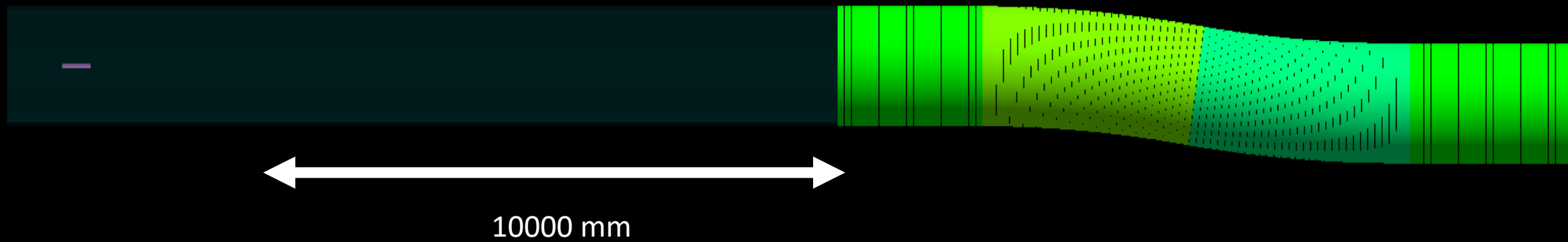
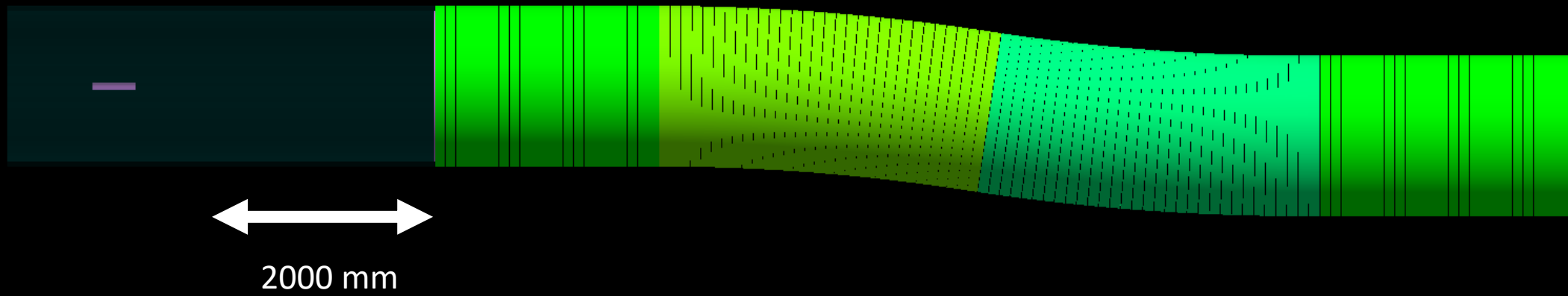
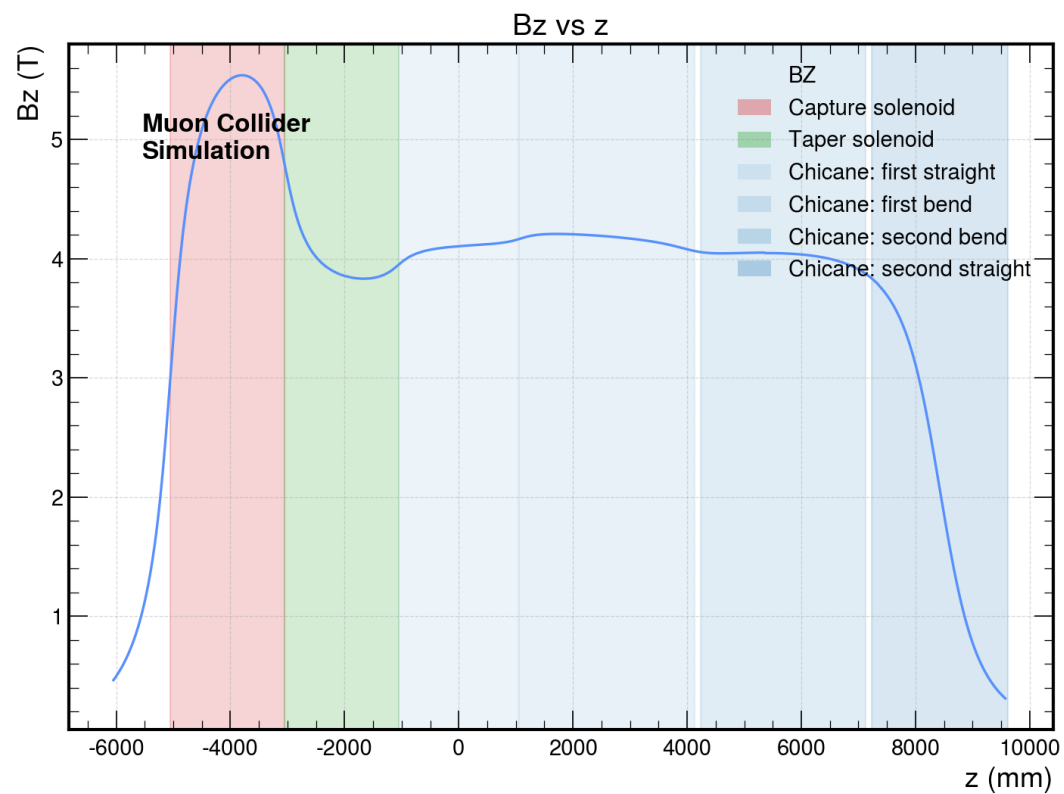


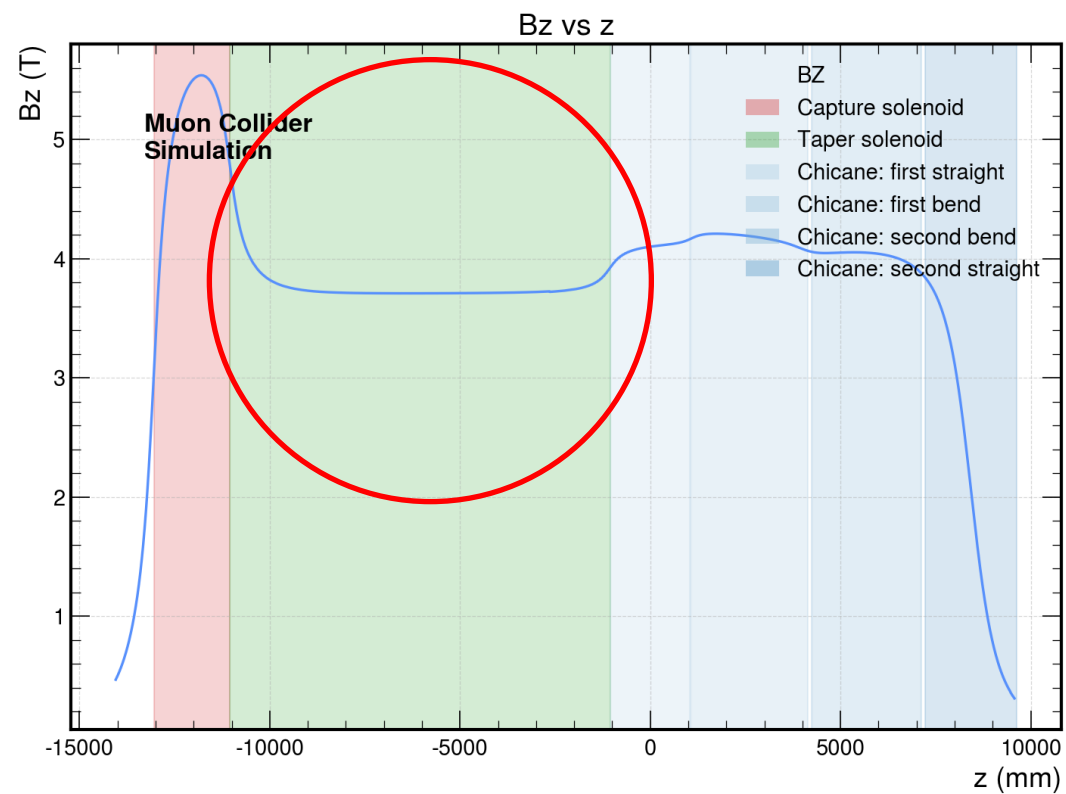
Studies on Muon Collider's Target with G4Beamline (10/20/2025)

