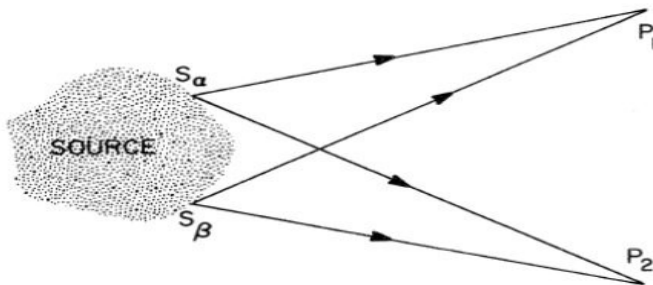


LCP correlations with improved resolution

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16 October 2016

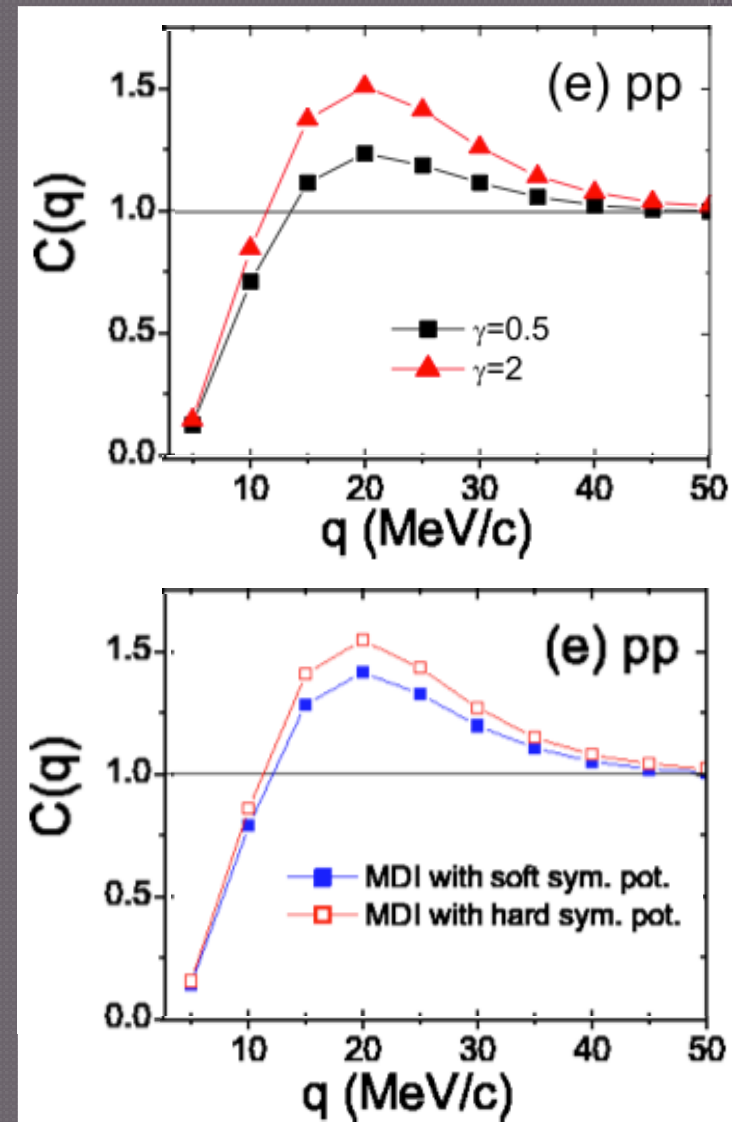
Observable: pp correlation function

- Sensitive to Source Size
 - Lifetime
 - Volume
- Final State Interactions
- Asymmetry term of nEOS



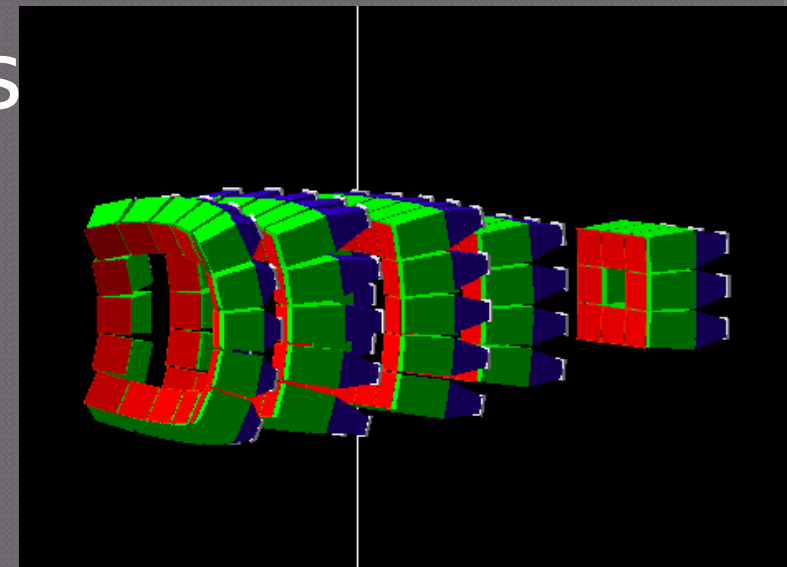
$$|\vec{q}_{Rel}| = \frac{1}{2} |\vec{p}_1 - \vec{p}_2|.$$

$$C(q_{Rel}) = N \frac{Y_c(q_{Rel})}{Y_{nc}(q_{Rel})}$$



Experiment

- Forward Array Using Silicon Technology (FAUST)
- 68 Si-CsI(Tl) Telescopes
- LCP Detection
- ID via dE-E
- Systems: Asymmetry



