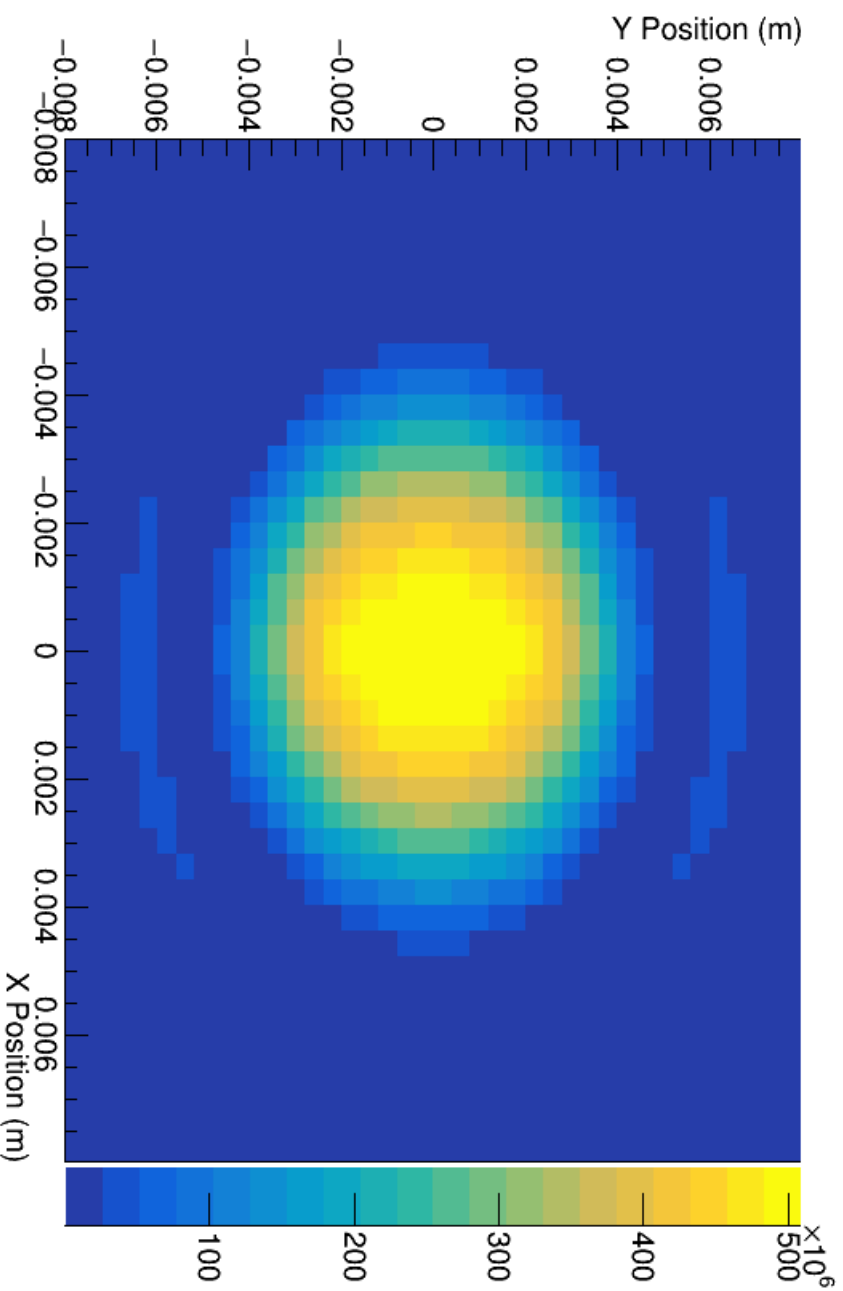