Cheng-Hsu (Bryan) Nee

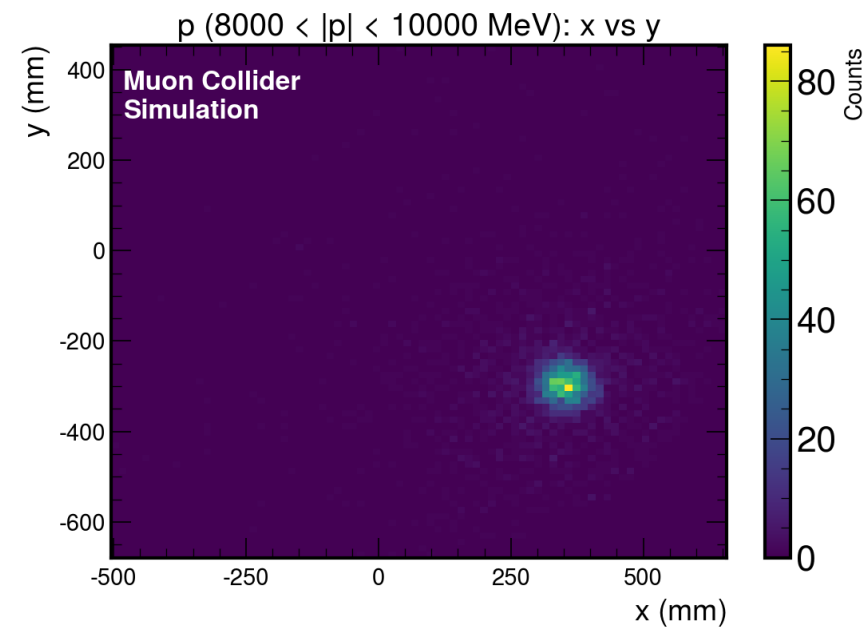
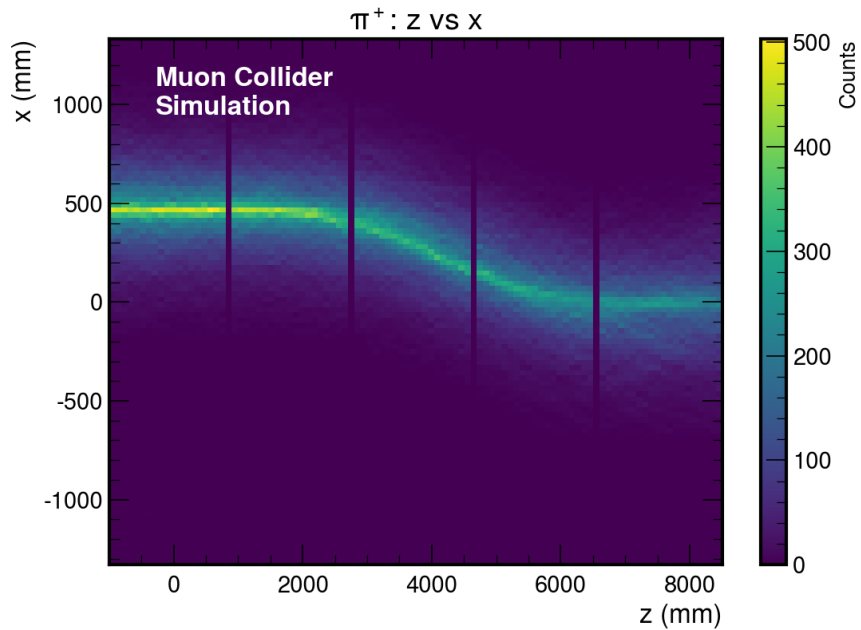
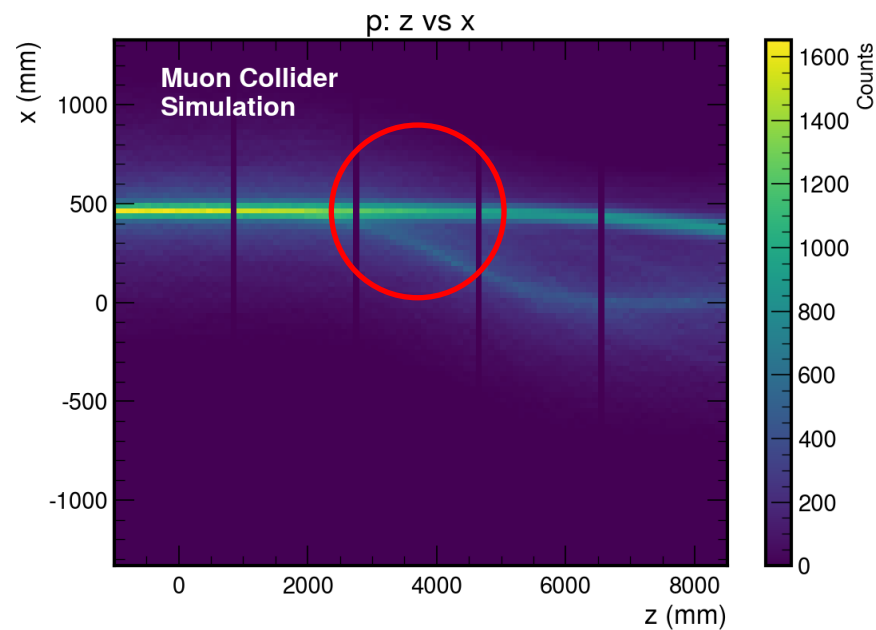
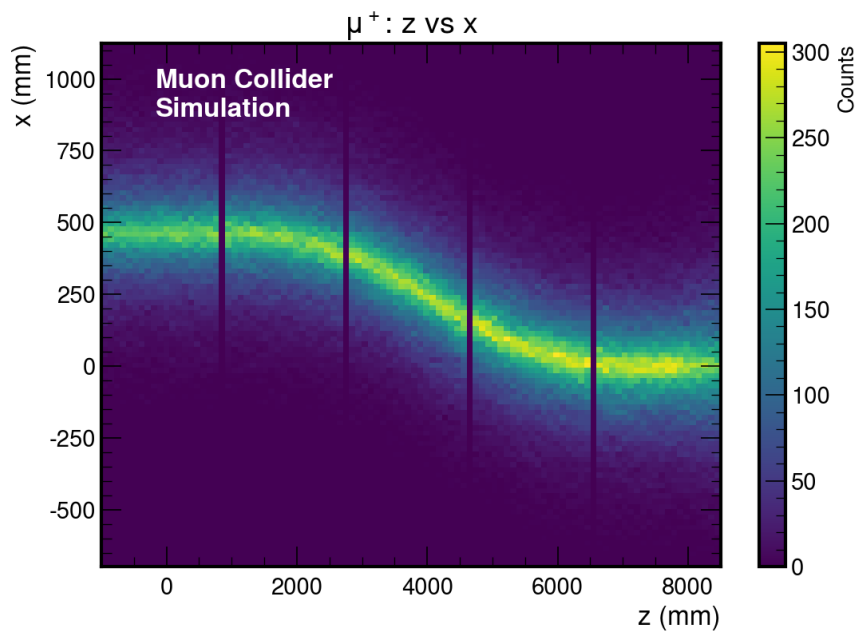


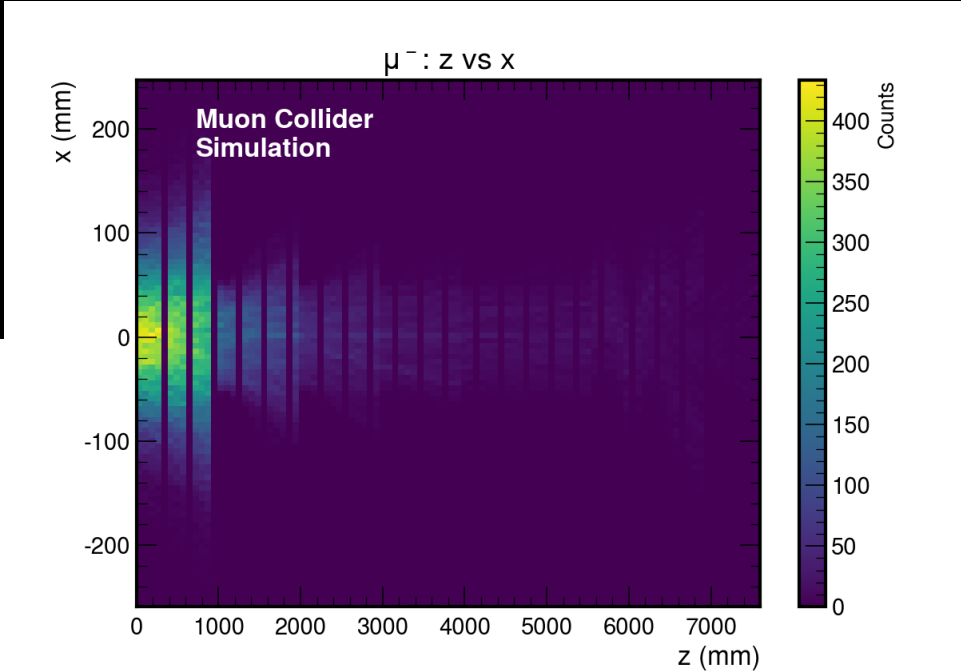
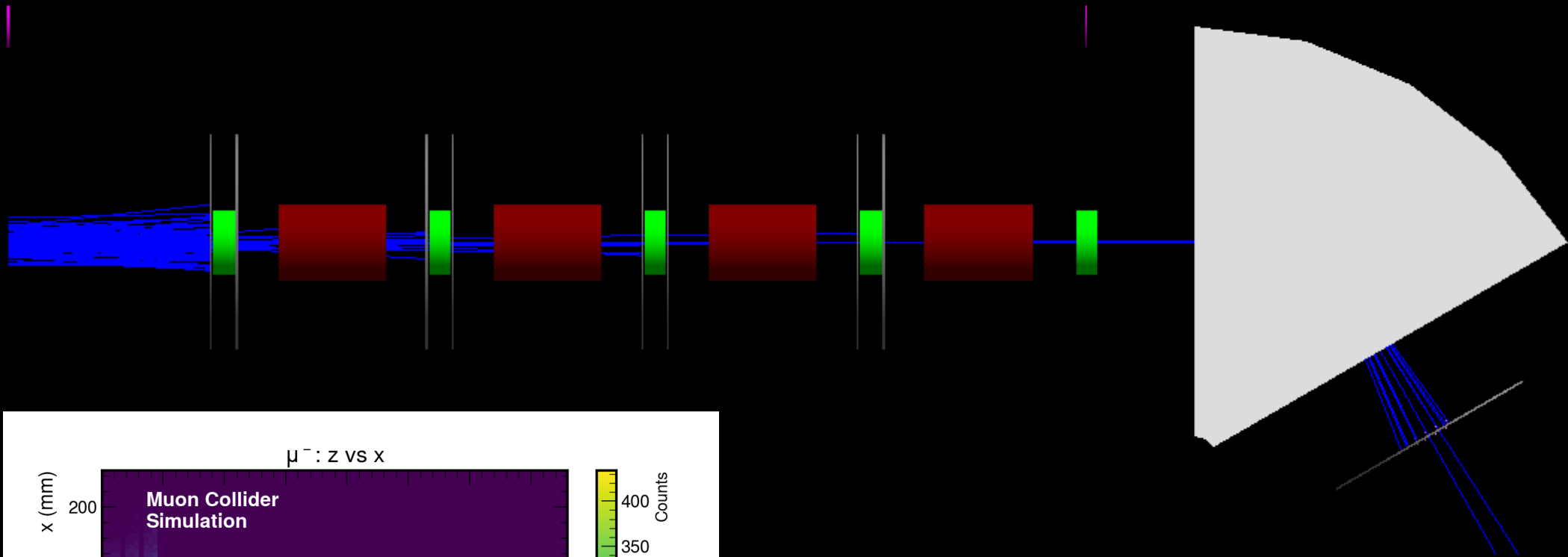


Short Taper Solenoid (2000mm)



