

DiRC acceptance with the Magnetic Field

John Hardin

Adviser: Mike Williams

MIT PID upgrade group:

Justin Stevens, Baptiste Guegan

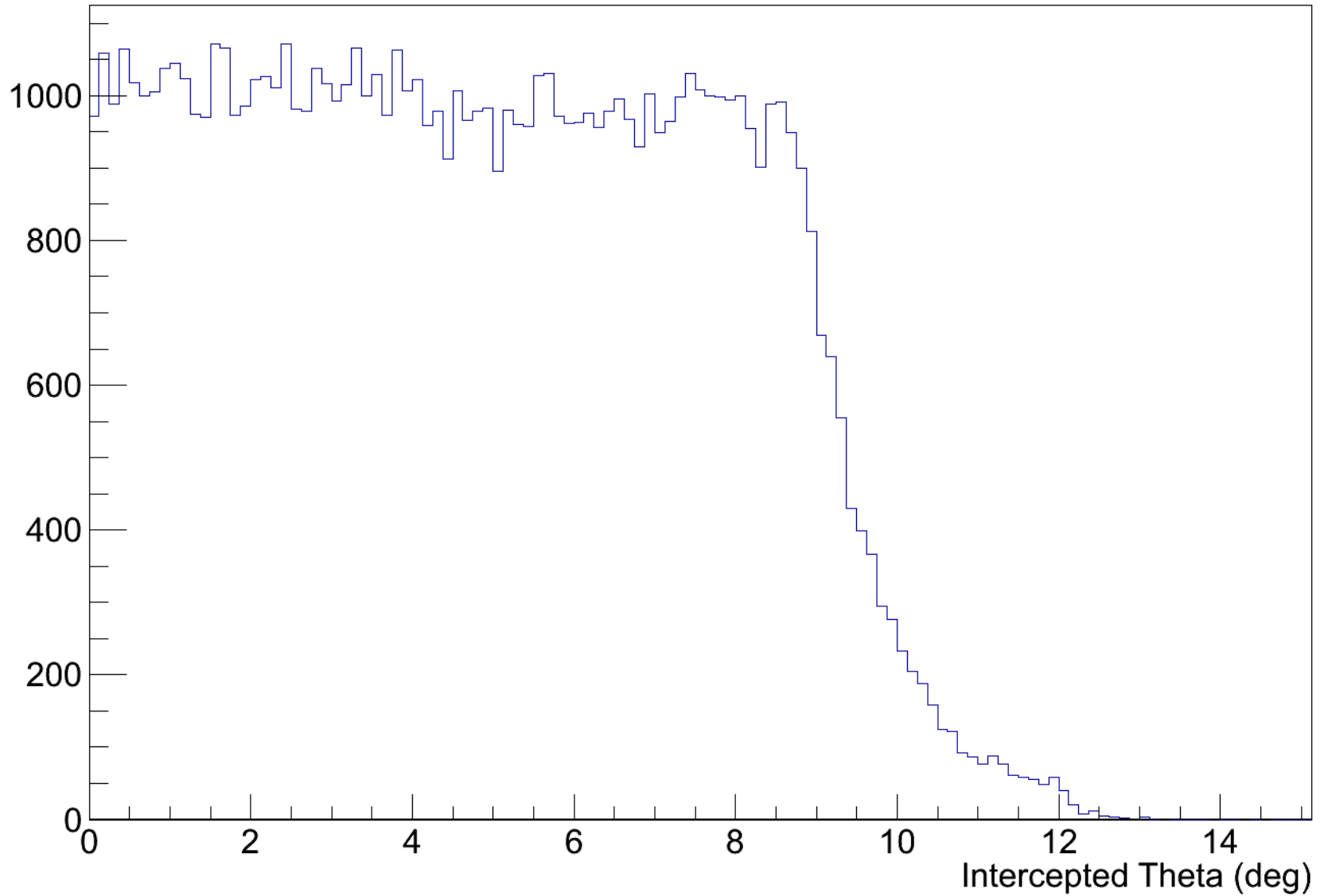
Method

- Throw 100k particles (π^+ , π^- , K^+ , K^-) at angles from 0-14 degrees and 1-7 GeV
- Use particle gun for generation, and geant trajectories for tracking
- Compare their starting angle with the angle of the position at which they intercept various planes

