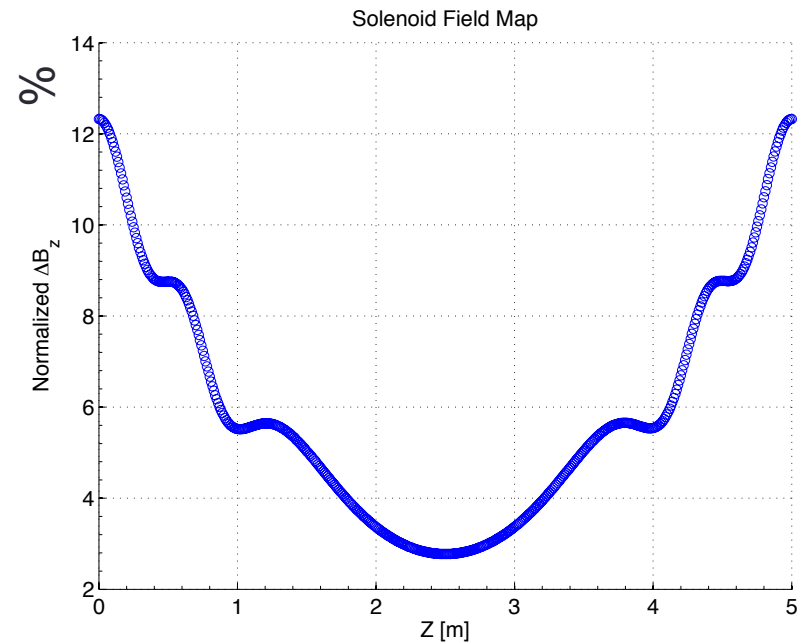
Length [m]	Inner R [m]	Outer R	Current [A/mm <sup>2</sup> ]
0.05	0.5	0.868	45.815
3.483	0.5	0.523	47.67
0.05	0.5	0.868	45.815