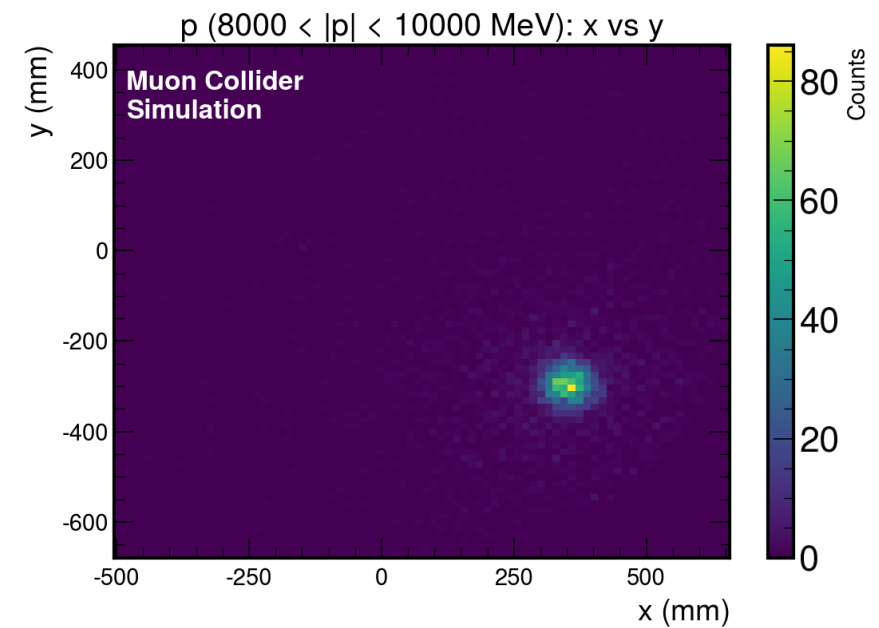
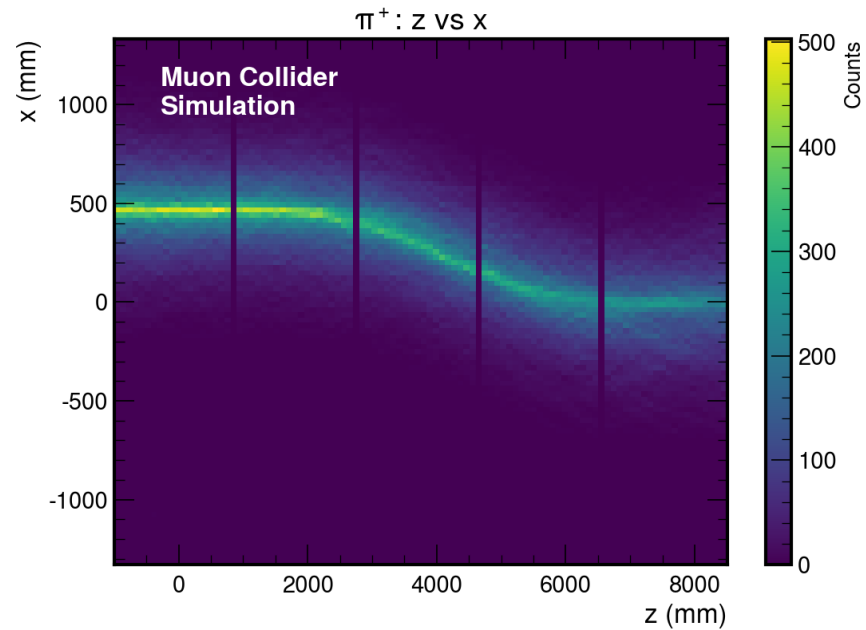
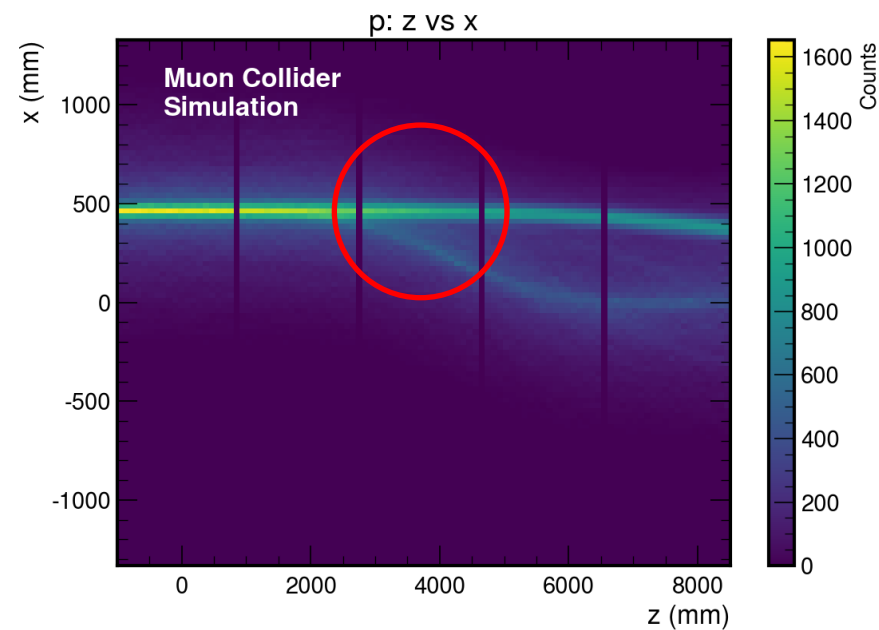
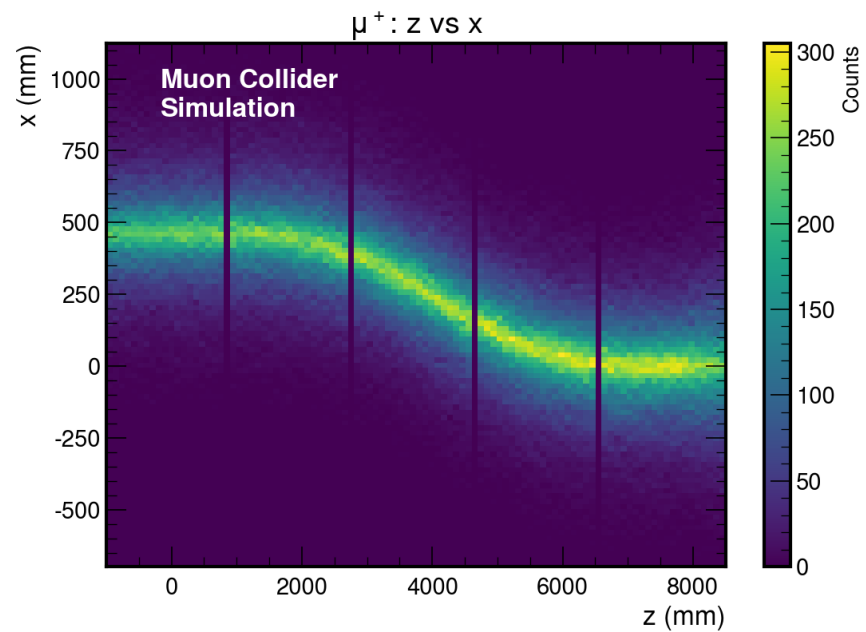
Long Taper Solenoid (10000mm)



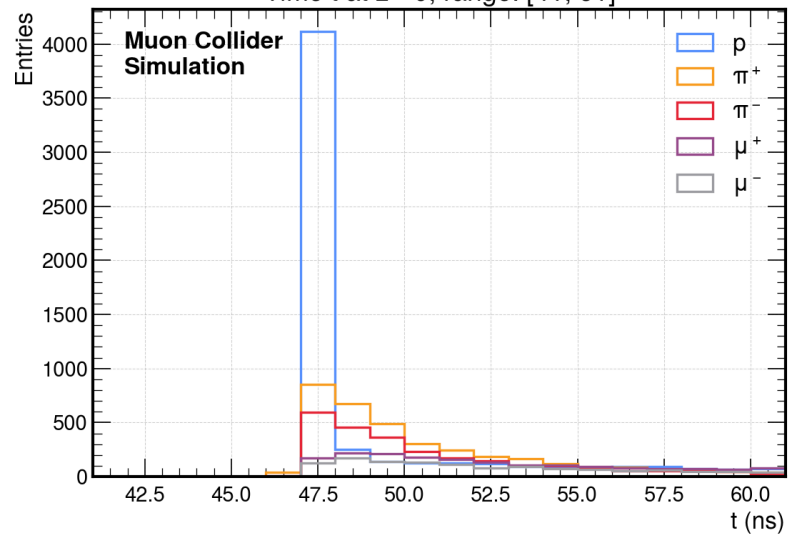


Preparation section before cooling for the demonstrator:

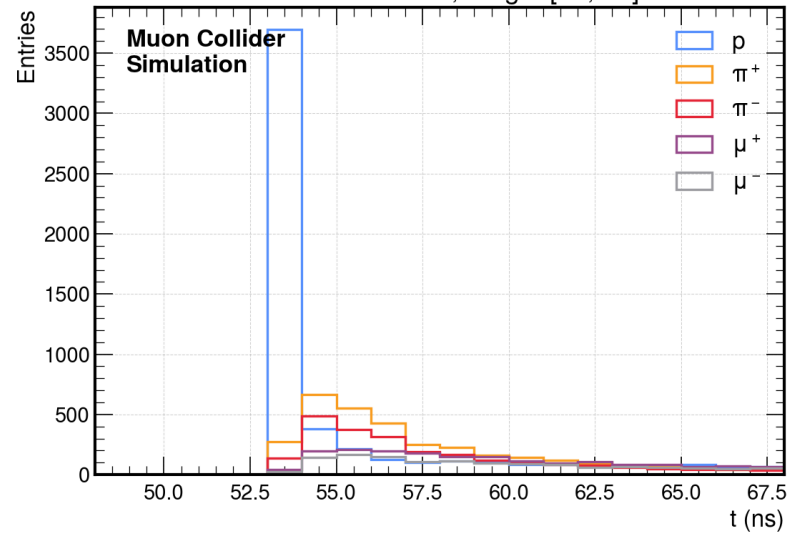
- Using dipole, meant to only cool one charge.



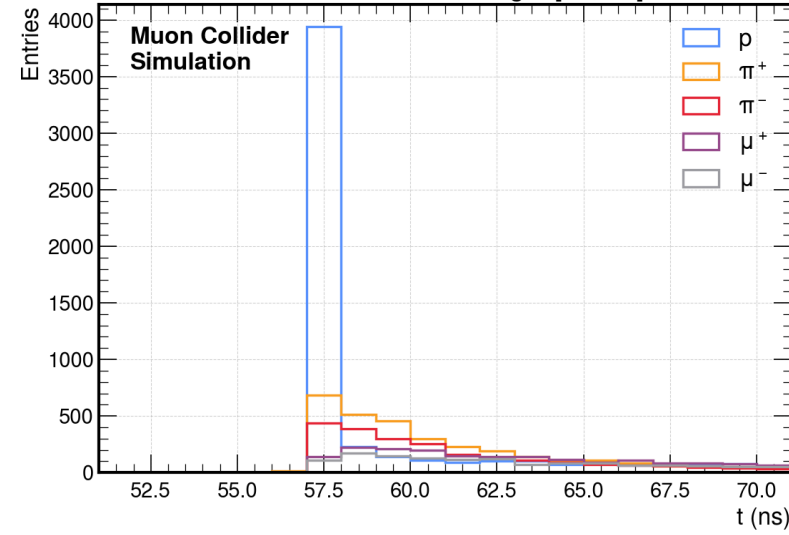
Time t at z = 0; range: [41, 61]



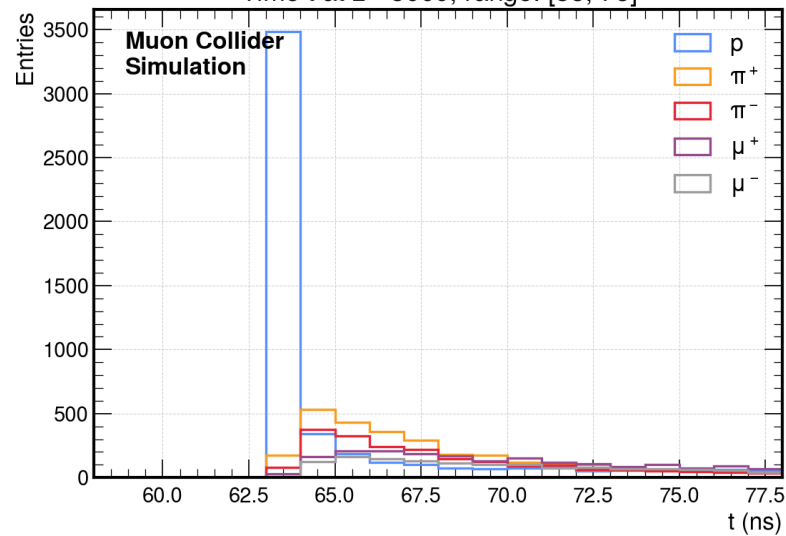
Time t at z = 2000; range: [48, 68]



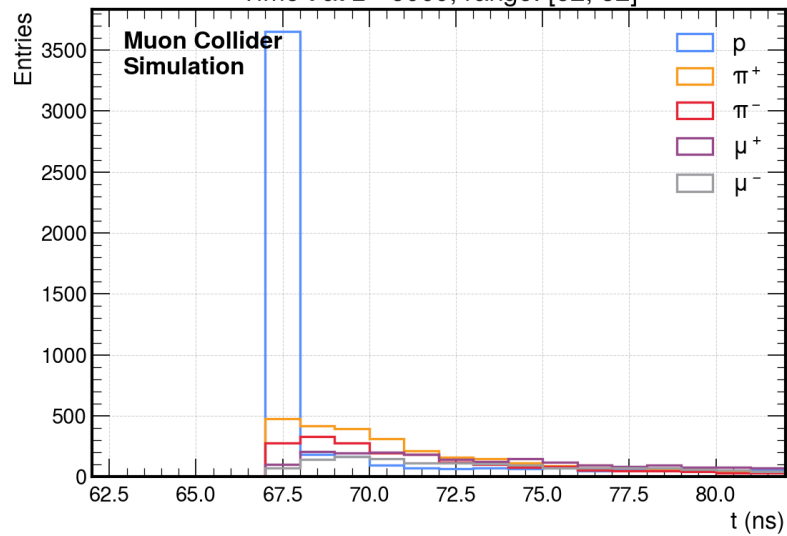
Time t at z = 3000; range: [51, 71]