$^{40}\text{Ar} + ^{70}\text{Zn}$

$A_{\text{TOT}}=110$

$I=0.13$

$^{40}\text{Ca} + ^{58}\text{Ni}$

$Z_{\text{TOT}}=48$

$A_{\text{TOT}}=98$

$I=0.02$

$$I = \frac{N - Z}{A}$$

$^{40}\text{Ar} + ^{58}\text{Fe}$

$Z_{\text{TOT}}=44$

$I=0.10$

$A_{\text{TOT}}=98$

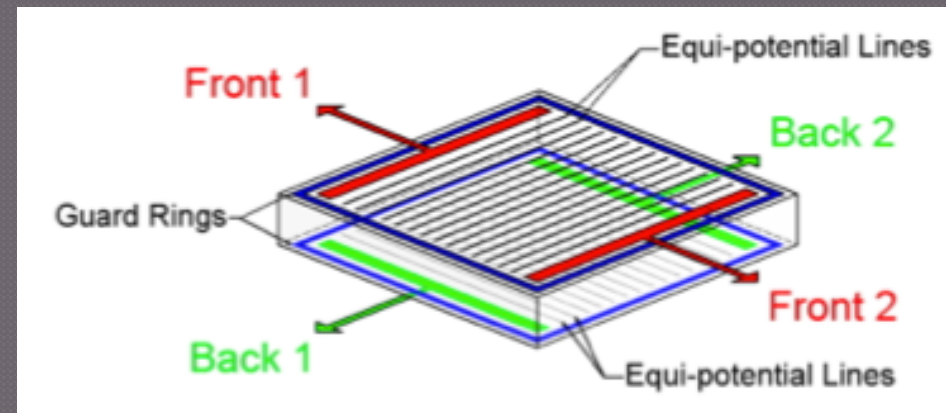
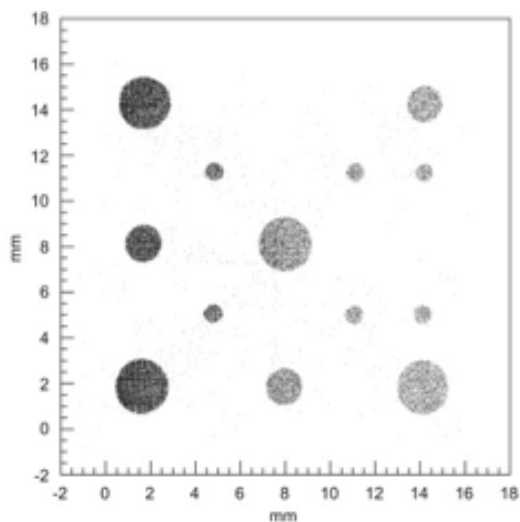
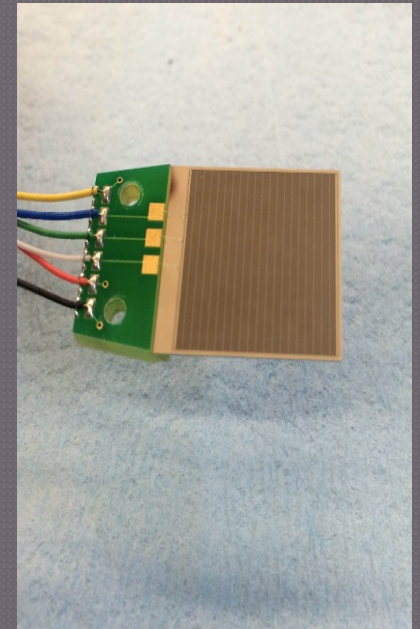
$^{40}\text{Ca} + ^{58}\text{Ni}$