# Solenoid Field Map (IDS120K(J))

## On Axis Field



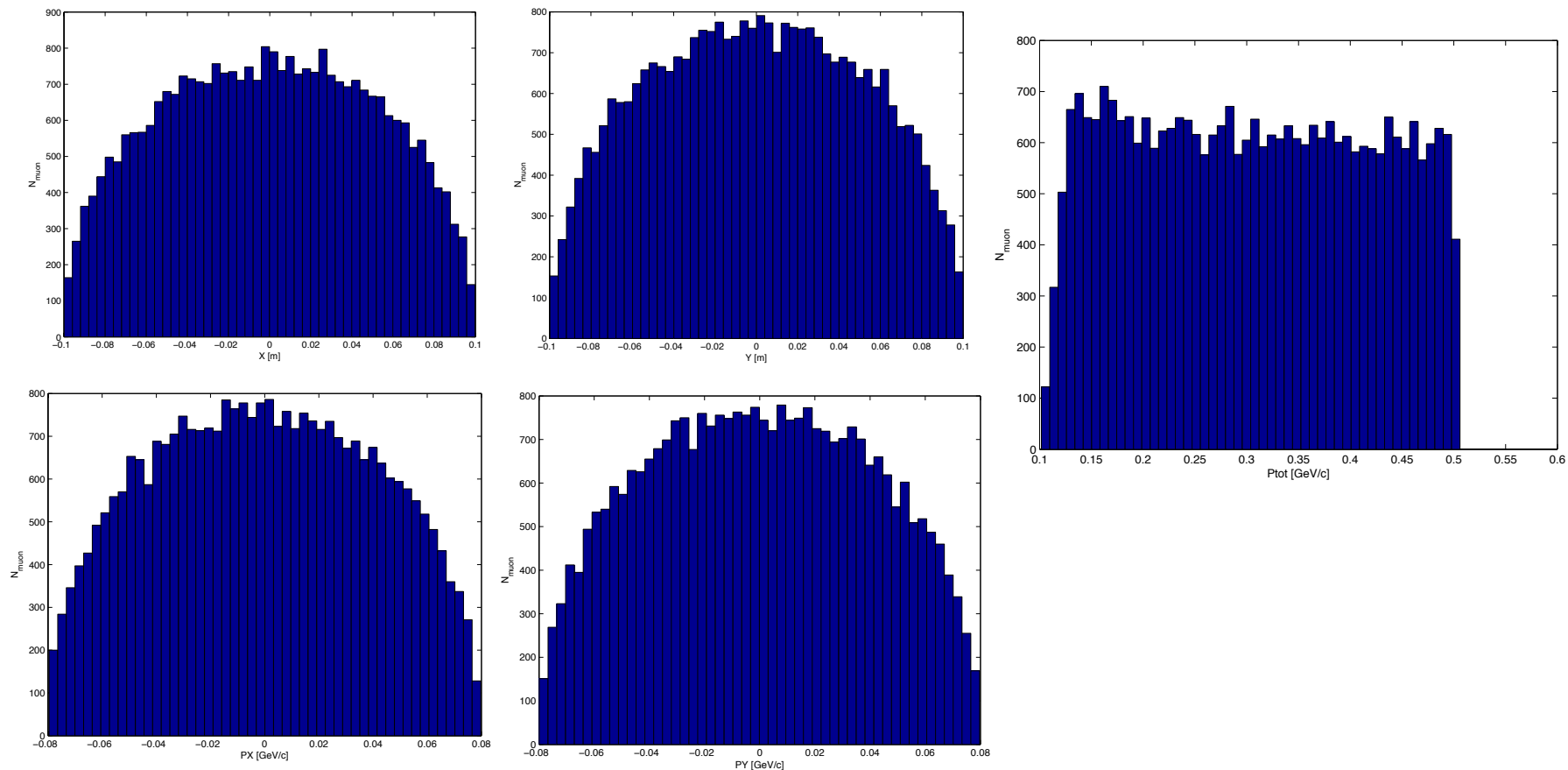
## Normalized $\Delta(120J,120K)$



# Initial