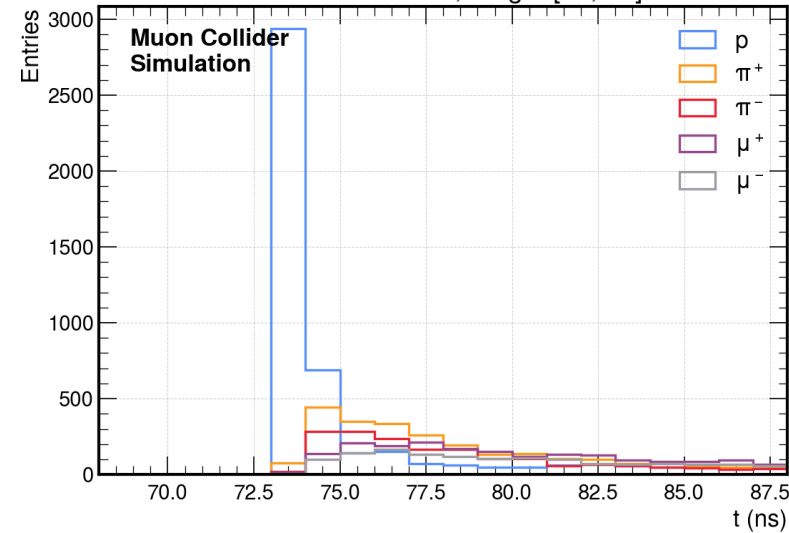
Time t at z = 5000; range: [58, 78]

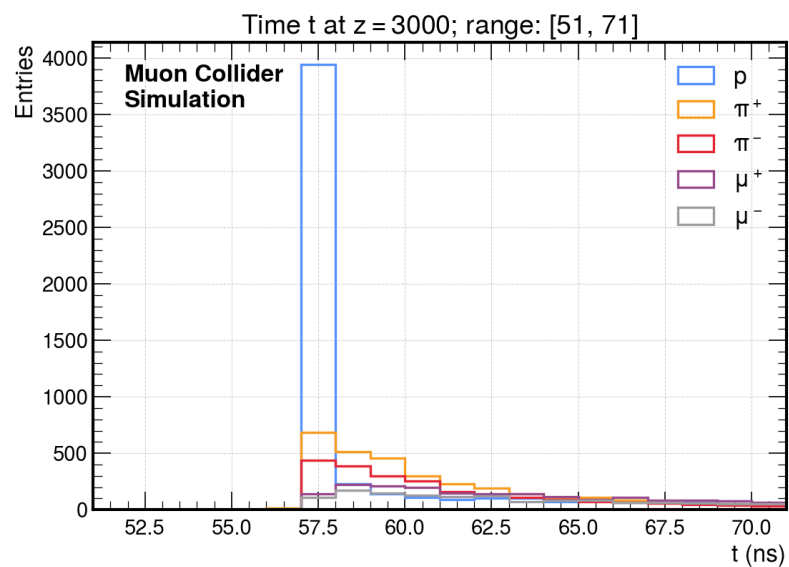
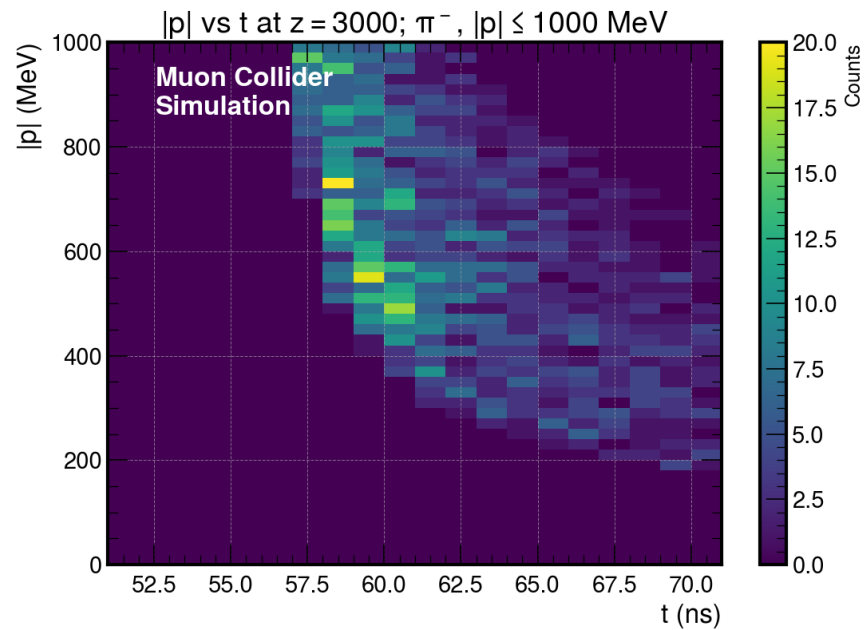
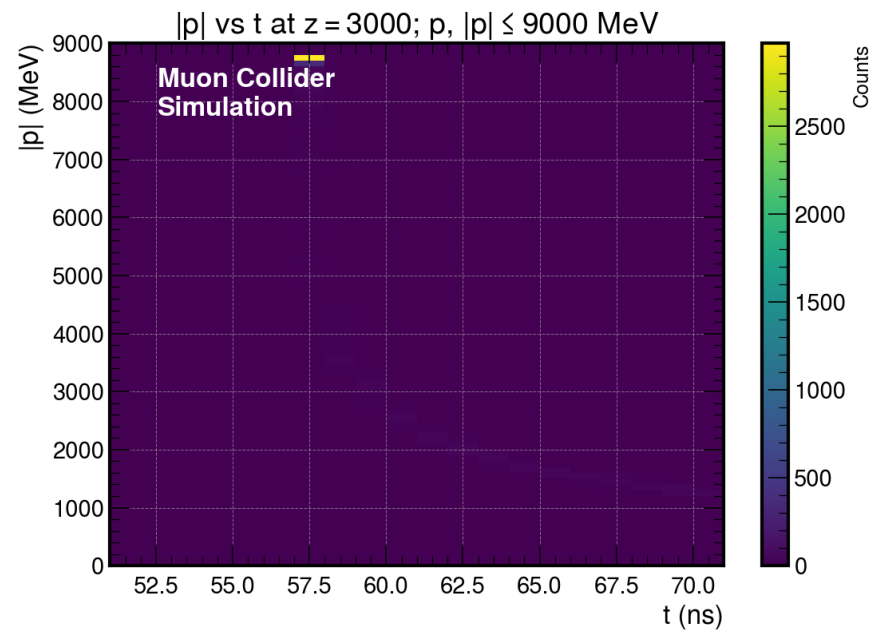
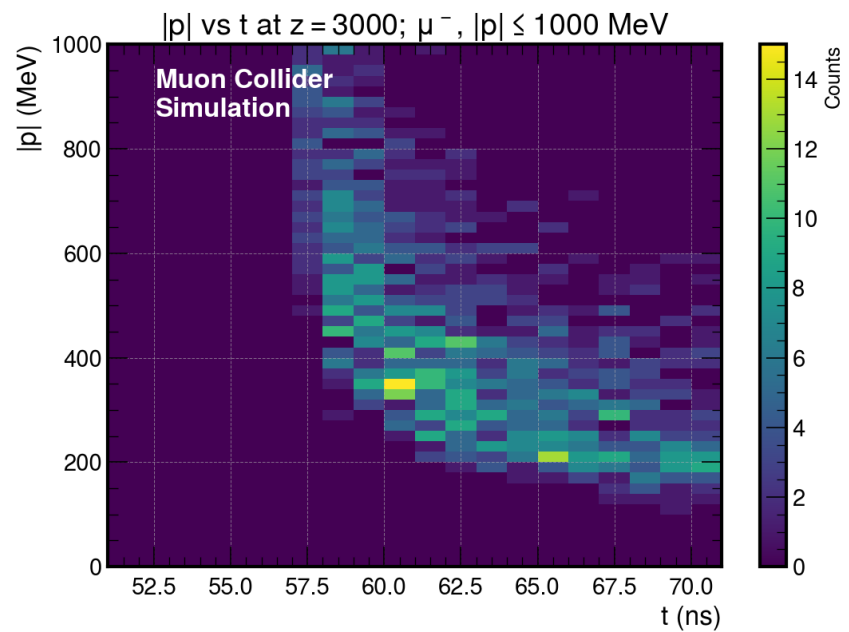
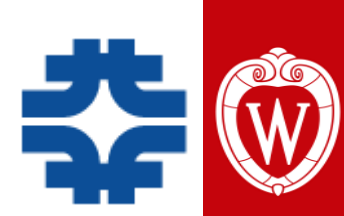


Time t at z = 6000; range: [62, 82]

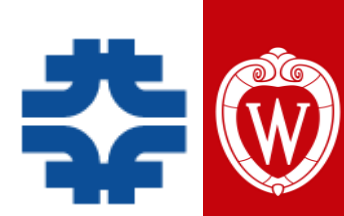


Time t at z = 8000; range: [68, 88]