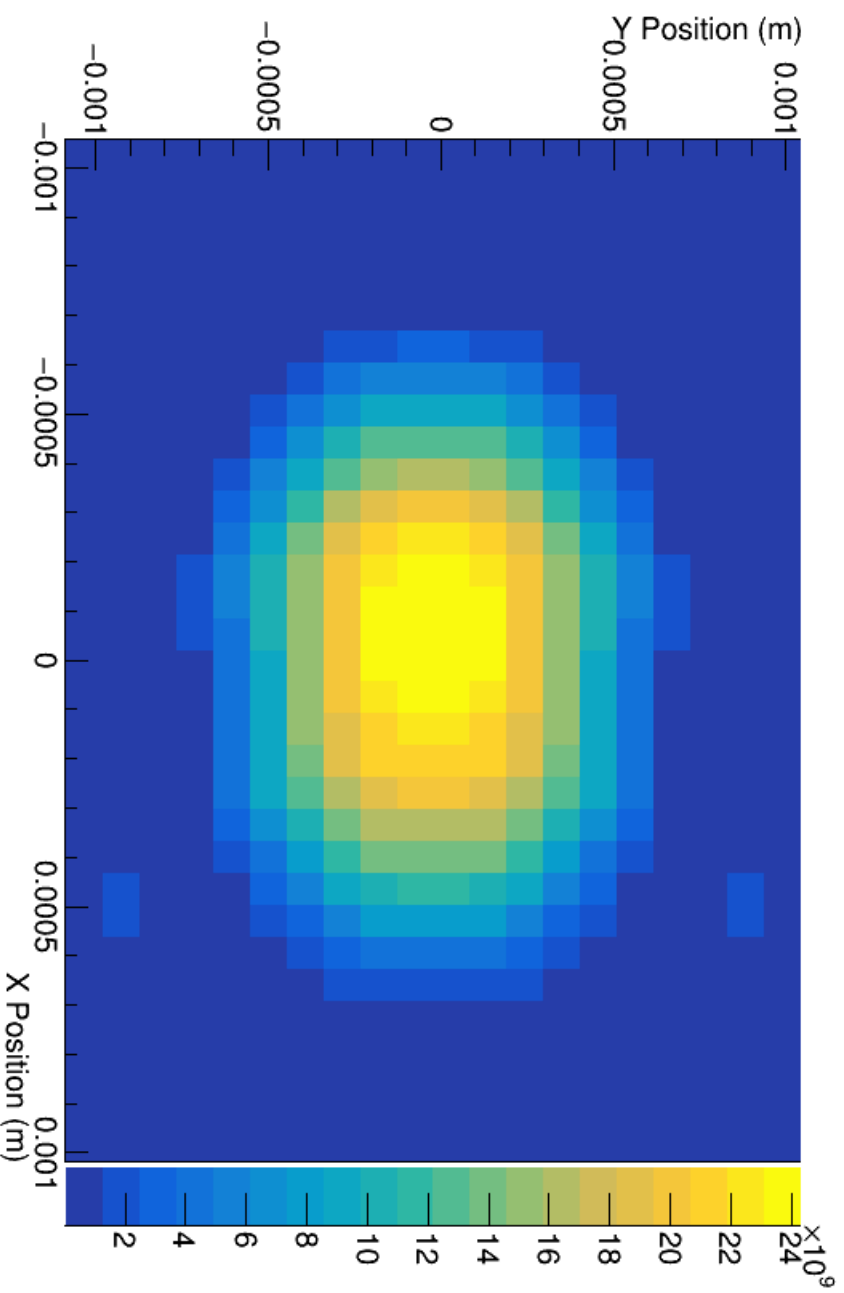# OSC Updates

