



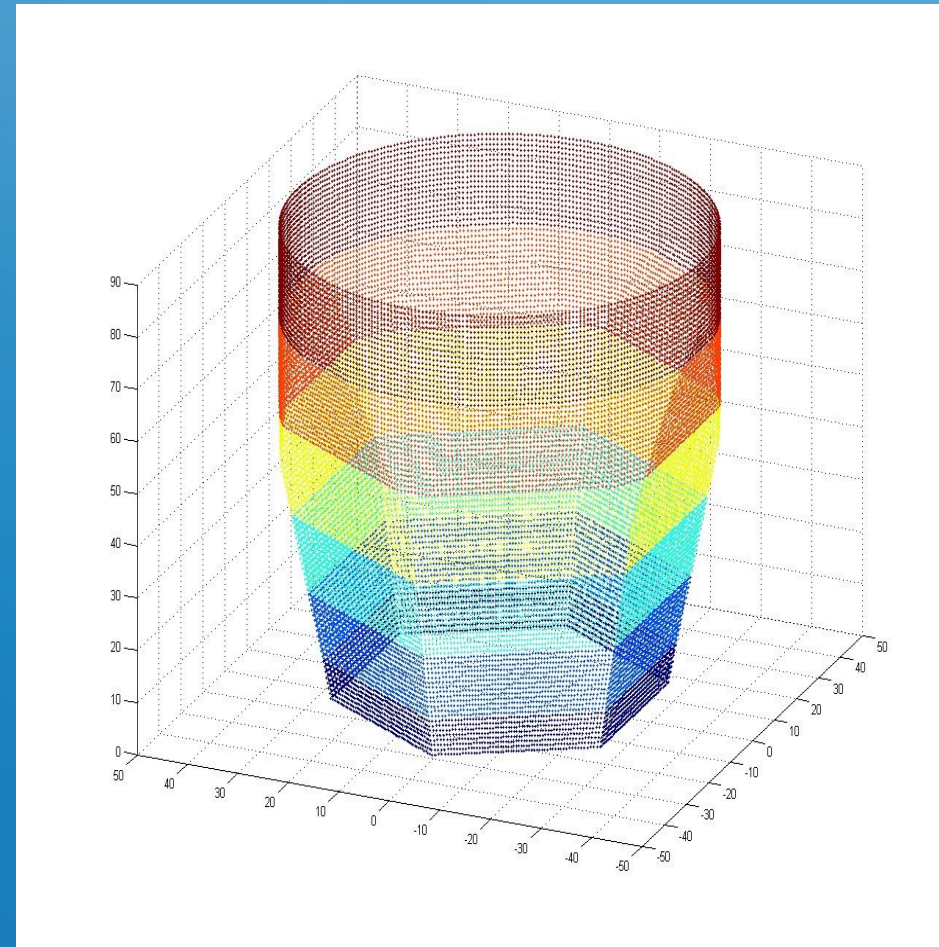
JASS: Improved Signal Basis



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7th AGATA Week, Uppsala
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JASS

- Java Agata Signal Simulation
- Geometry with numerical precision
- Mobility Models taken from: B. Bruyneel, P. Reiter, G. Paskovici, Nucl. Instr. and Meth. A, 569, pp. 764-773, 2006
- Potentials calculated on 0.5 mm grid
- Signal calculation via Shockley-Ramo Theorem: W. Shockley, J. Appl. Phys. 9(10), pp. 635-636, 1938 S. Ramo, Currents Induced by Electron Motion, Proc. IRE 27, p. 584, 1939