$Z_{\text{TOT}}=48$

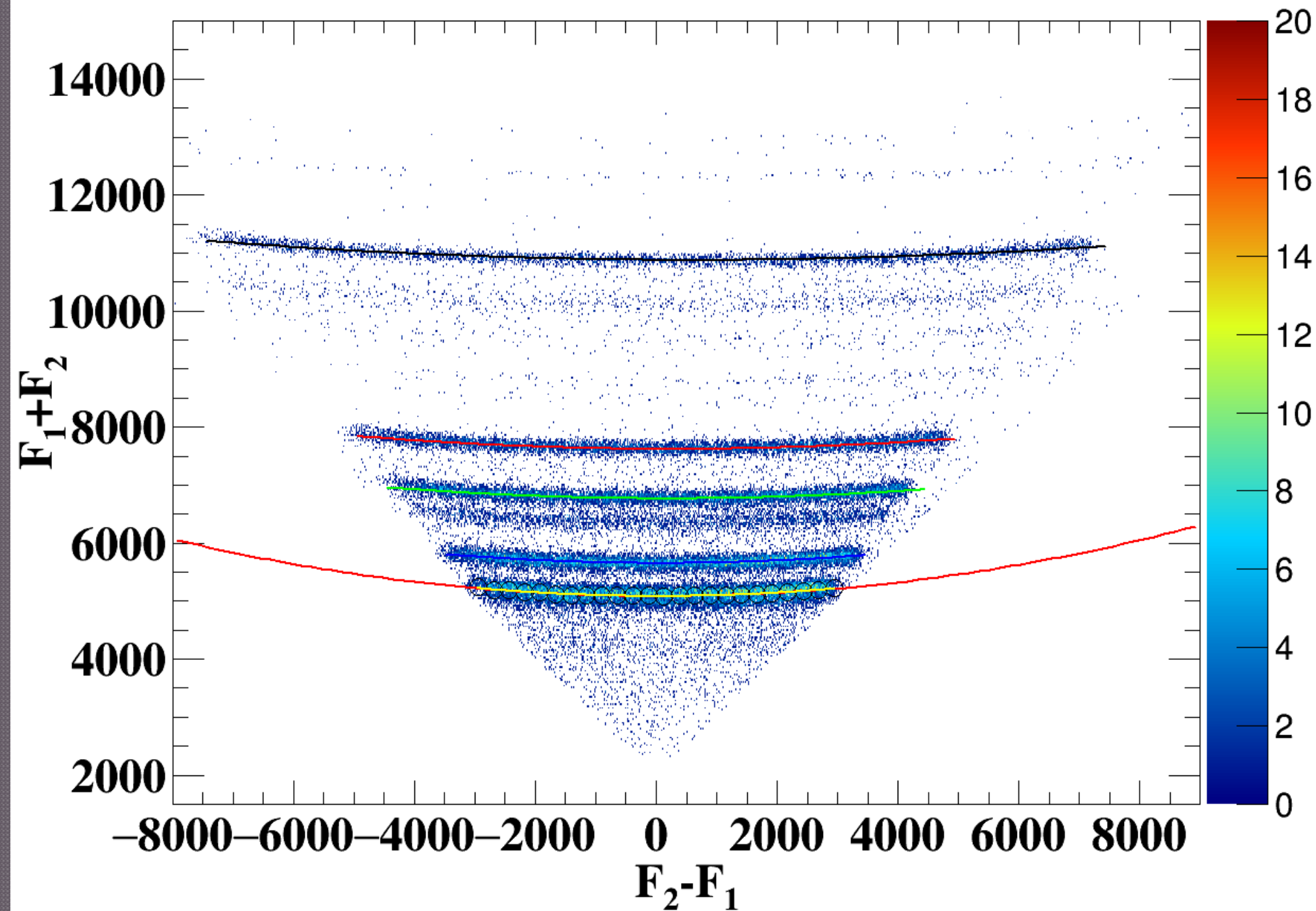
$I=0.02$

Dual-Axis Duolateral Silicons (DADL)

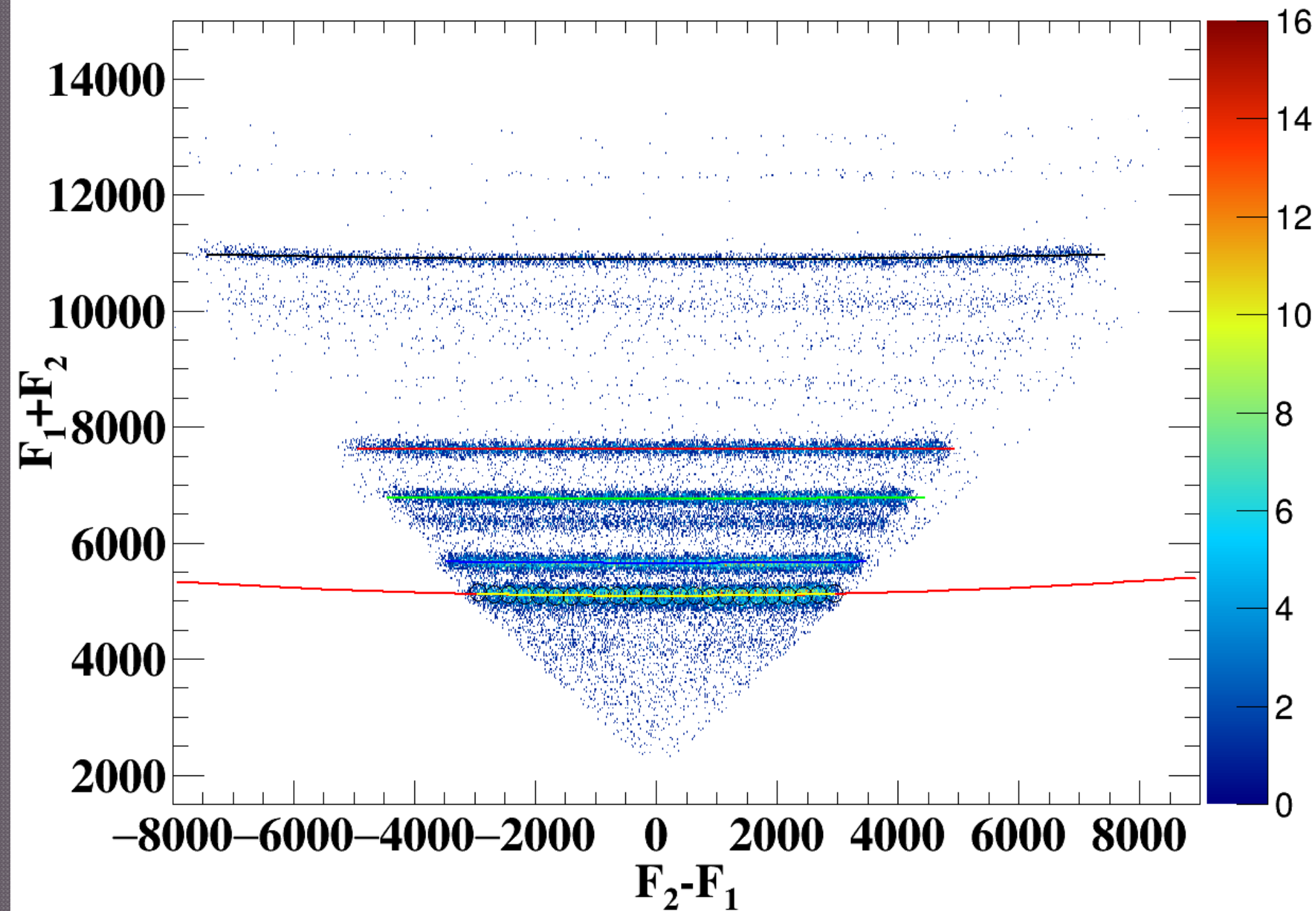
- Angular Resolution
- Uniform resistance
- Equi-potential
- Charge-splitting
- Position resolution $< 200 \mu\text{m}$