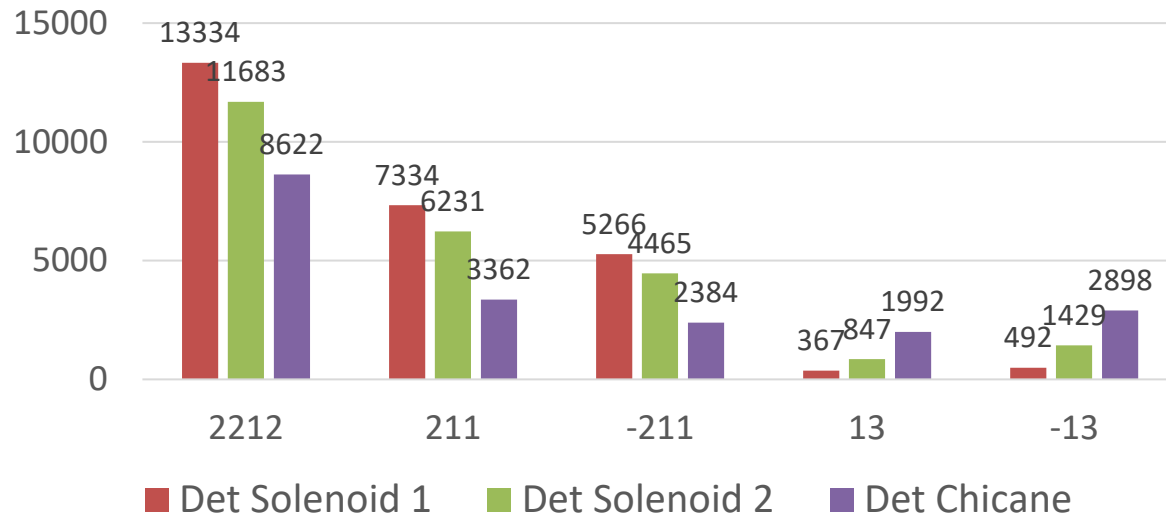








Particle Counts



2000 mm Taper Solenoid

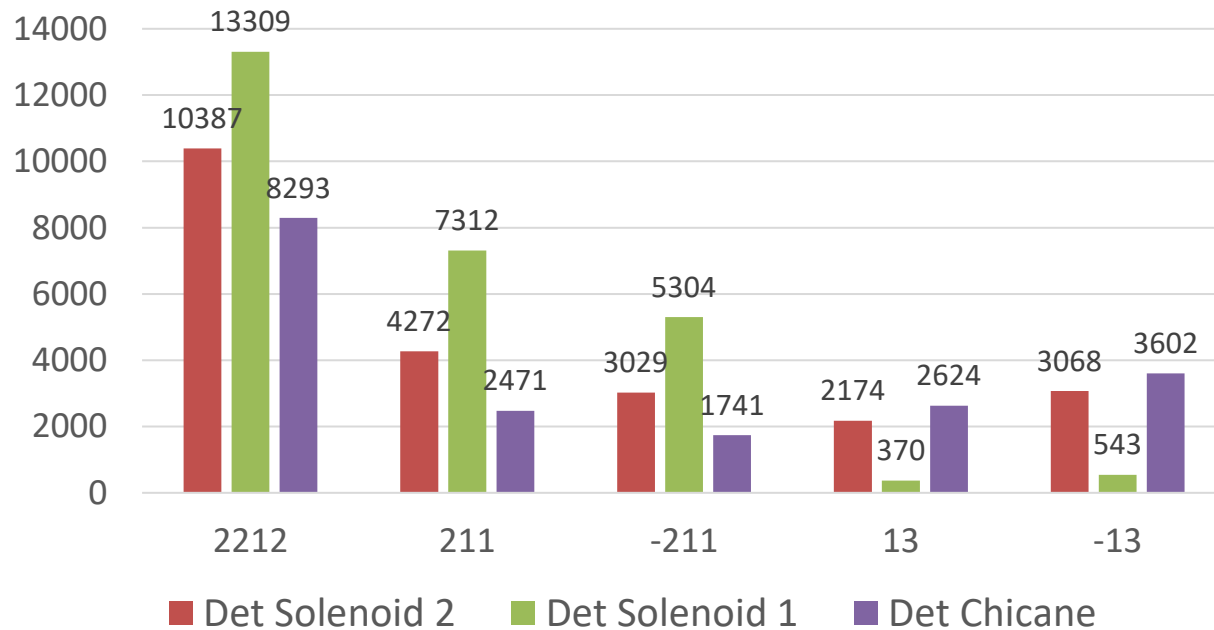
$p = 10000$

Det Solenoid 1: $(\mu + \pi) / p = 135\%$

Det Solenoid 2: $(\mu + \pi) / p = 129\%$

Det Chicane: $(\mu + \pi) / p = 106\%$

Particle Counts



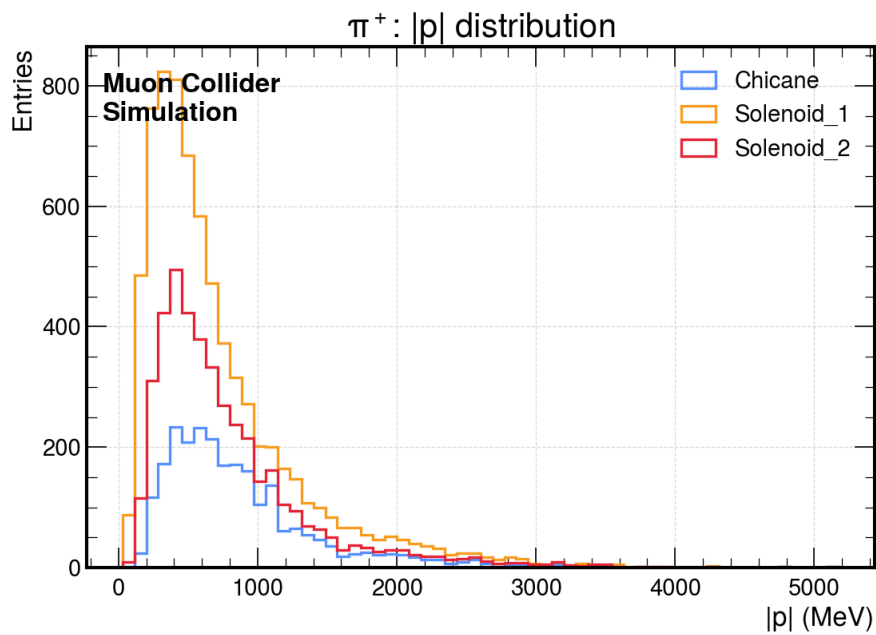
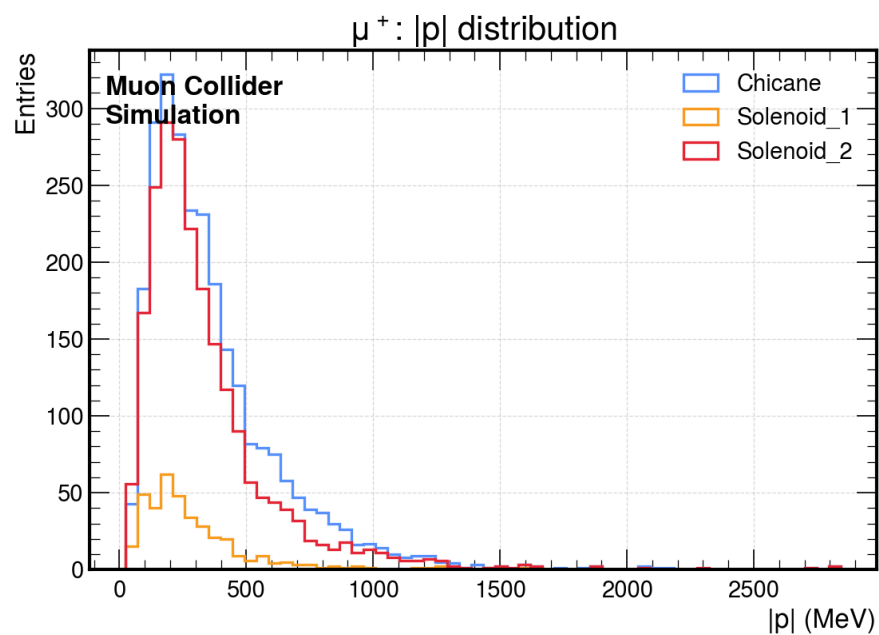
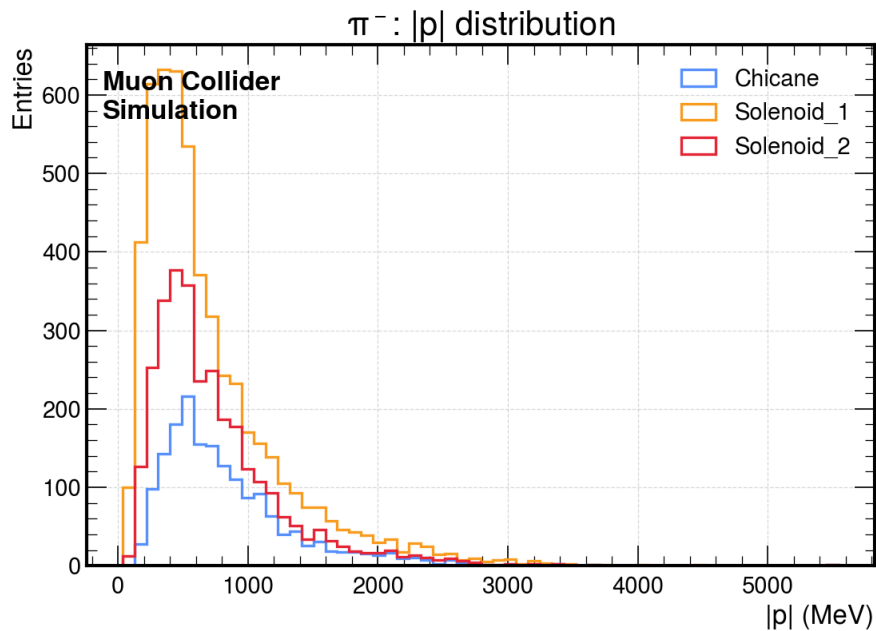
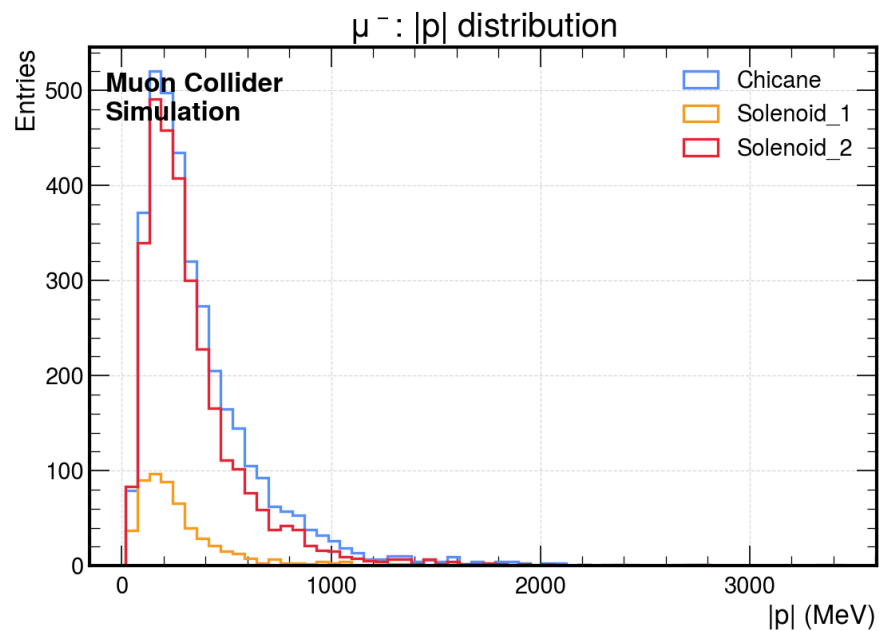
10000 mm Taper Solenoid