Particle Distribution

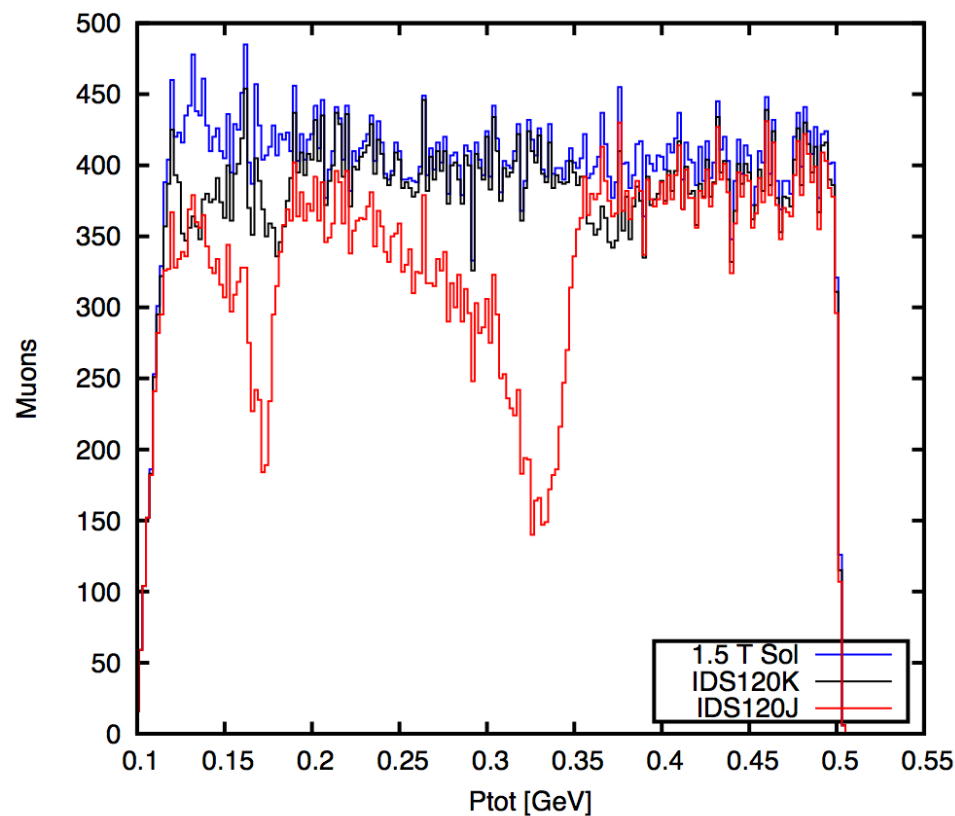
## PARTICLE GENERATIONS by ICOOL

$R_{low} = 0.0$   $R_{high} = 0.1$  [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]  
 $P_{z_{high}} = 0.5$

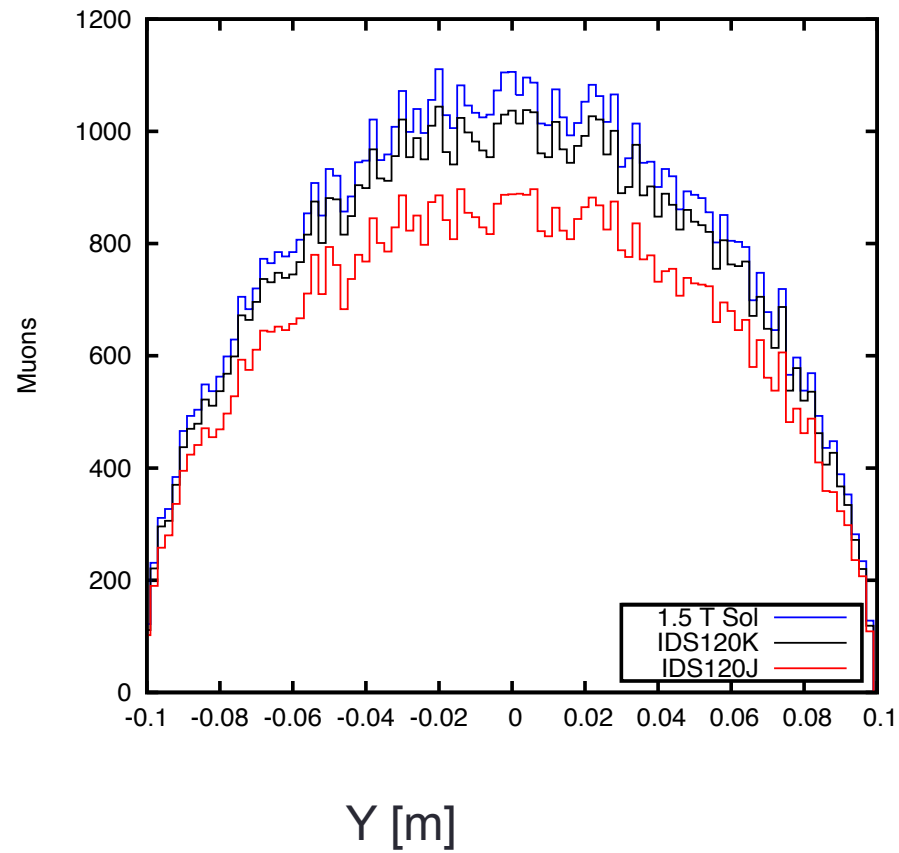
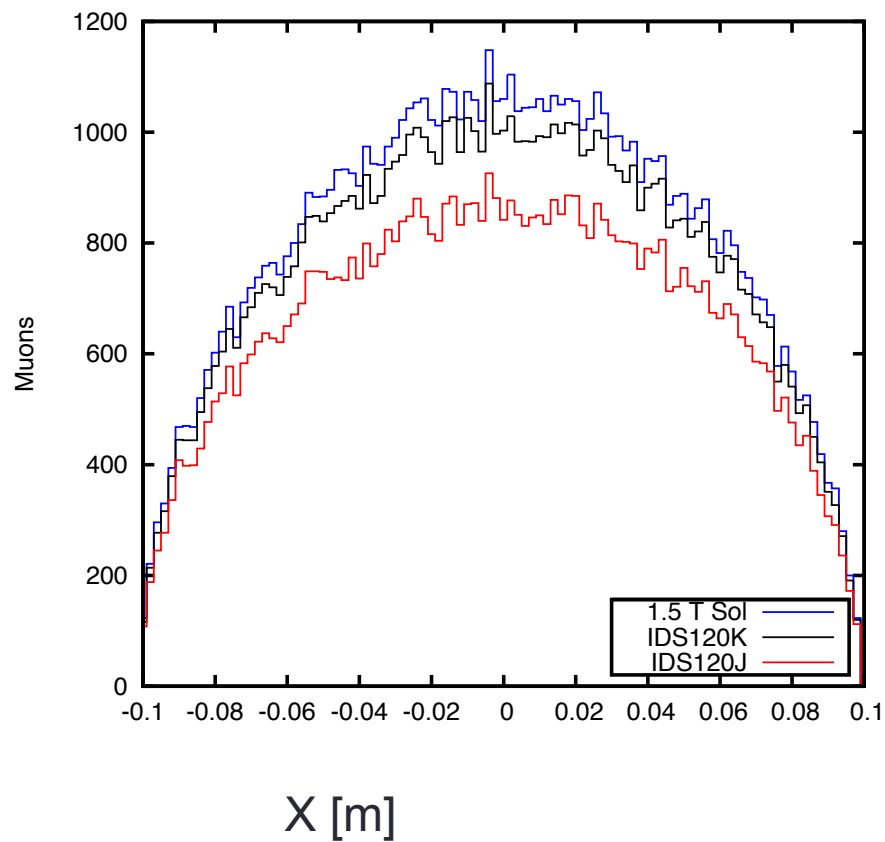