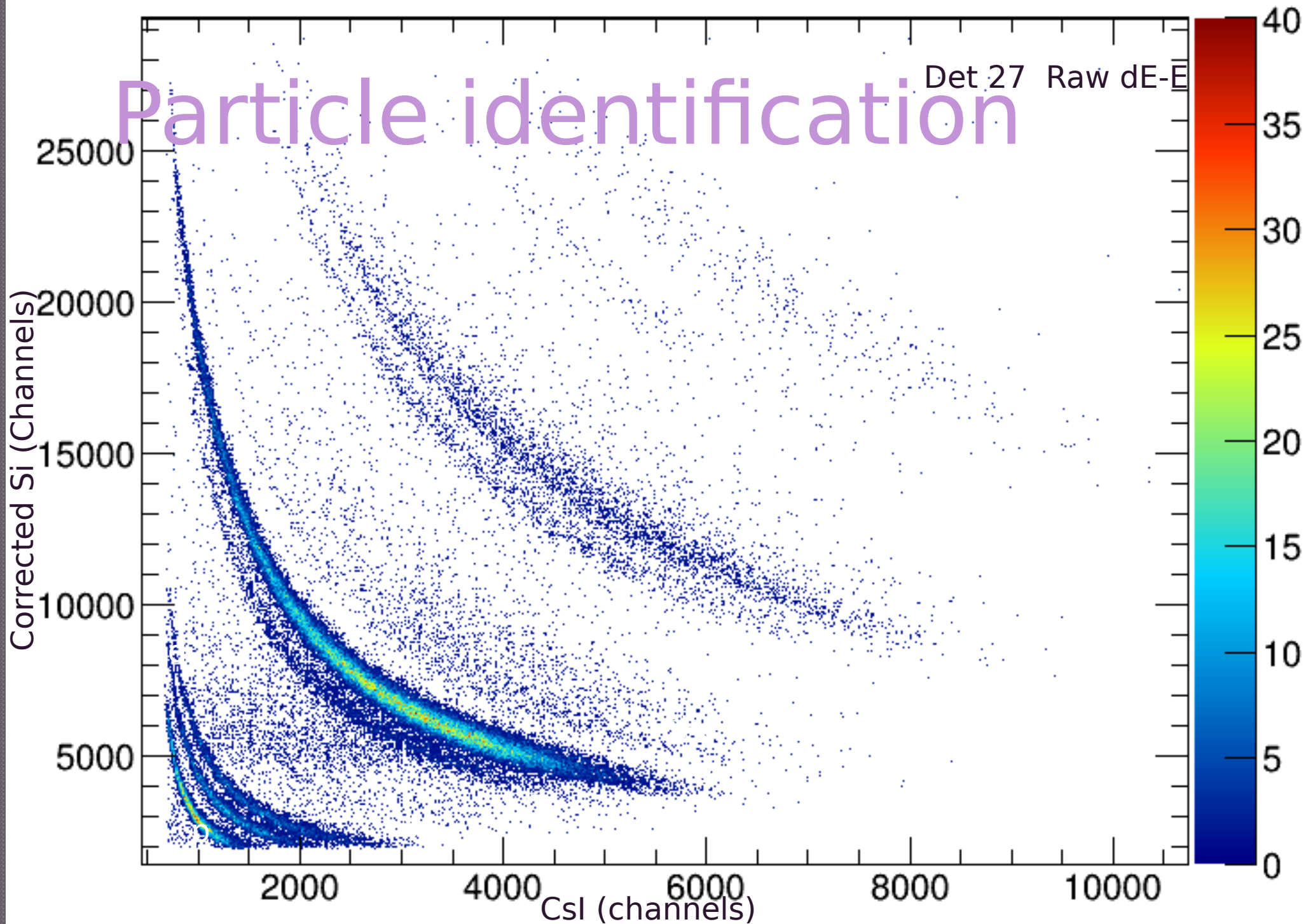
Detector 11, Highest E Alpha from ^{228}Th , Raw



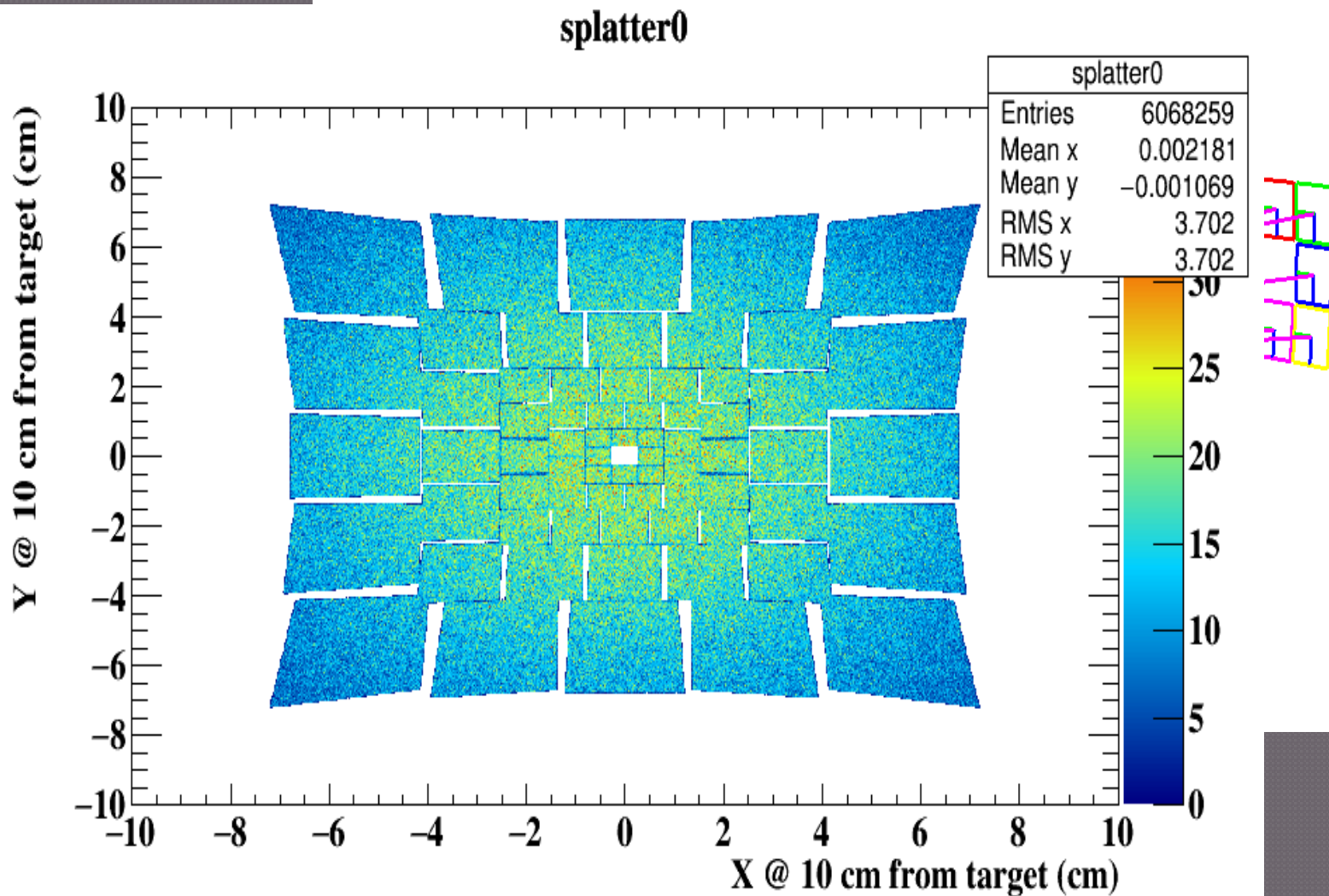
Detector 11, Highest E Alpha from ^{228}Th , Corrected