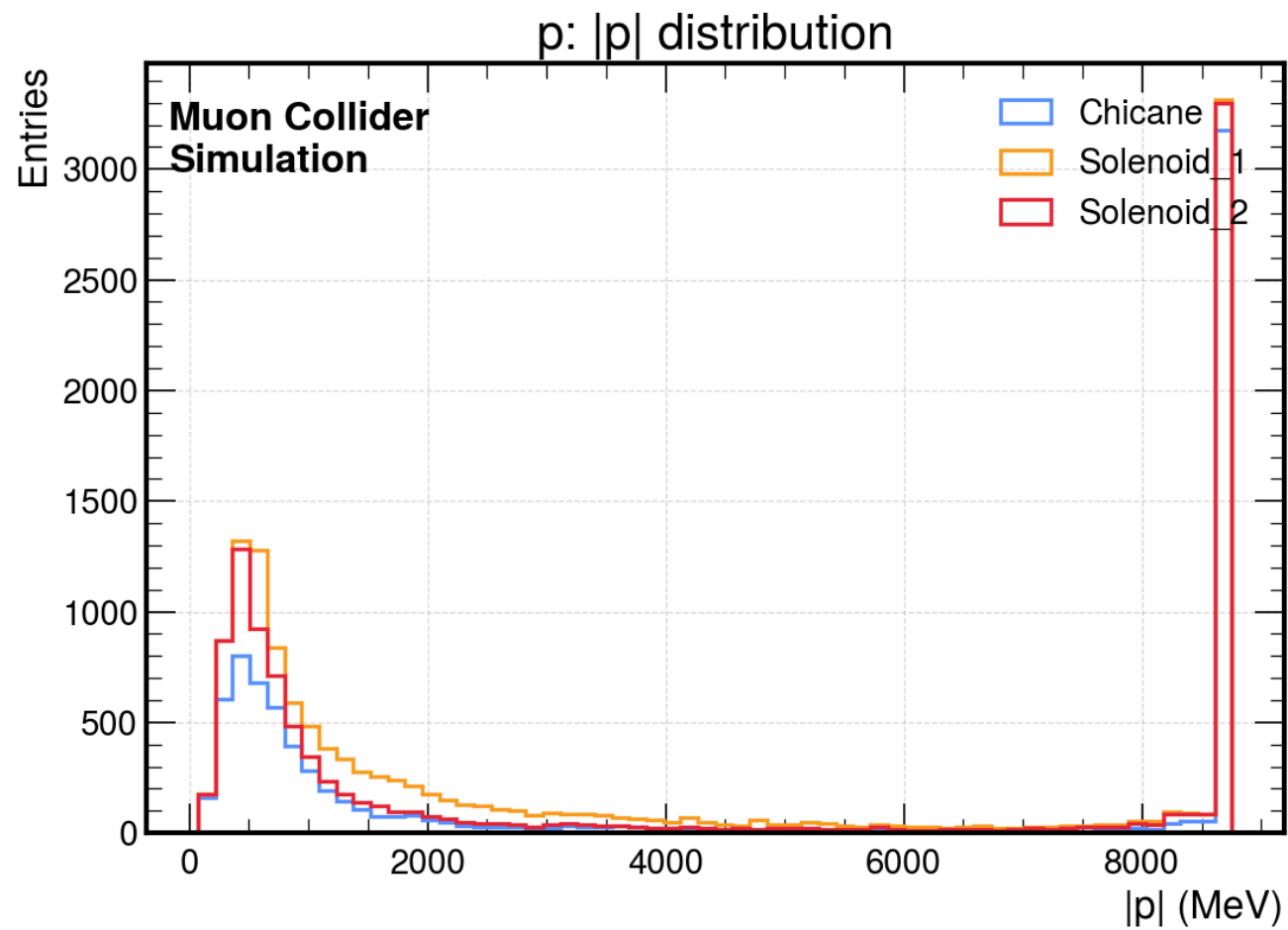
$p = 10000$

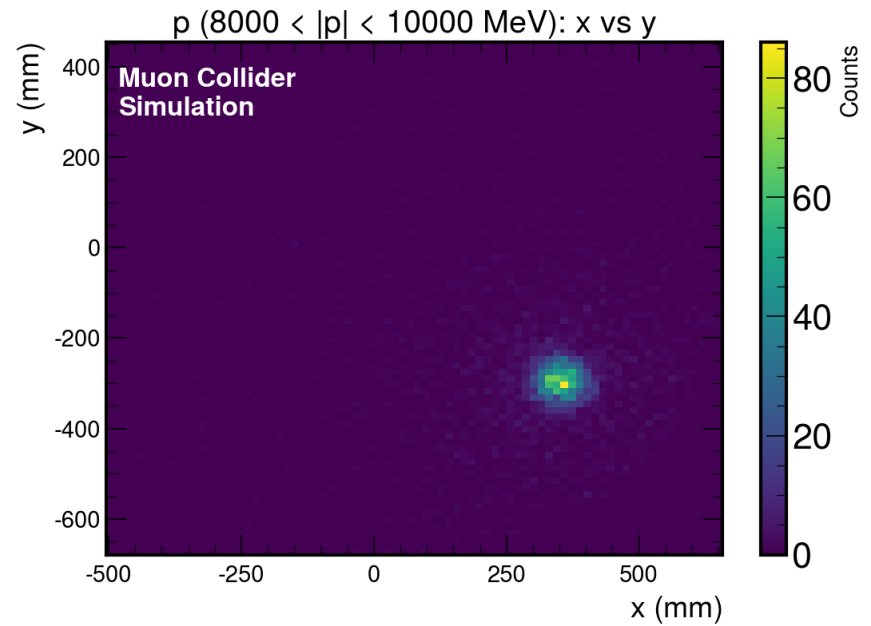
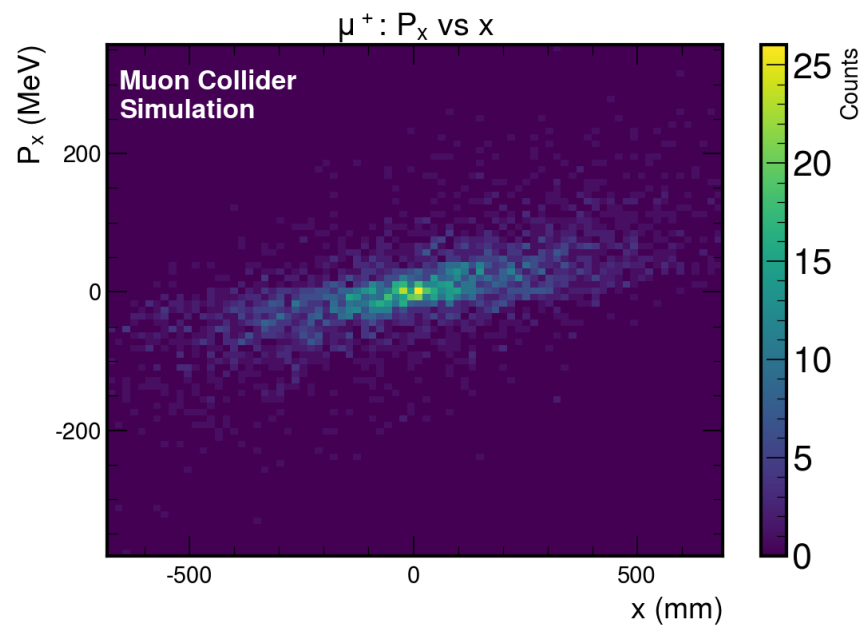
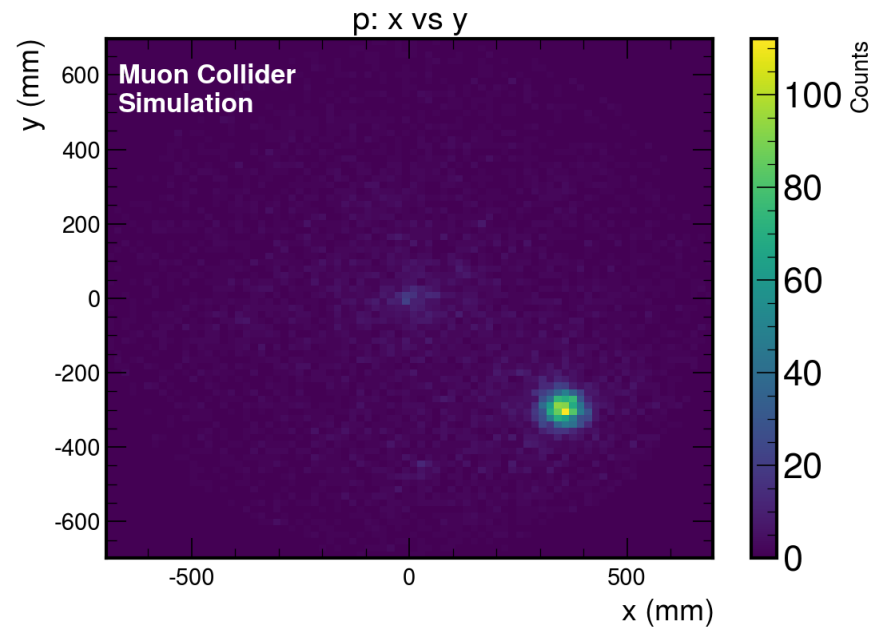
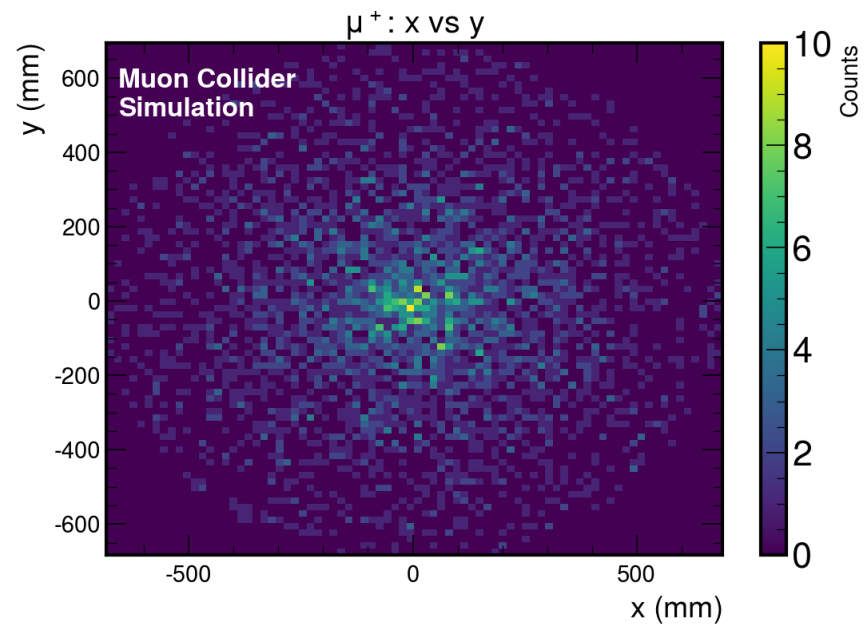
Det Solenoid 1: $(\mu + \pi) / p = 135\%$

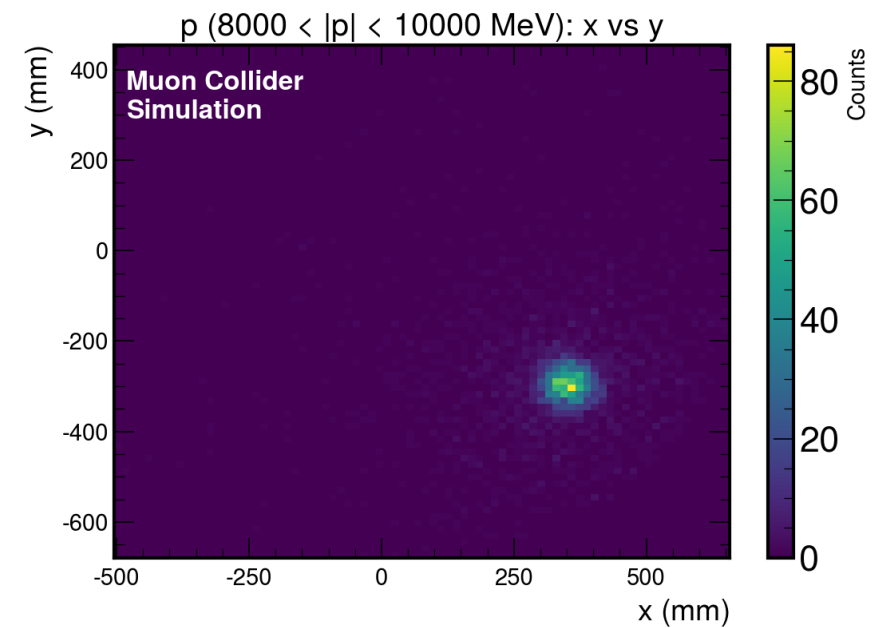
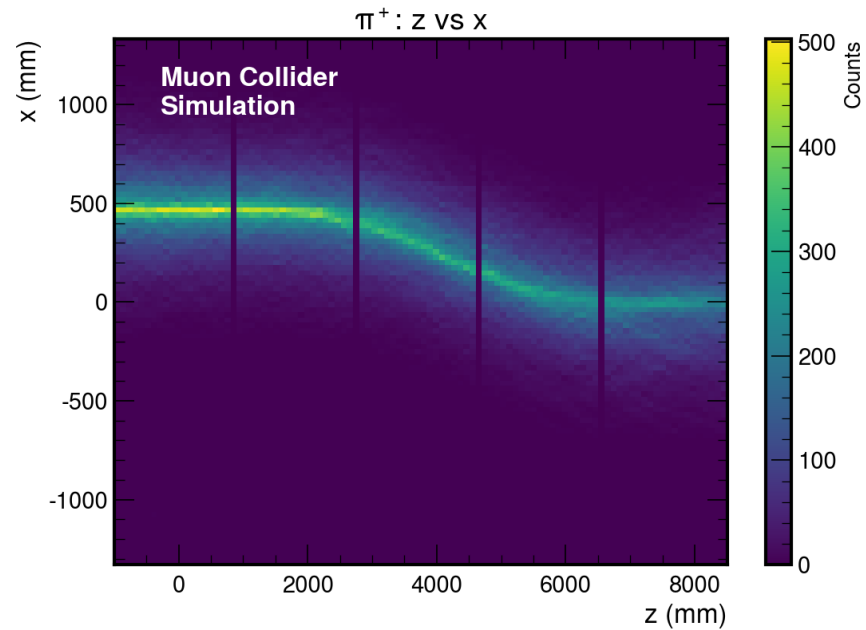
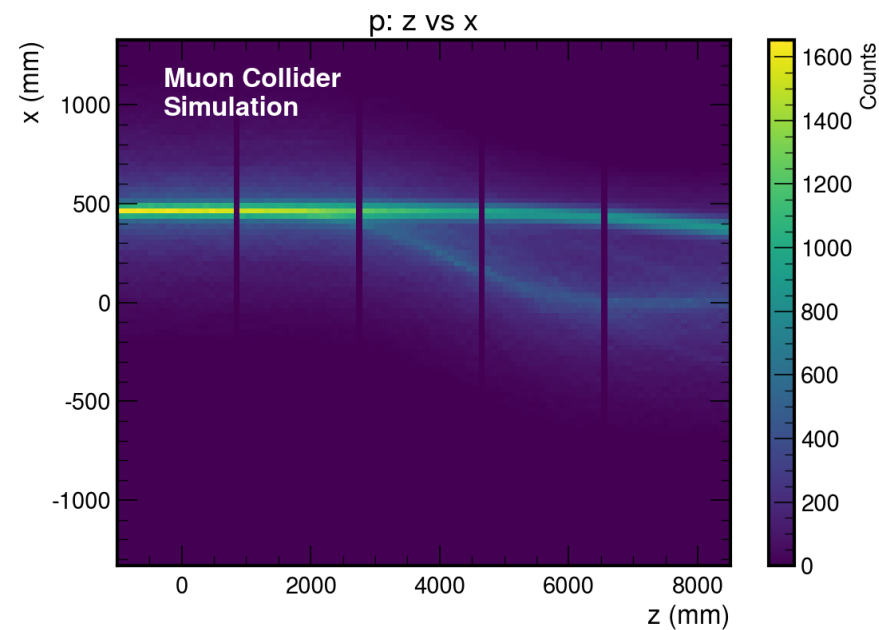
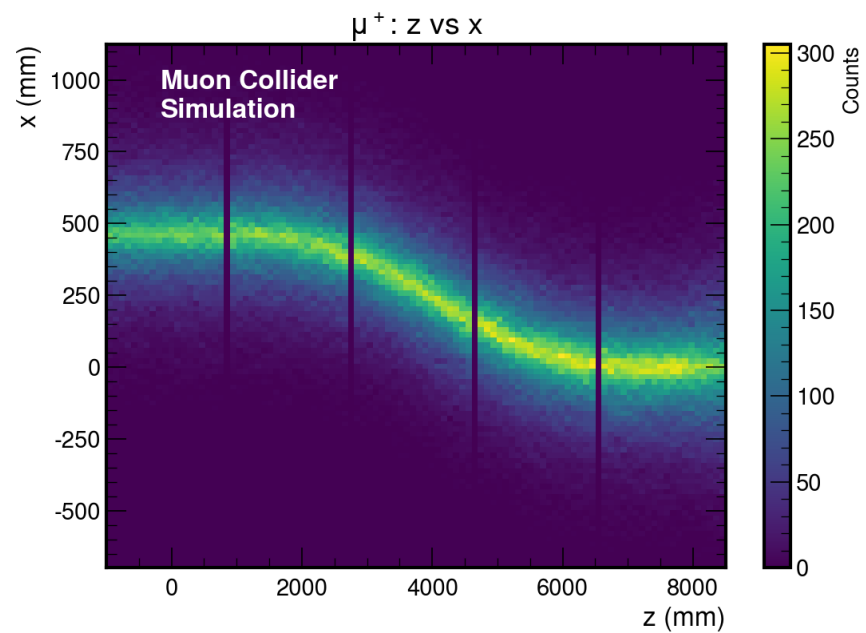
Det Solenoid 2: $(\mu + \pi) / p = 125\%$