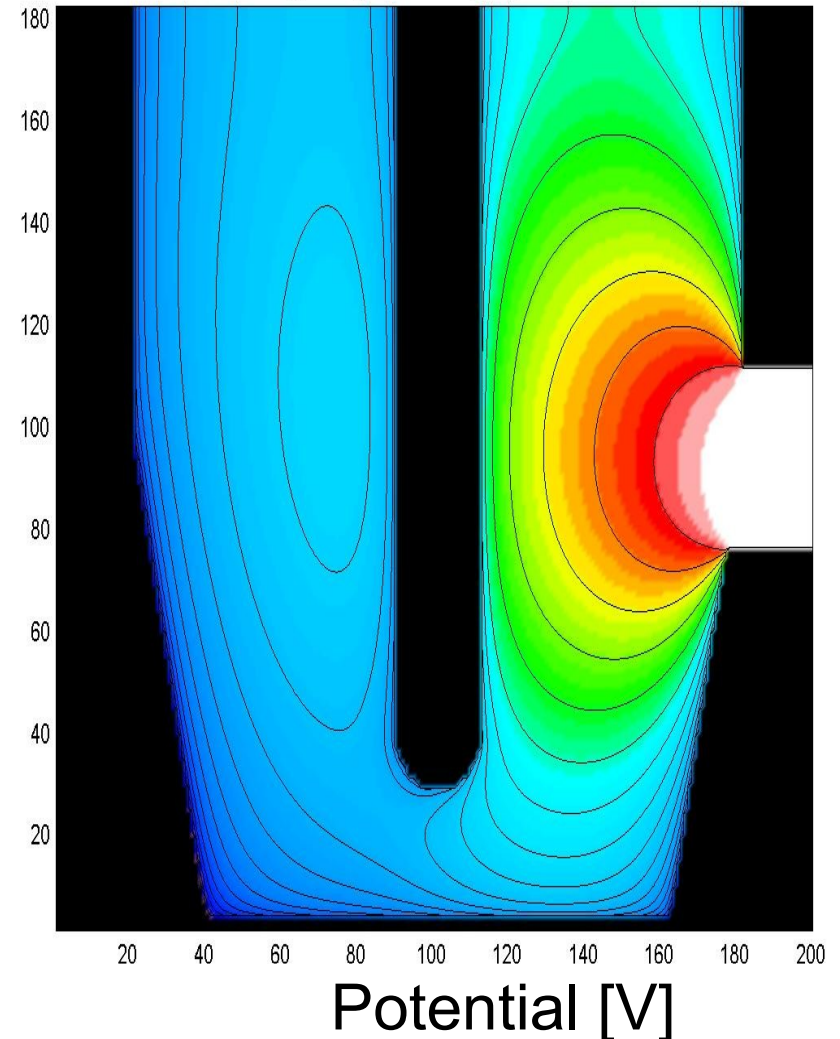


Interpolation

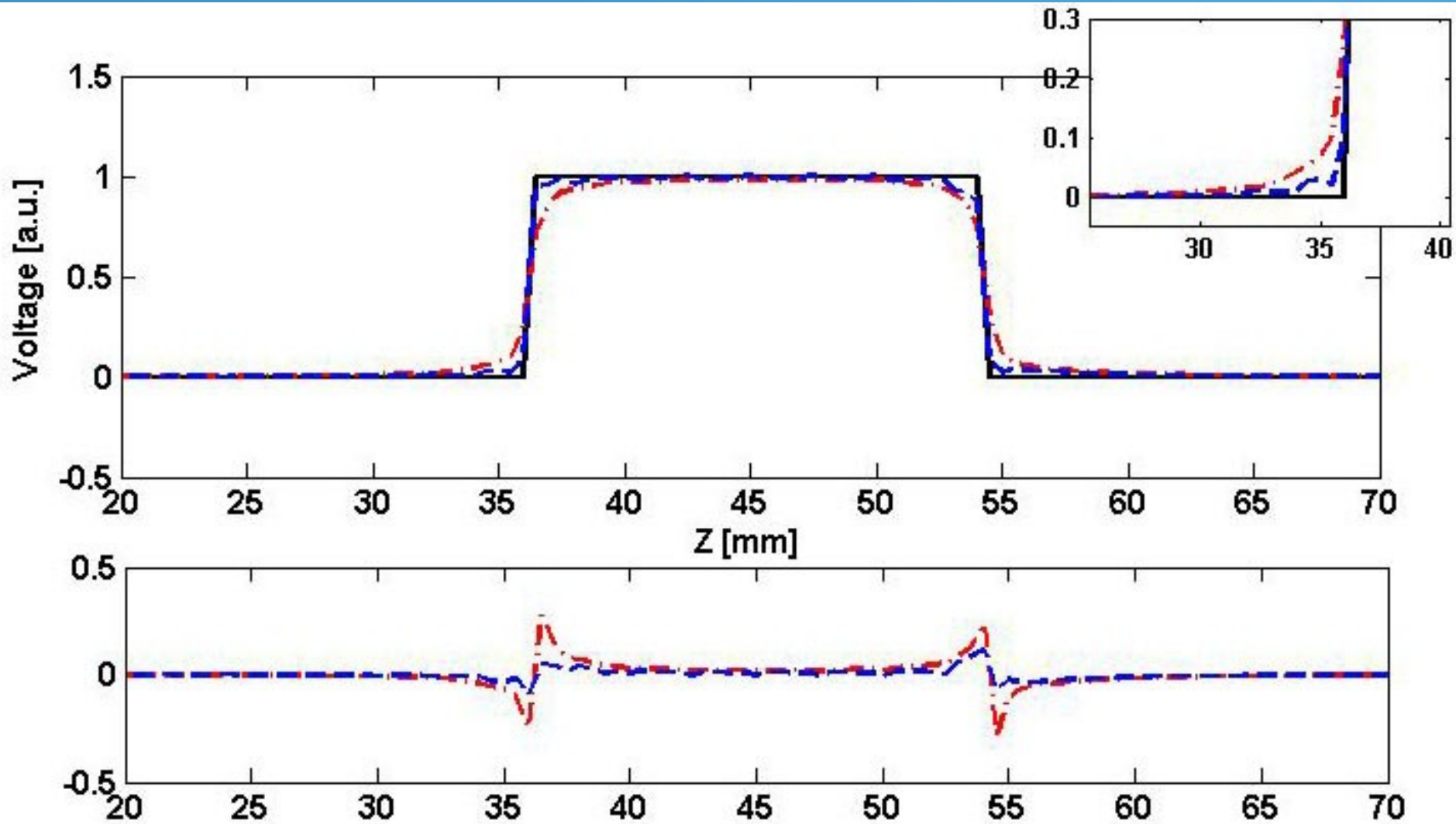
- Kernel-Interpolation
- $\phi(\vec{x}) = \sum f(\vec{x}, \vec{x}_i) * \phi(\vec{x}_i)$
 - Gauß-Funktion
 - FWHM= 0,5 mm
 - Default: 2. Order
- Discontinuities at segment boundaries
- Closed Geometry