Particle identification



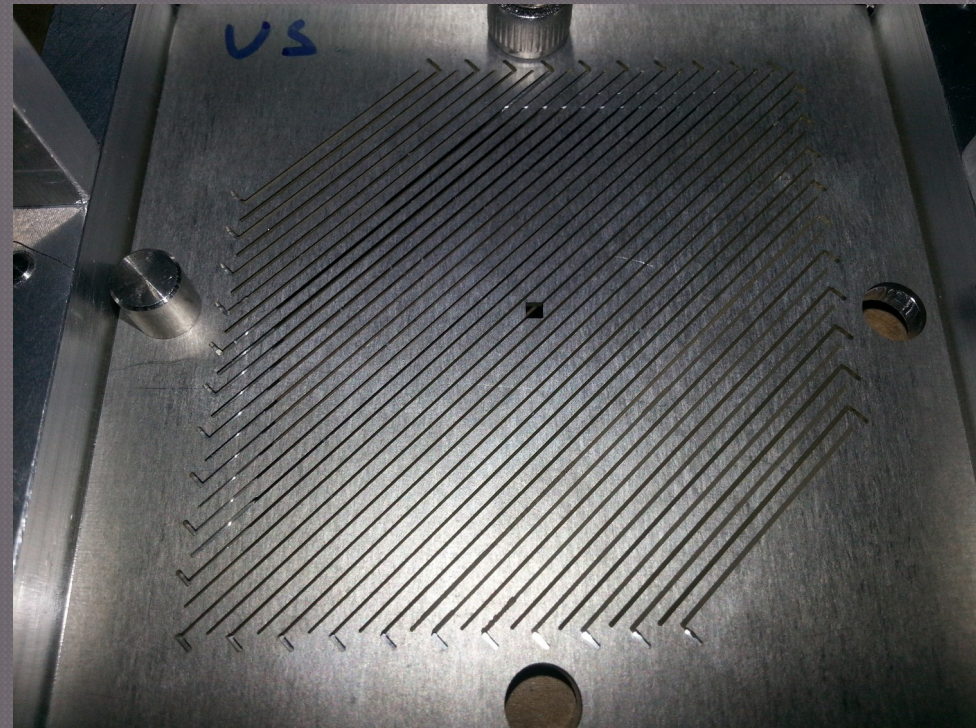
Position Calibration



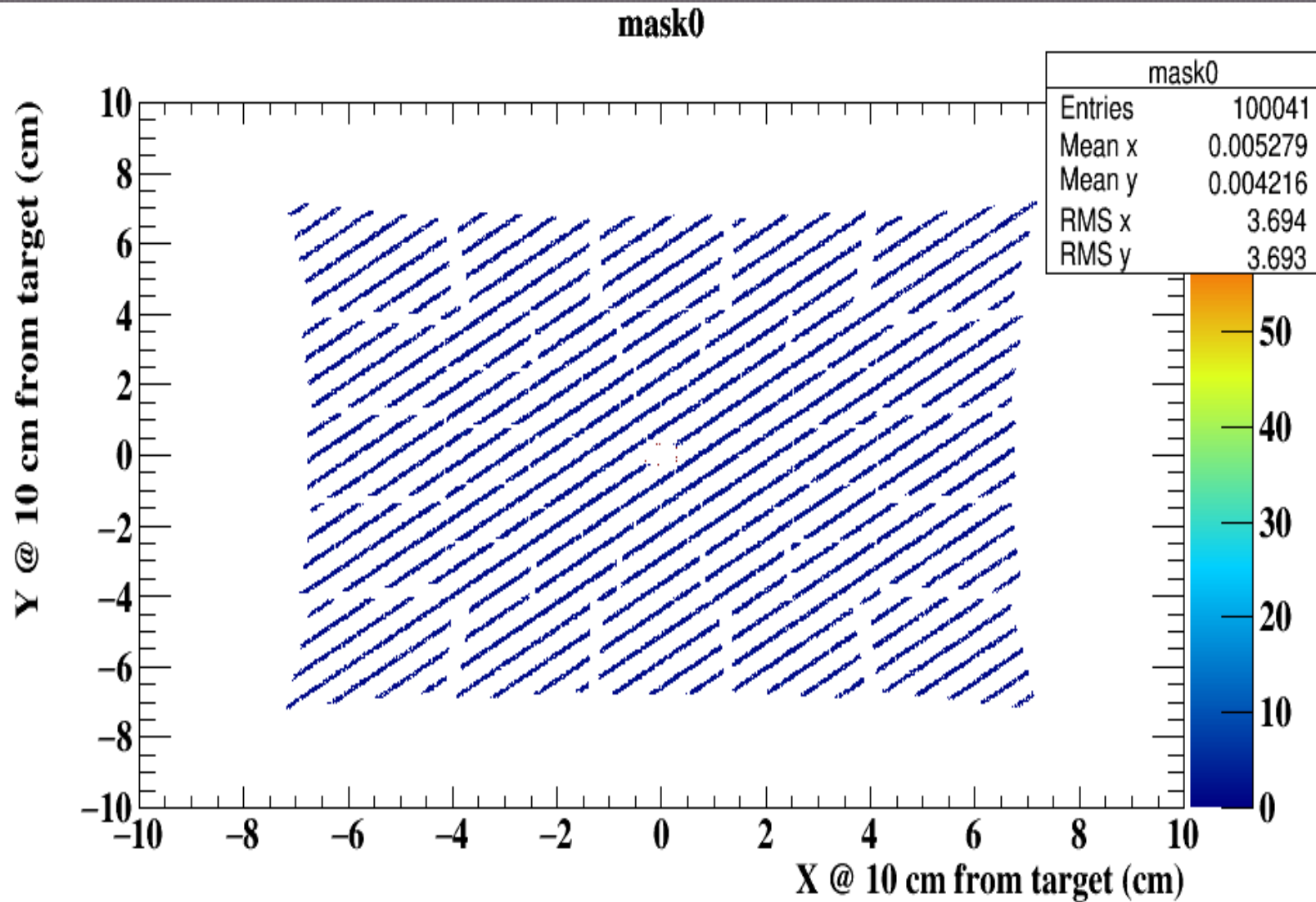
Z-axis (be

Position Calibration: W mask

- Relative Detector Position
- Machined by Wire EDM
 - 40/1000" W
 - Wire EDM $\sim 8/1000$ "
 - Beam Hole