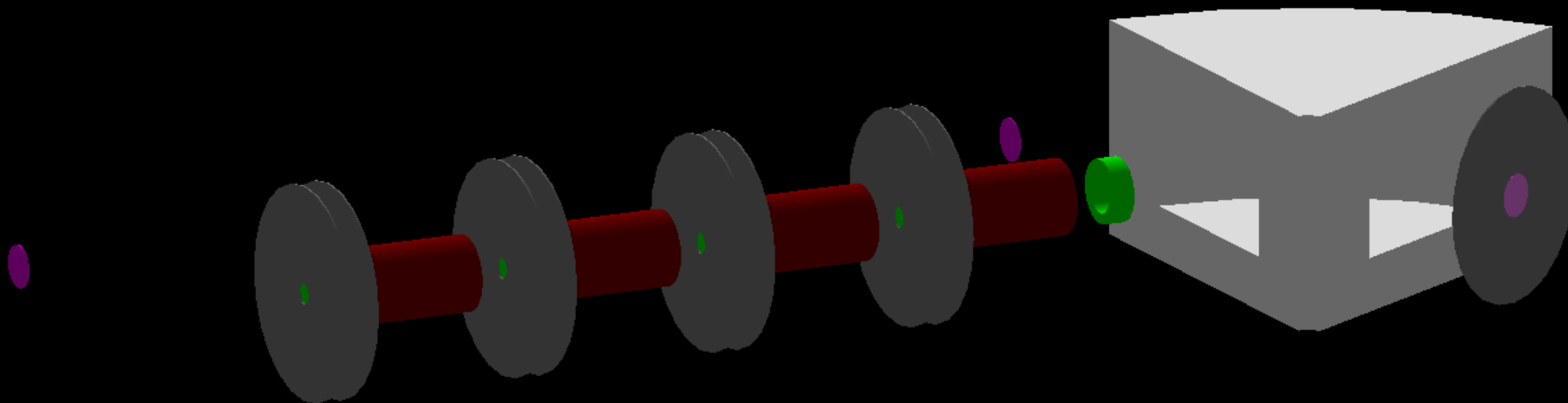
Det Chicane: $(\mu + \pi) / p = 104\%$



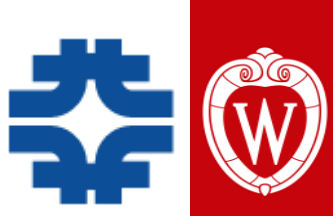




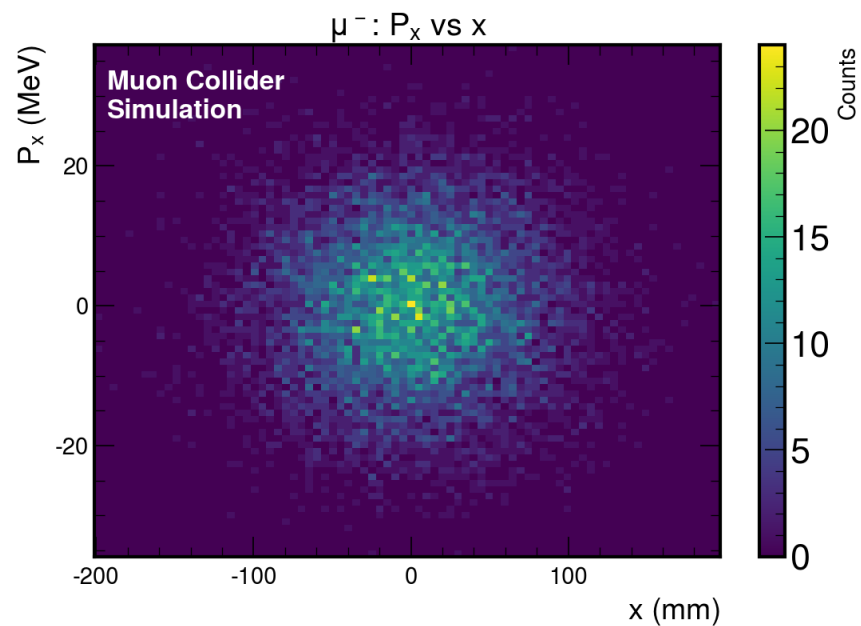
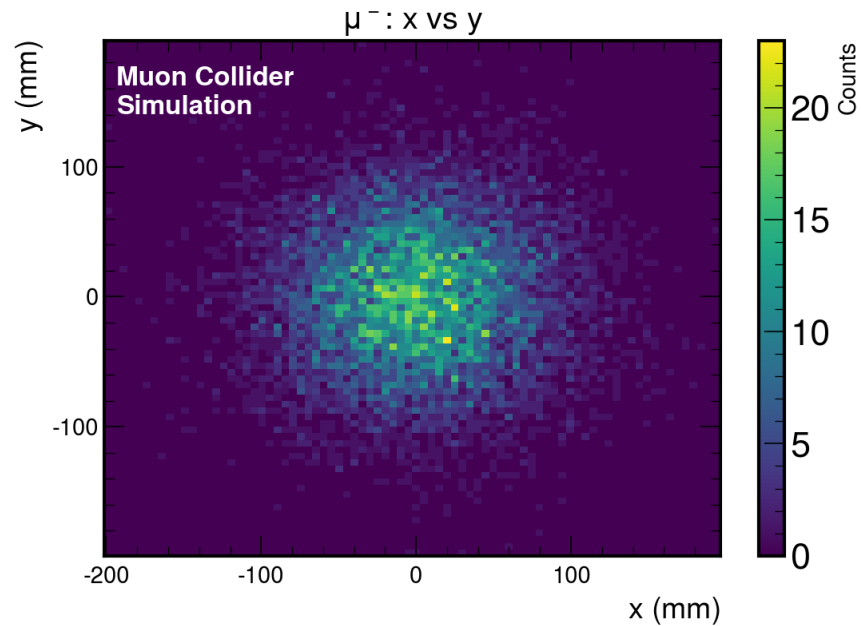
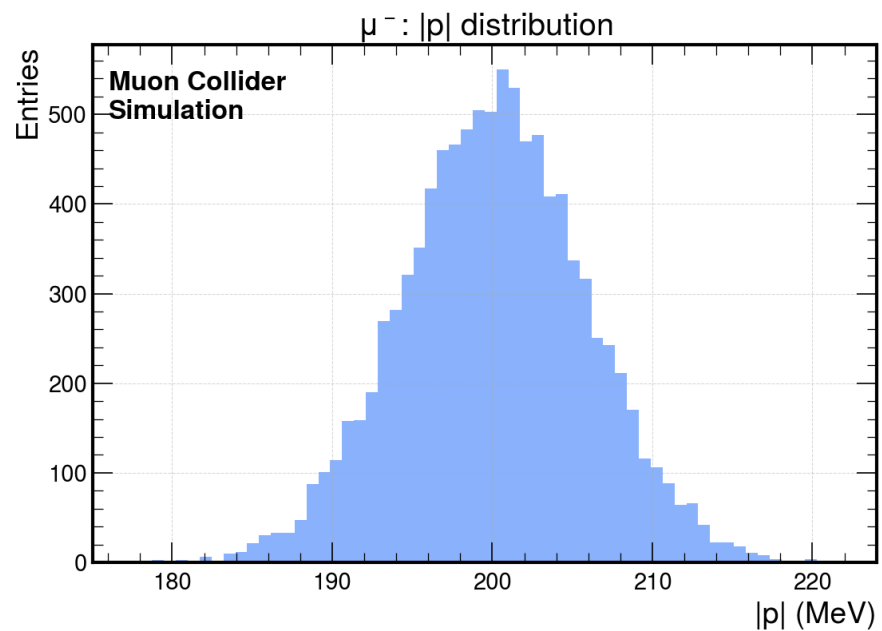