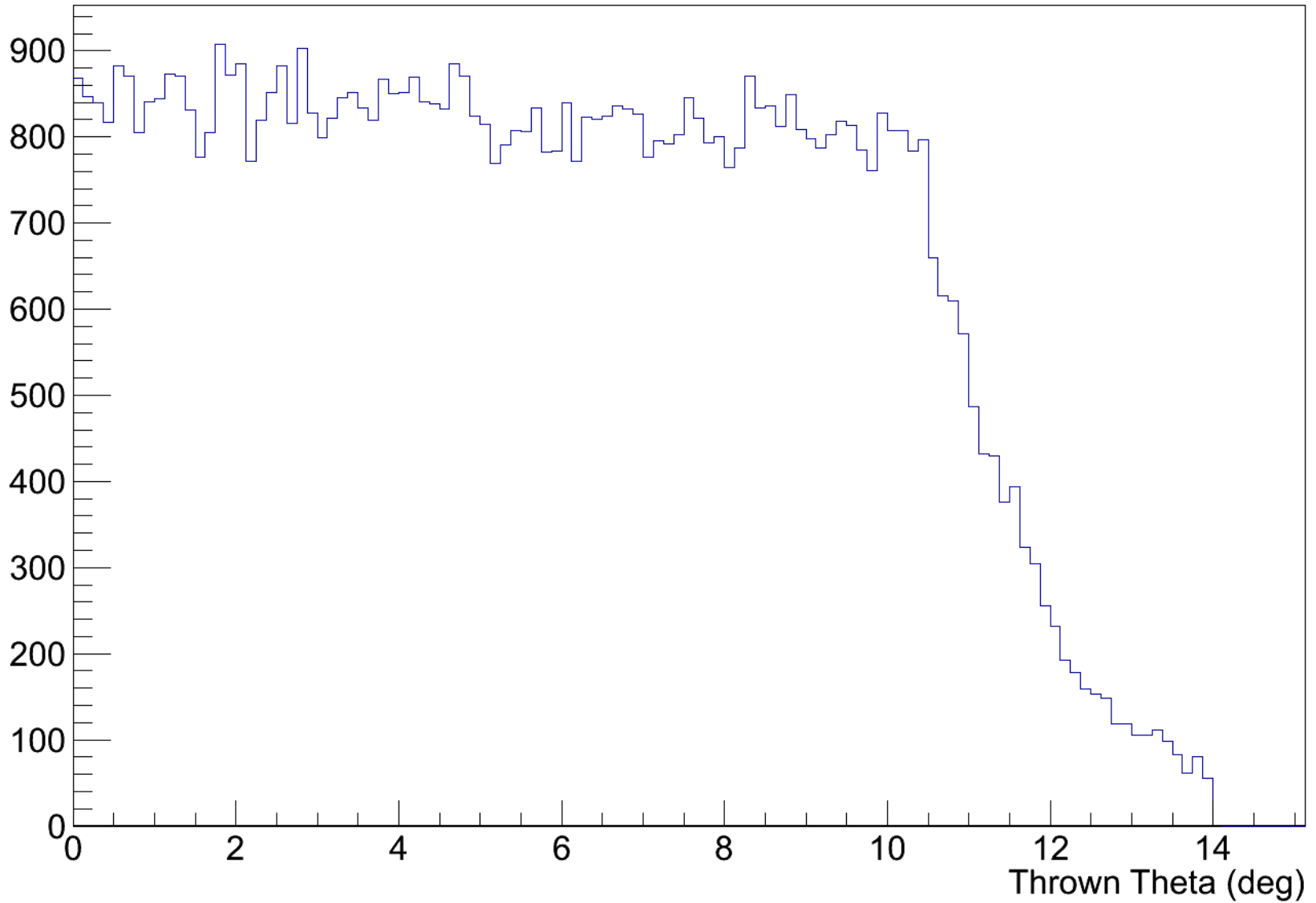
Plots

- Intercept planes at 470cm, 510cm, and 540cm from target
 - Just showing 470cm here; they were all similar so it was picked arbitrarily
- Of the particles that make it to the plane, histogram their initial and final theta
- Plot initial versus final theta
- Plot change in theta versus Momentum