$$\sum \phi_i(\vec{r}) = 1$$
$$\sum Q_i(t) = 0$$

Weighting Potential, Segment A4

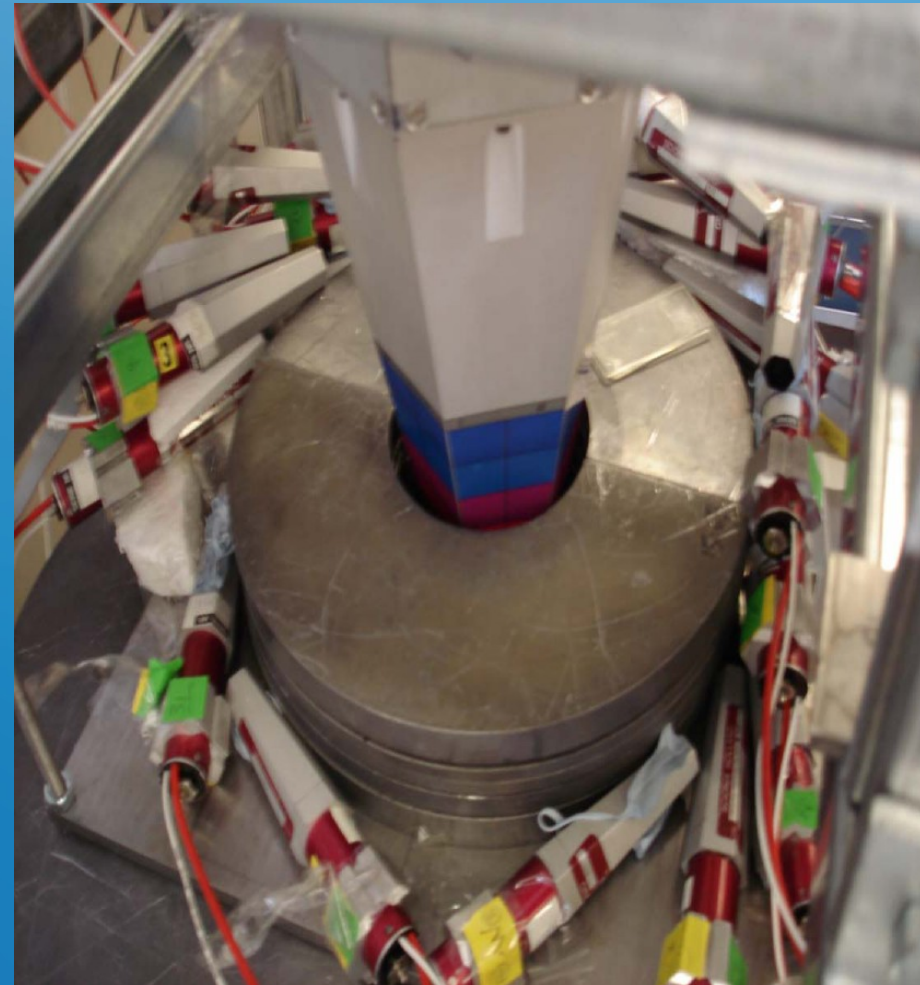


Performance of Interpolation Routine

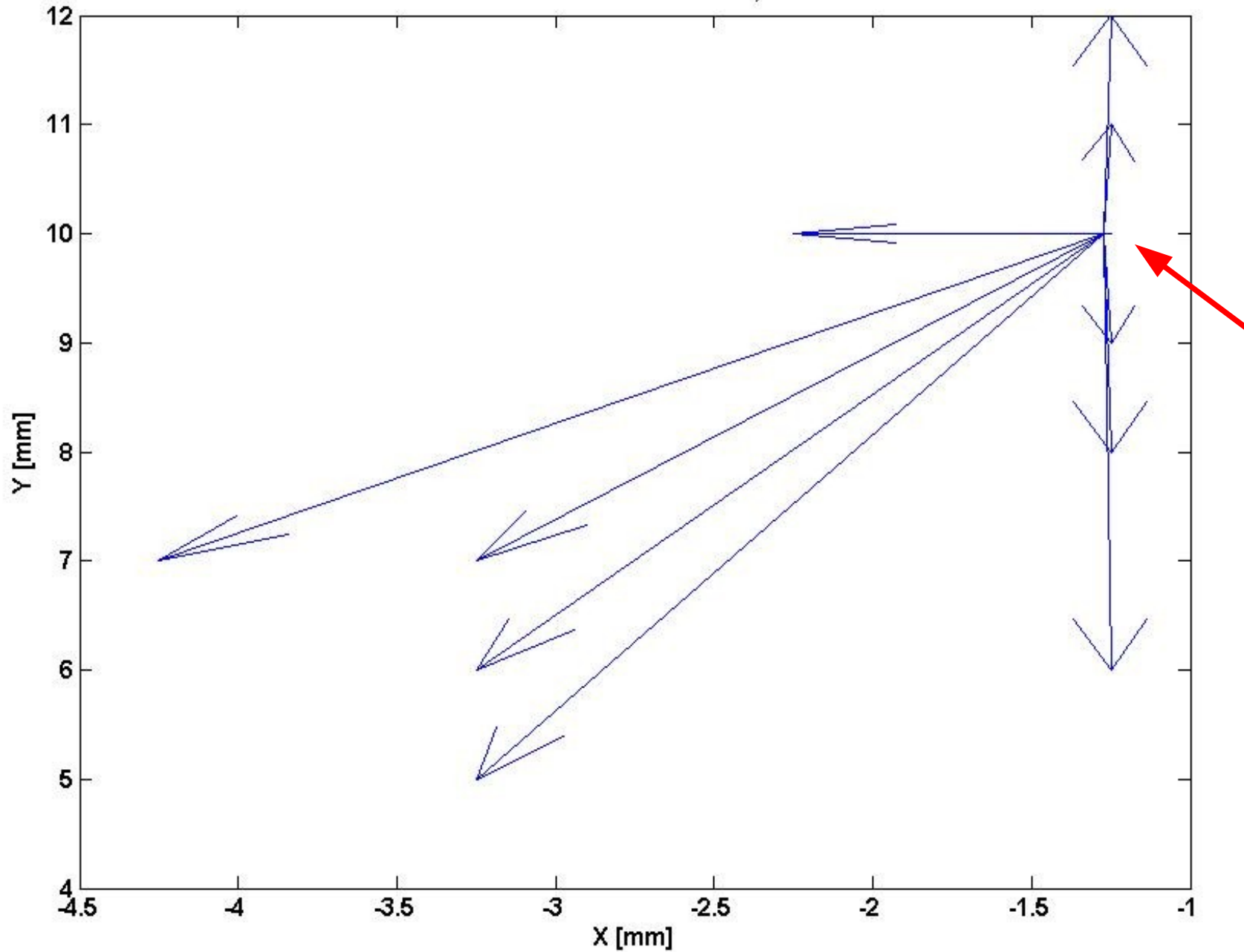


Scanning Data

- Coincidence Scan Data
 - Faster Scanning Method proposed
- Several events at same location
 - Reduces noise => scale transient
 - ~ 2mm FWHM coaxial part for each coordinate
- Event by Event Analysis
 - No Scaling