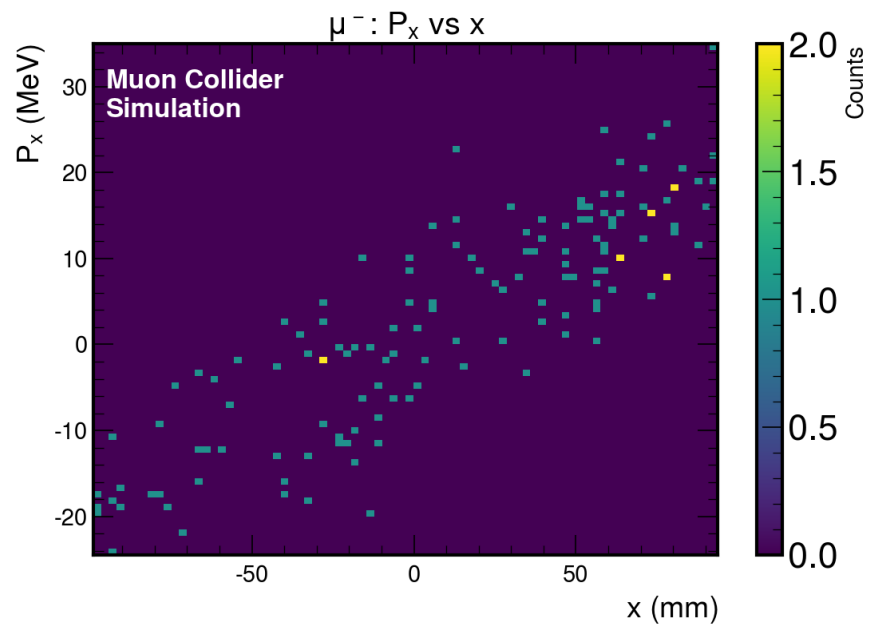
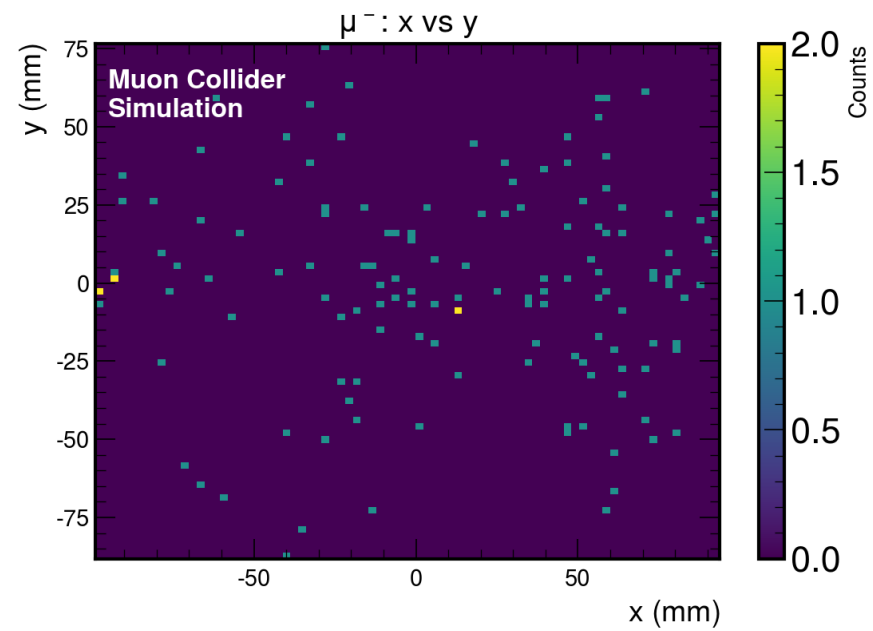
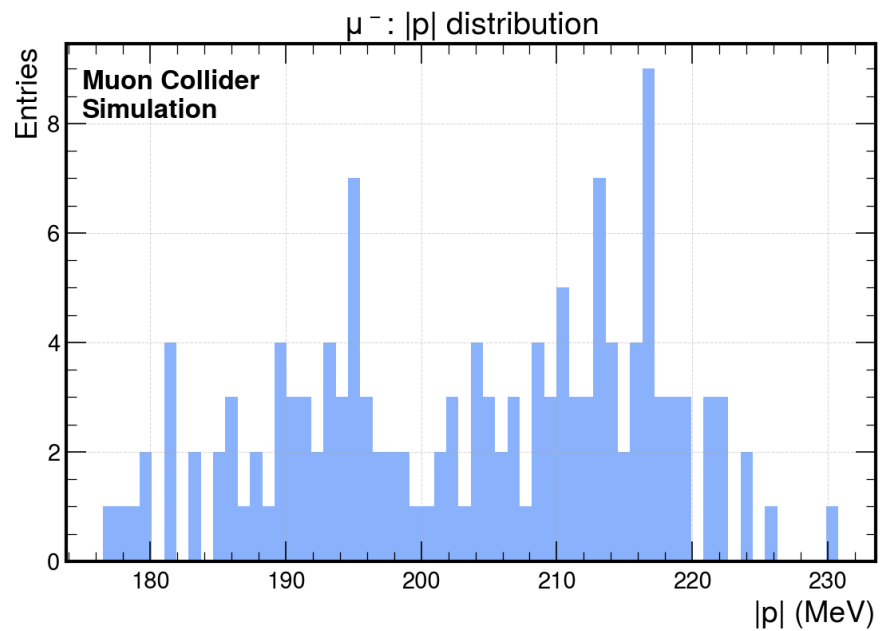
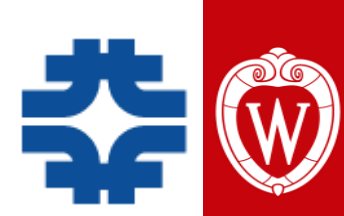
- RF pillbox
- Solenoid
- Collimator
- Dipole



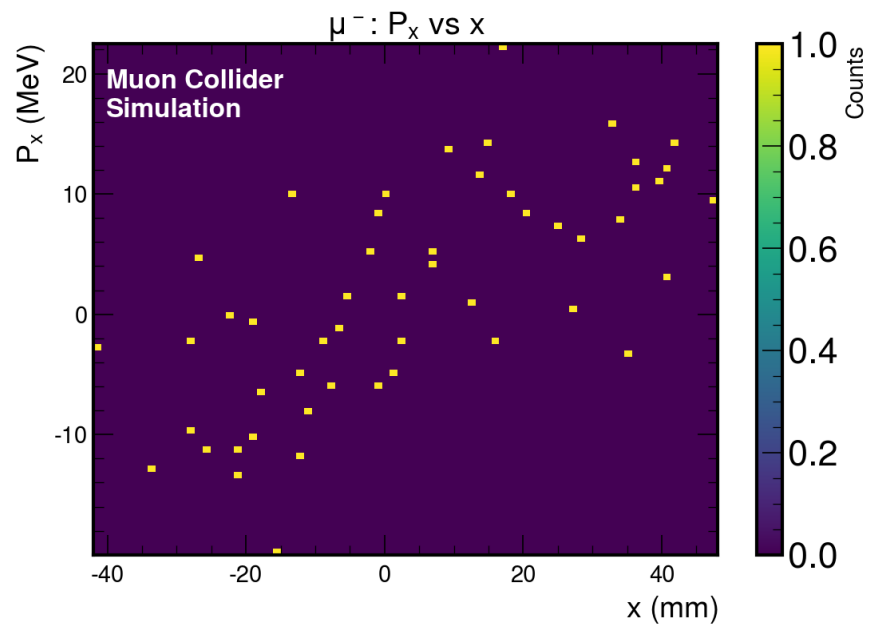
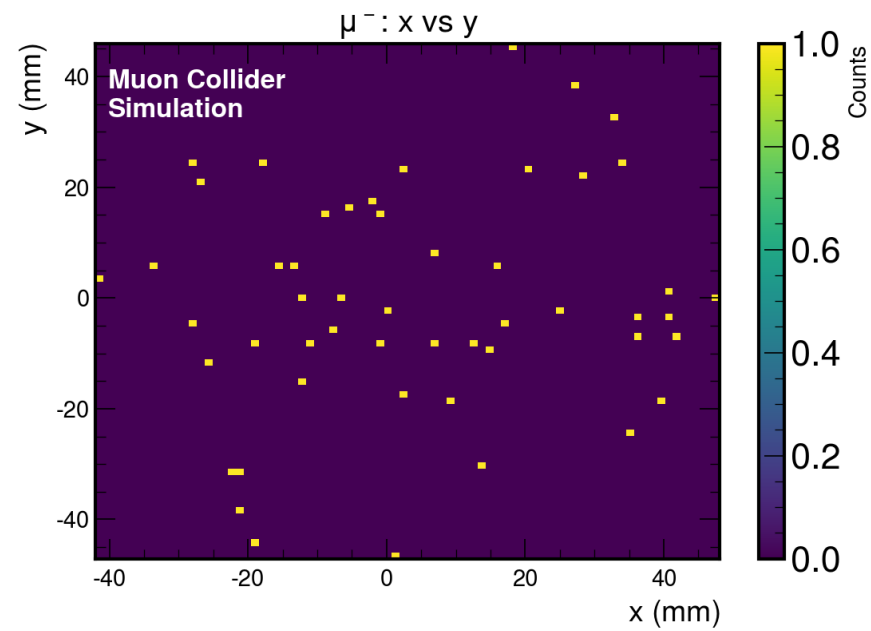
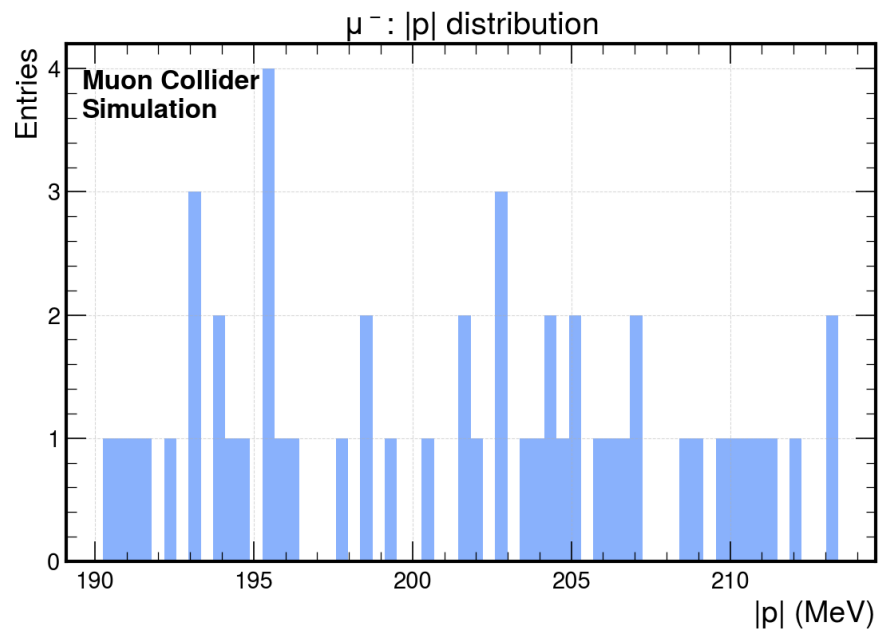
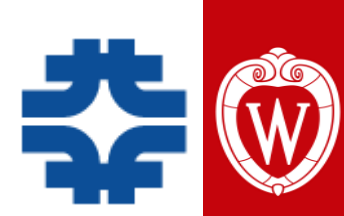
- **collimator (tube)**
 - innerRadius=50
 - outerRadius=500
 - length=10
 - kill=1
- **collimator2 (tube)**
 - innerRadius=50
 - outerRadius=500
 - length=10
 - kill=1
- **solenoid sol1**
 - innerRadius=100
 - outerRadius=150
 - length=100
 - nSheets=10
 - current=21.19
 - kill=1
- **RF (pillbox cavity) pillbox**
 - innerLength=124
 - frequency=0.650
 - maxGradient=15
- **Dipole**
 - angle = -60°
 - Field region:
 - fieldCenterRadius=1000
 - fieldInnerRadius=500
 - fieldOuterRadius=1500
 - fieldHeight=500
 - Iron yoke:
 - ironInnerRadius=100
 - ironOuterRadius=2000
 - ironHeight=1000
 - DipoleField = 0.667742
 - kill=1



Number of Entries: 10020



Number of Entries: 139



Number of Entries: 51