 - Every Stripe Different Angle
- Collimated source or target
- Align Stripes



Position Calibration

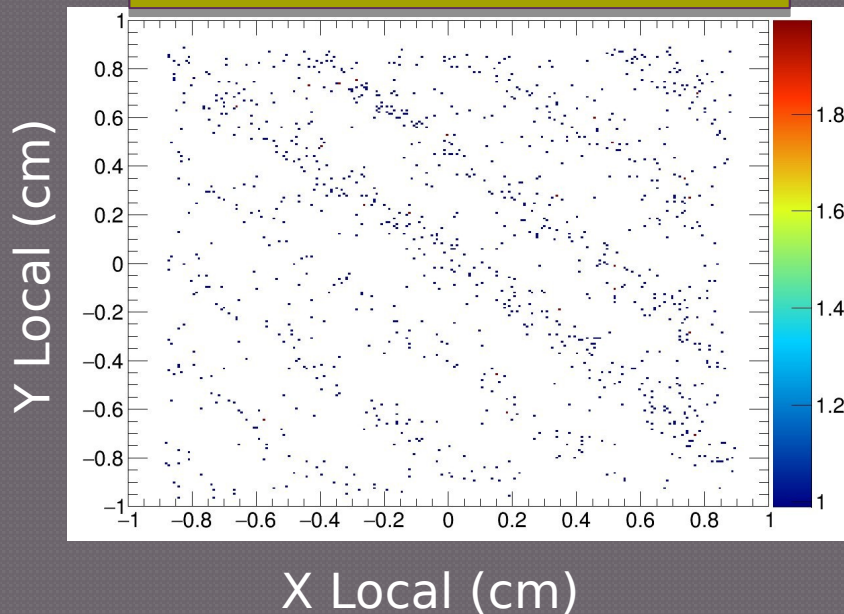


Z-axis (

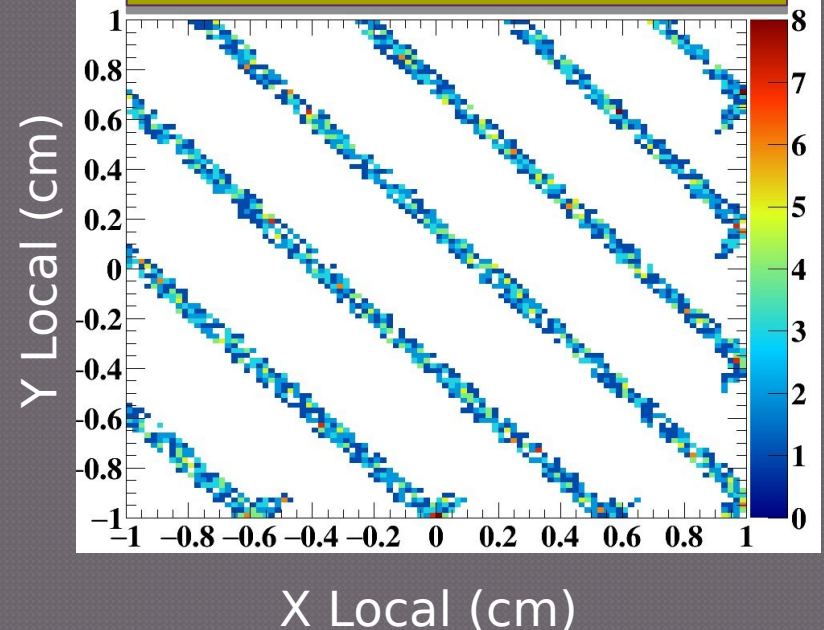
Comparison

- Runs 928-930: Collimated Th Source
 - Cut on ~ 8.6 MeV alpha
 - Same Detector, stripes
- ... as pre