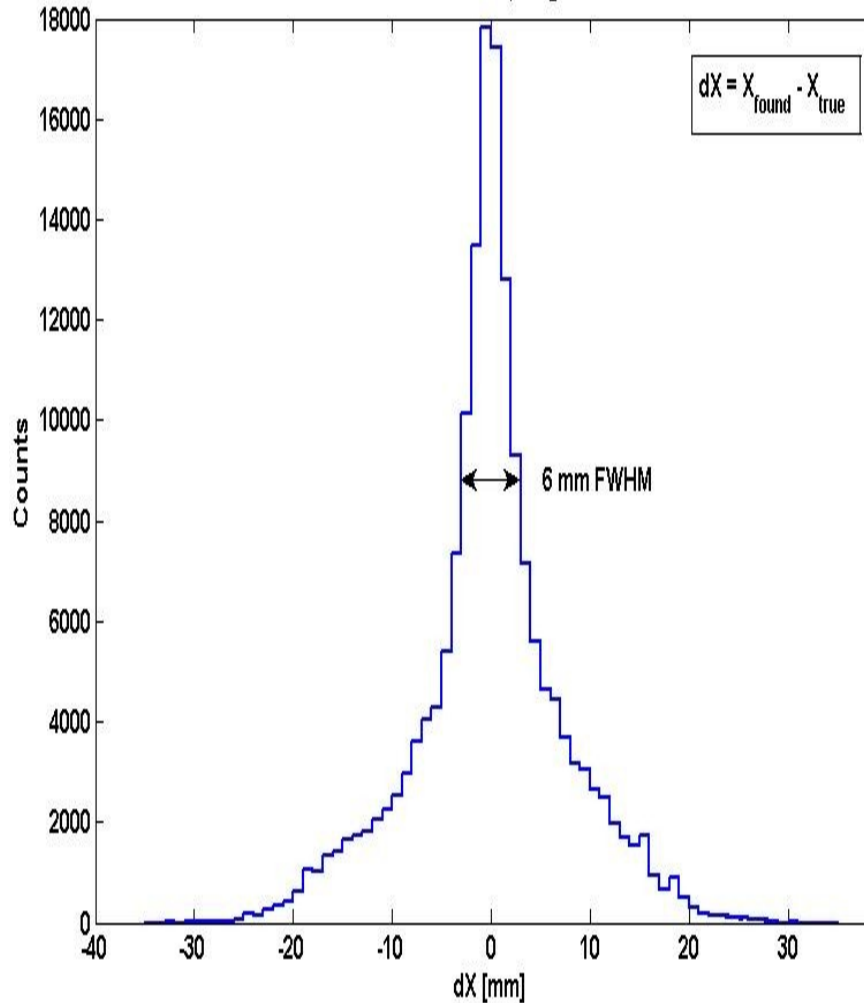


Point with smallest mean error, ~1.2 mm

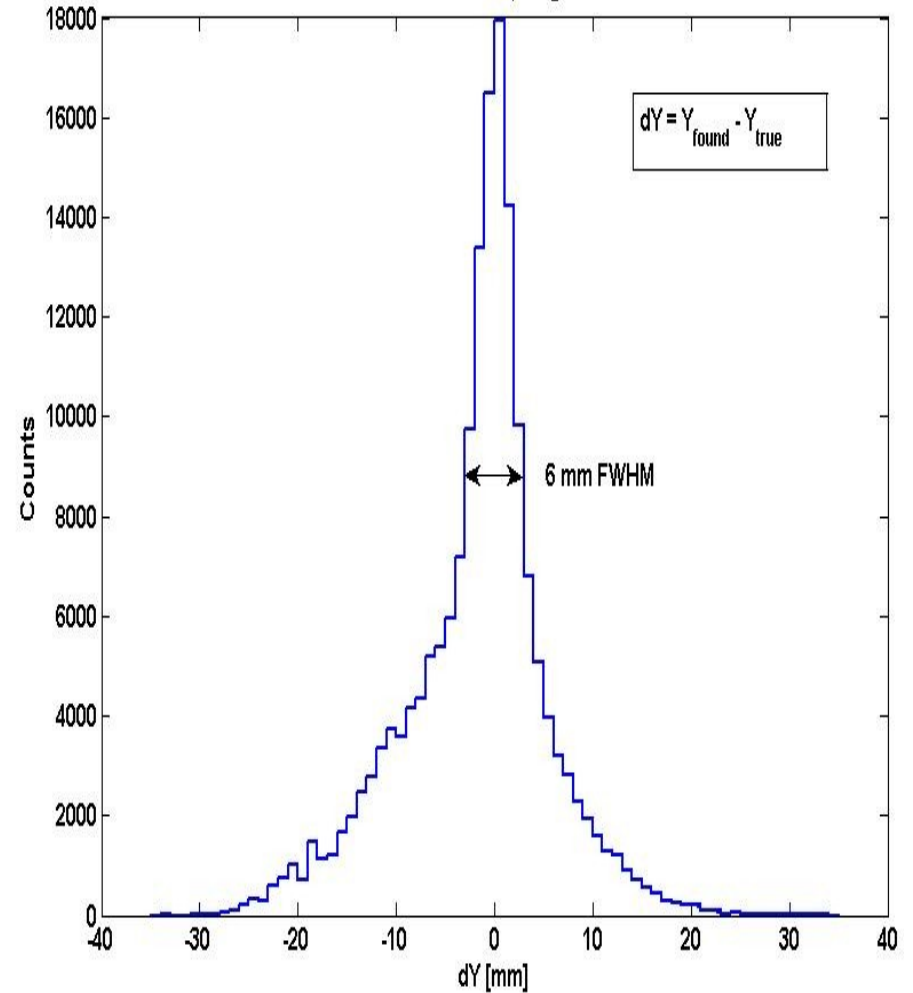


Errors on X and Y

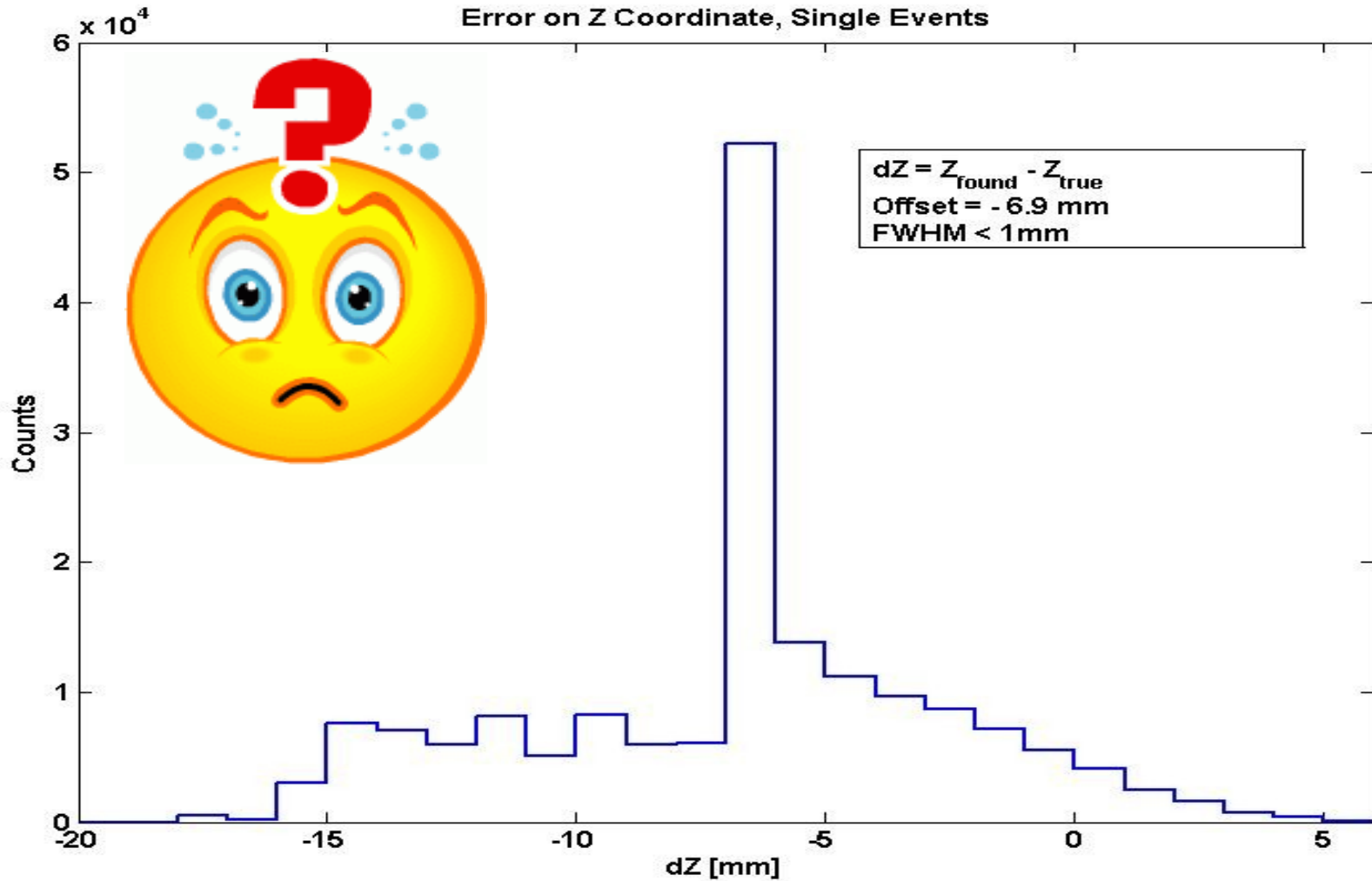
Error on X Position, Single Events