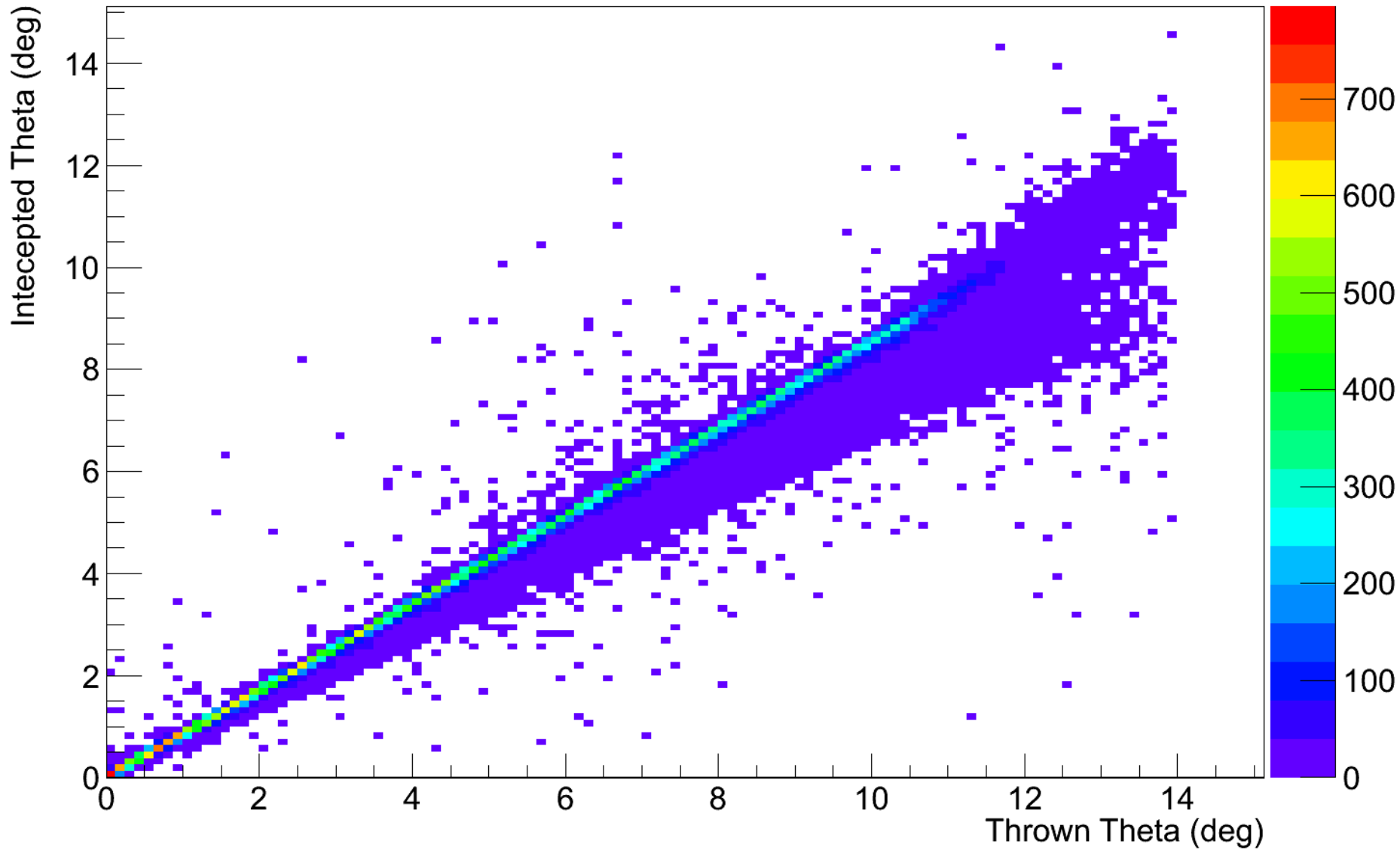
Intercepted Theta at 470 cm



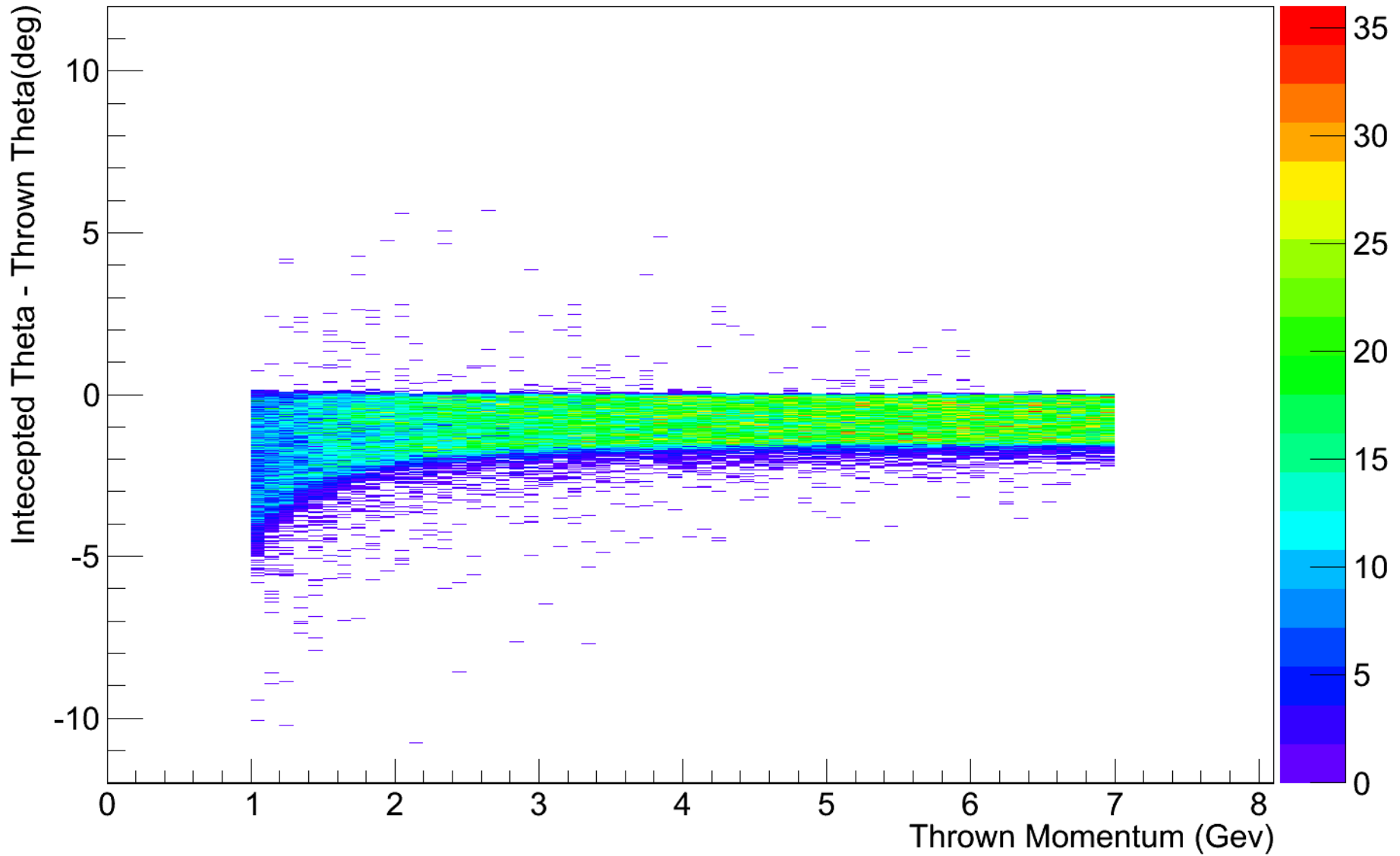
Thrown Theta at 470 cm



Theta versus Thrown Theta at 470



Theta versus Thrown Momentum at 470 cm



Conclusions

- Magnetic Field causes particles to be more forward by the time they reach the DiRC plane
- Lower energies are more affected
- Kaons and Pi⁻ produced very similar plots
 - At low E, fewer Kaons made it to the plane, presumably due to decay in flight
- Plots for 510cm and 540cm were also very similar