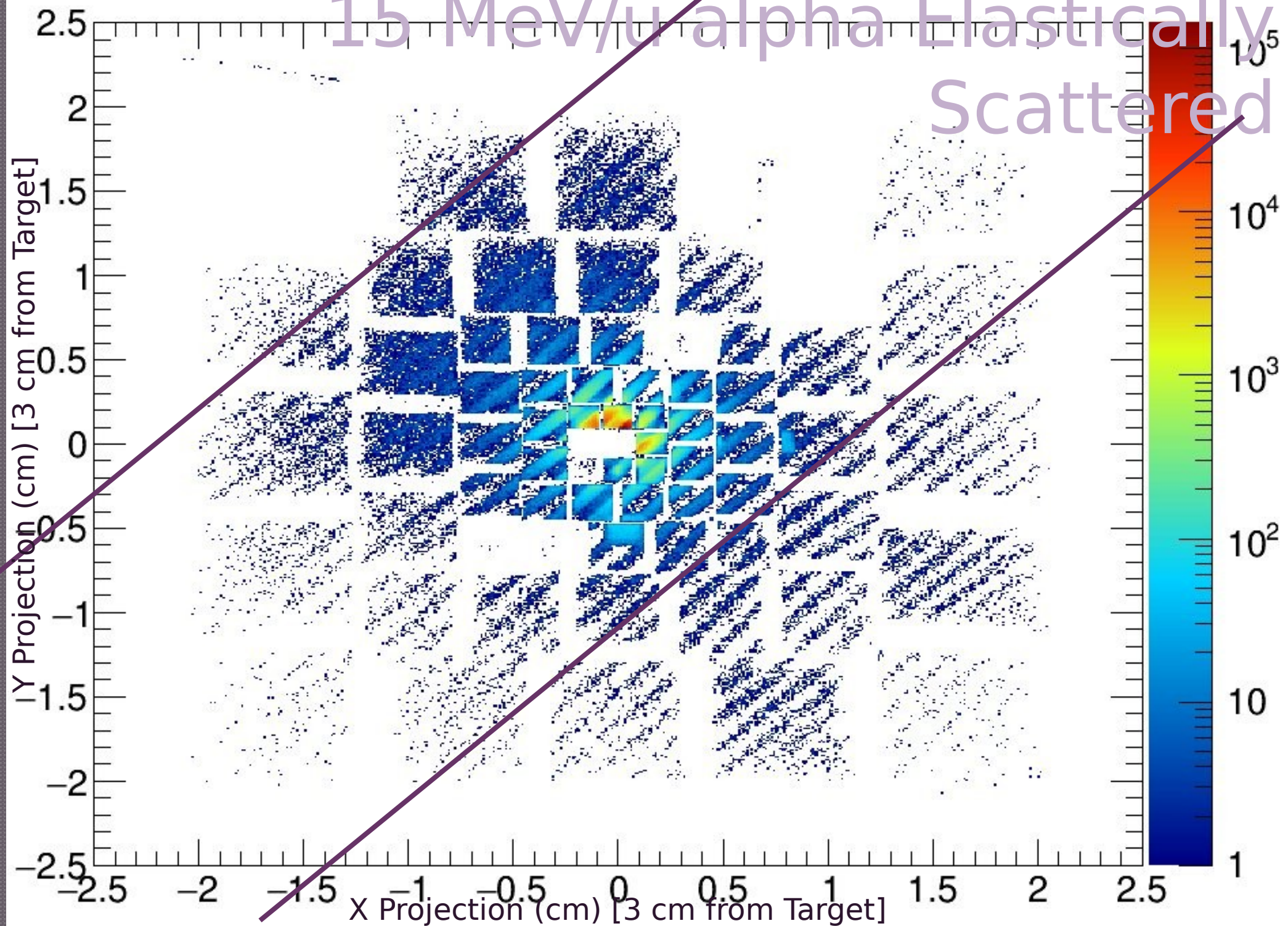
Data: Th Source



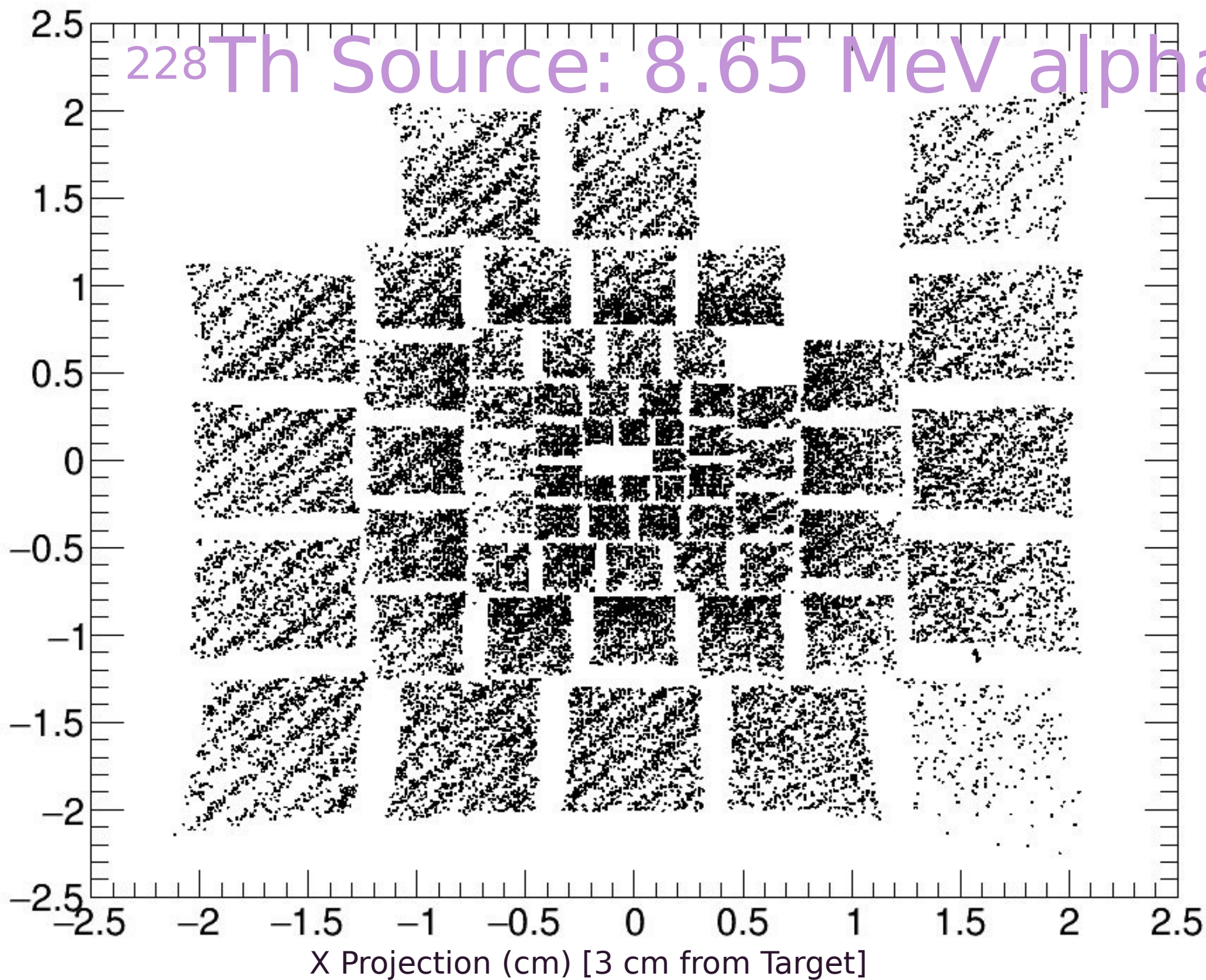
MC Simulation



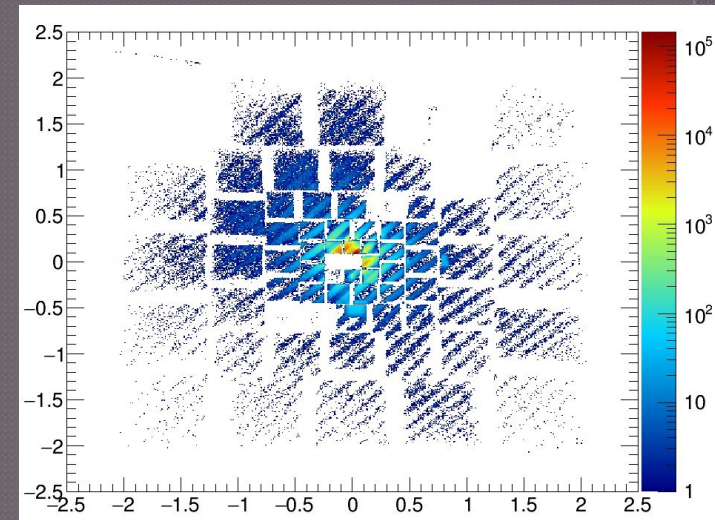
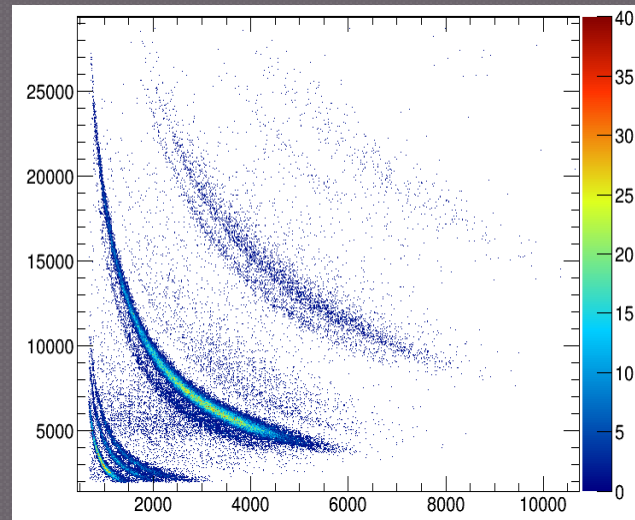
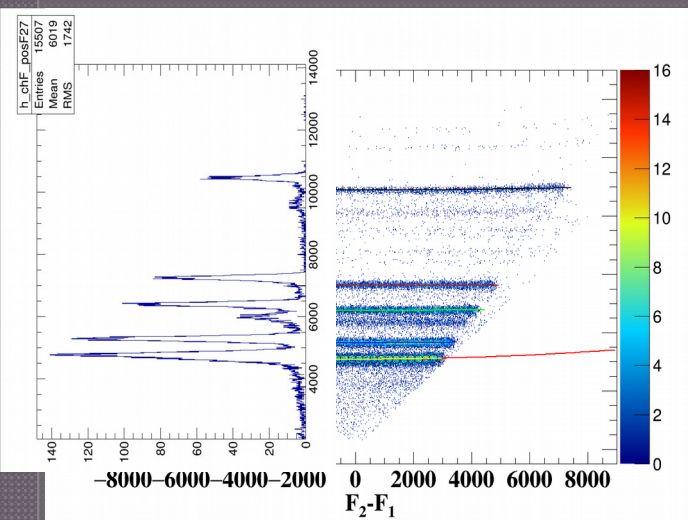
15 MeV/u alpha Elastically Scattered



^{228}Th Source: 8.65 MeV alpha



Status & Future



- ✓ Energy Corrected
- ✓ Particles Identified
- Fine-Tune Position
- Extract Correlation Functions
- Compare to simulations

Acknowledgments

- Cyclotron Institute Staff
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