Error on Y Position, Single Events



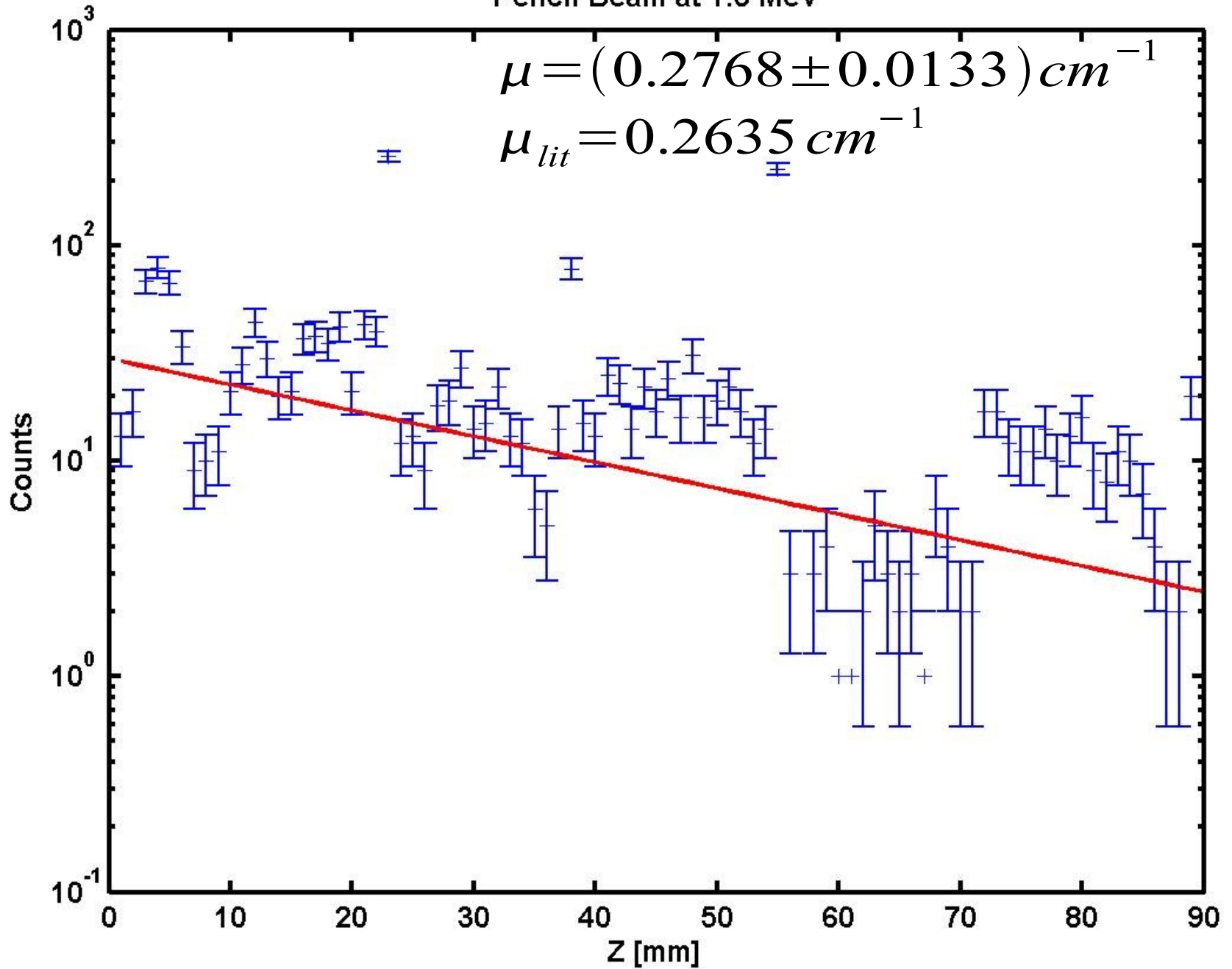
Error on Z



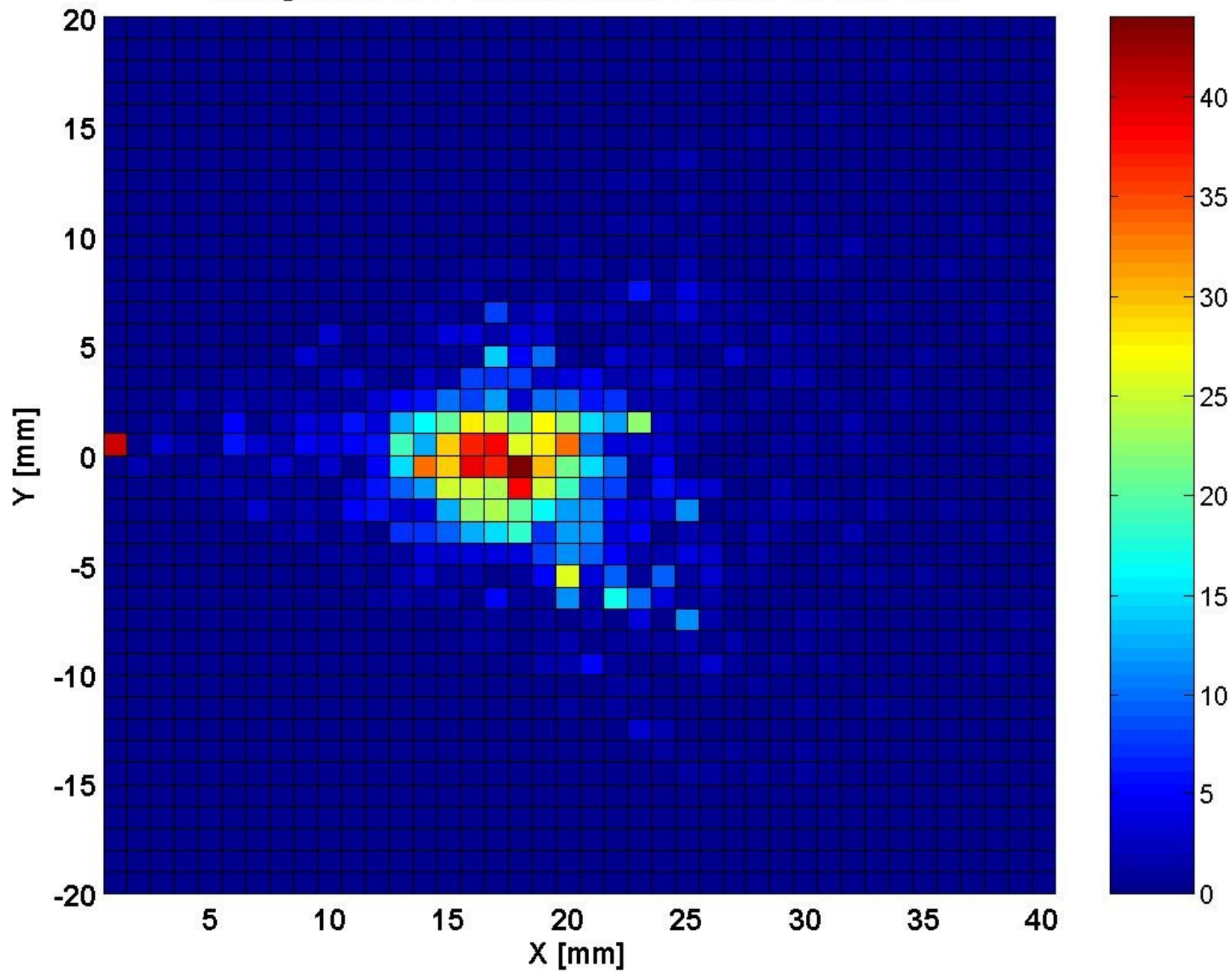
Pencil Beam at 1.3 MeV

- Collimated Source in front of detector
- Event Selection:
 - $1.32 \text{ MeV} < E < 1.34 \text{ MeV}$
 - Single Segment hits only
- PSA should reproduce exponential decay
 - Only searching for single hits per segment
 - Transients scaled by 1000

Pencil Beam at 1.3 MeV



Histogram of X-Y-Positions after PSA on 1.3 MeV line



Summary

- Improved Interpolation Routine
- Event By Event
 - X and Y Resolutions are o.k.
 - Z Resolution is puzzling
 - Possible Causes?
- Pencil Beam Data
 - Exponential Decay is reproduced
 - Spread in XY \sim 4mm