- Included effects of focusing

- Properly accounted for different frequencies

- Current amounting to one electron per radiation wavelength – will correct this with a fudge factor

Radiation Intensity at Lens
(6m from 1st Undulator Center)

Radiation Intensity at 2nd Undulator (6m from Lens)
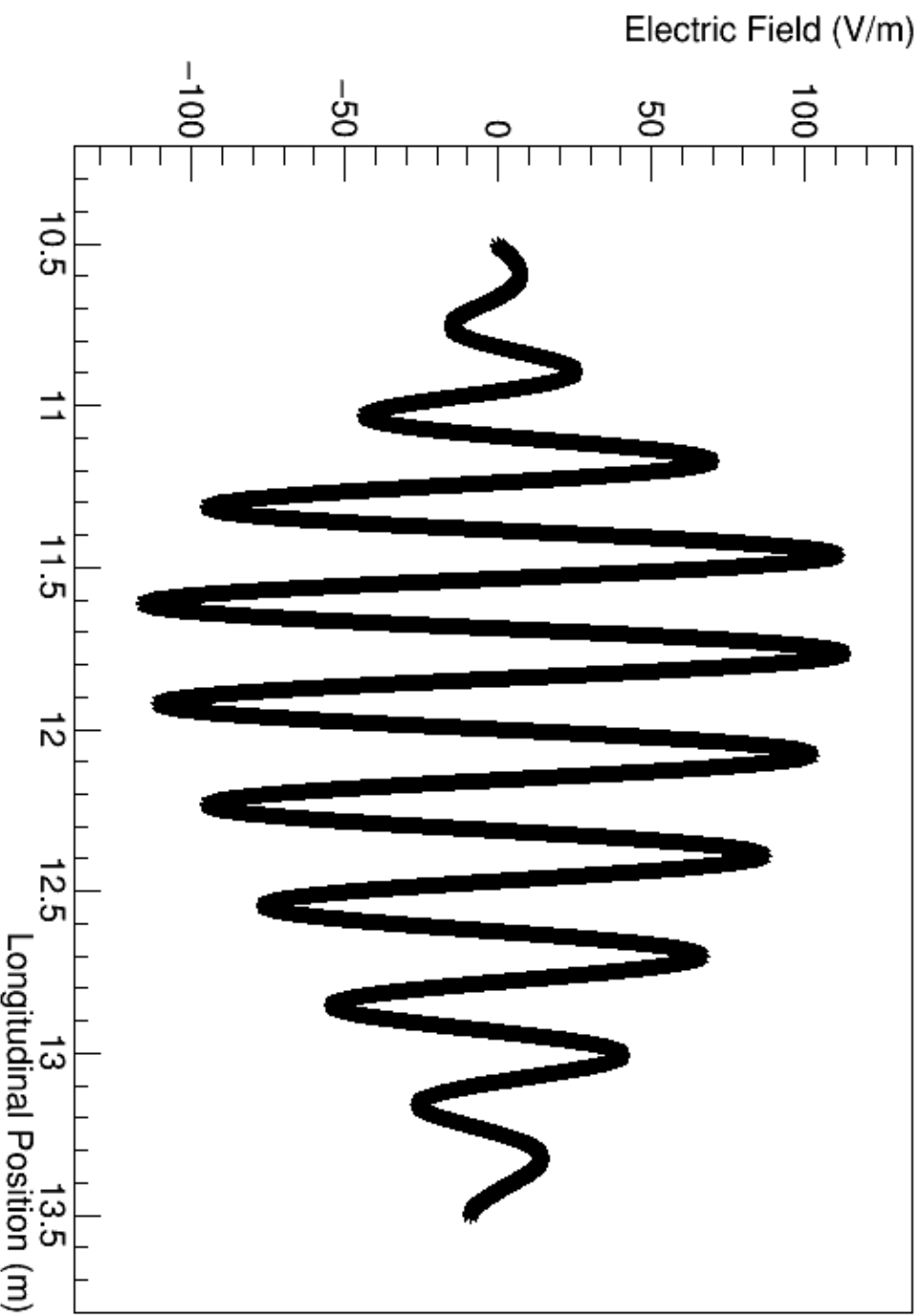
Proper Conversion to Single-Electron Field

- Leonard-Wiechart predicts field of peak magnitude:

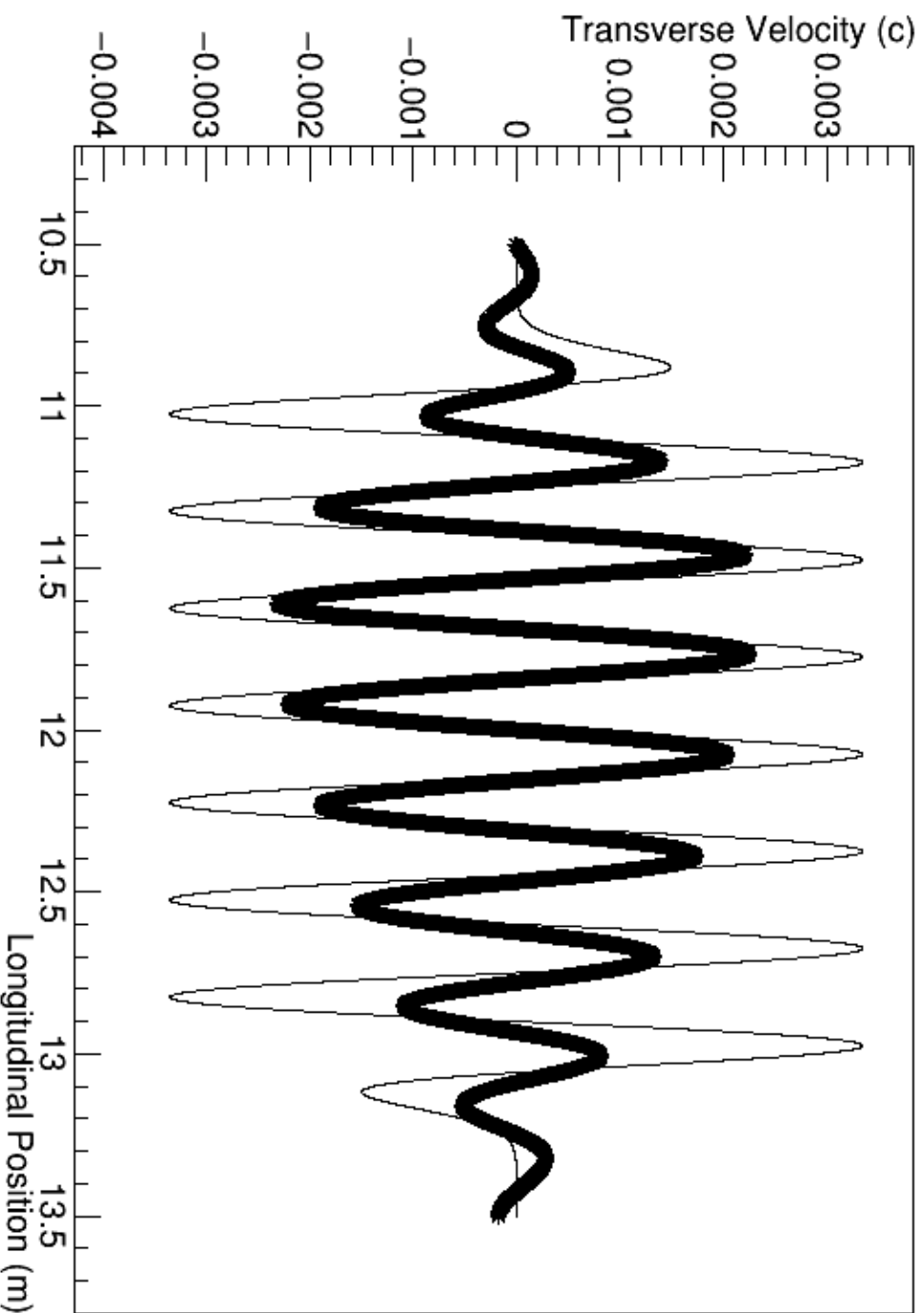- $e \, K \, k_u \, \gamma^3 \, / \, (\pi \, \varepsilon_0 \, R \, (1+K^2/2))$

- (assuming constant longitudinal velocity, and transverse sinusoidal motion)