# Particle Tracking

- 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%)

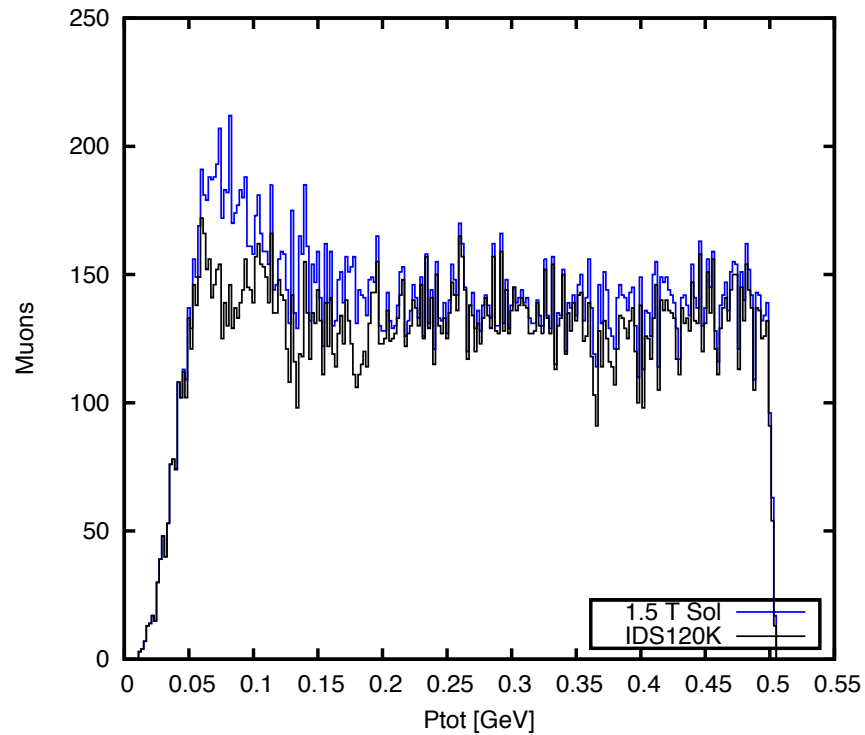


# Dynamic Aperture

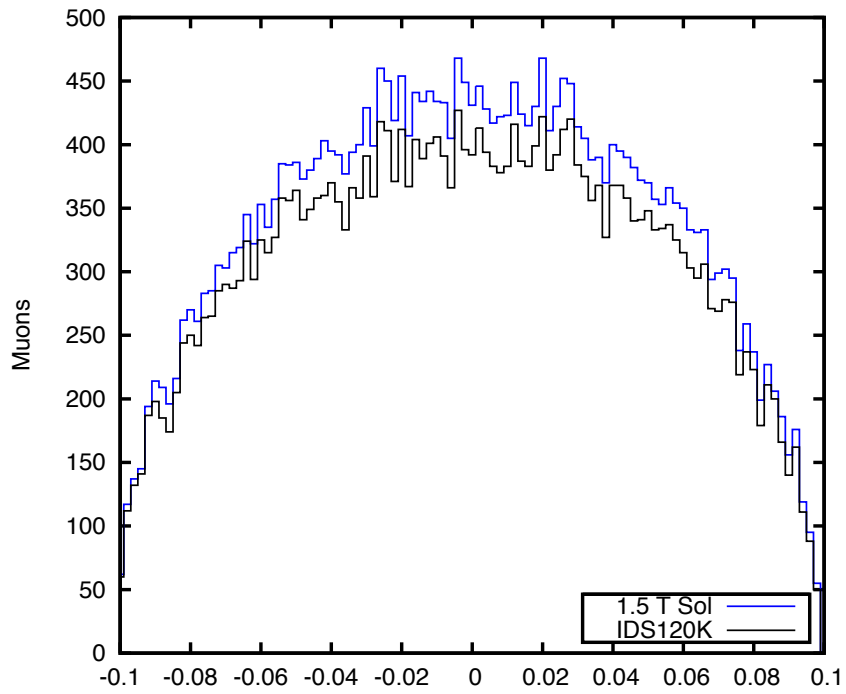


# Low Energy (IDS120K)

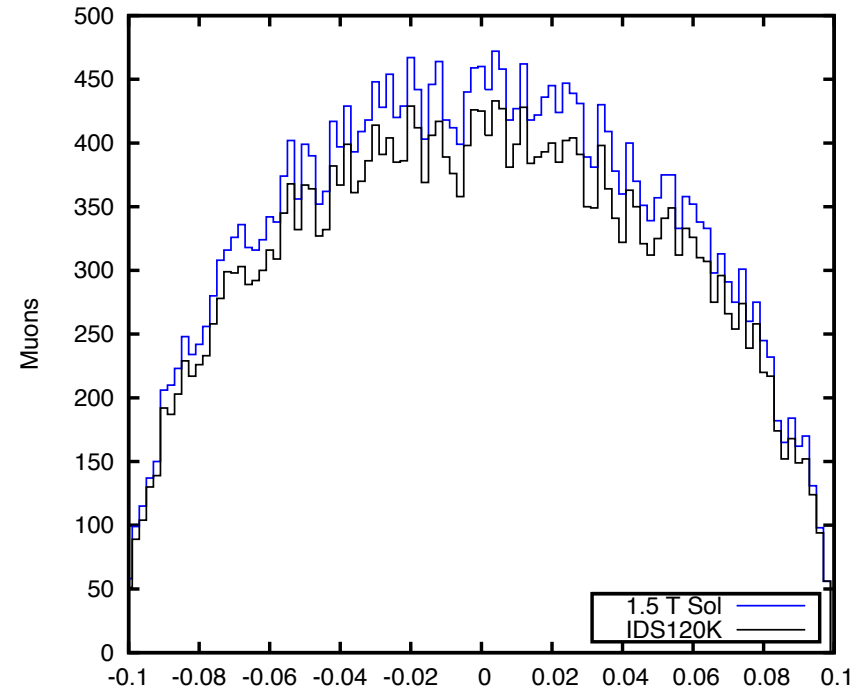
8% loss







X [m]



Y [m]