- 6 meters out (no focusing), field should be 9.68 V/m

- We simulate a field of 42.7 V/m — fudge factor is 0.23

- Running with something like Matt's parameters, we get kick of 29 meV (comparable to his 35 meV)

Wavepacket at 2nd Undulator

Wavepacket at 2nd Undulator

Transverse Velocity (c)

Longitudinal Position (m)

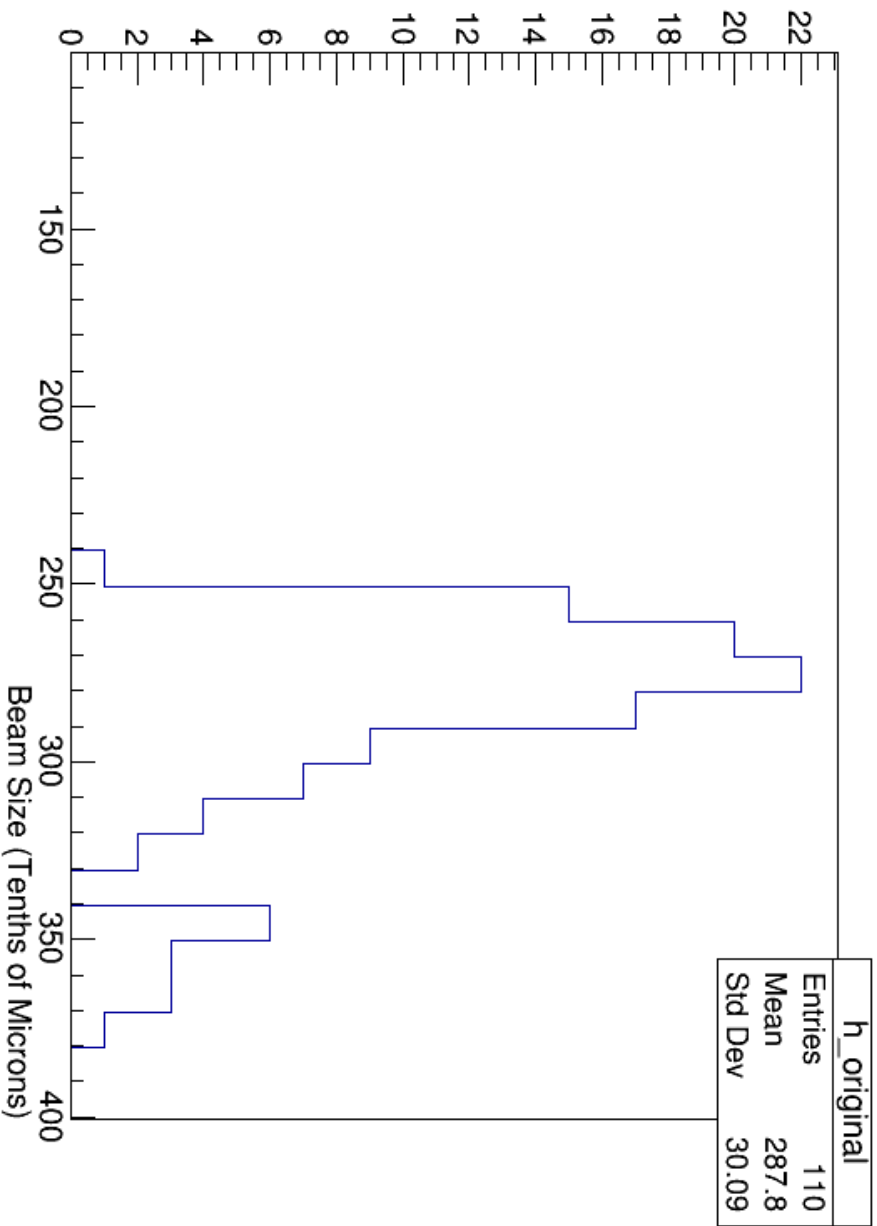**Energy transfer is 290 meV**

Future

- Study how a larger incoherent kick will affect the cooling

Sloppy Models Updates

- Results from November 14 data-taking
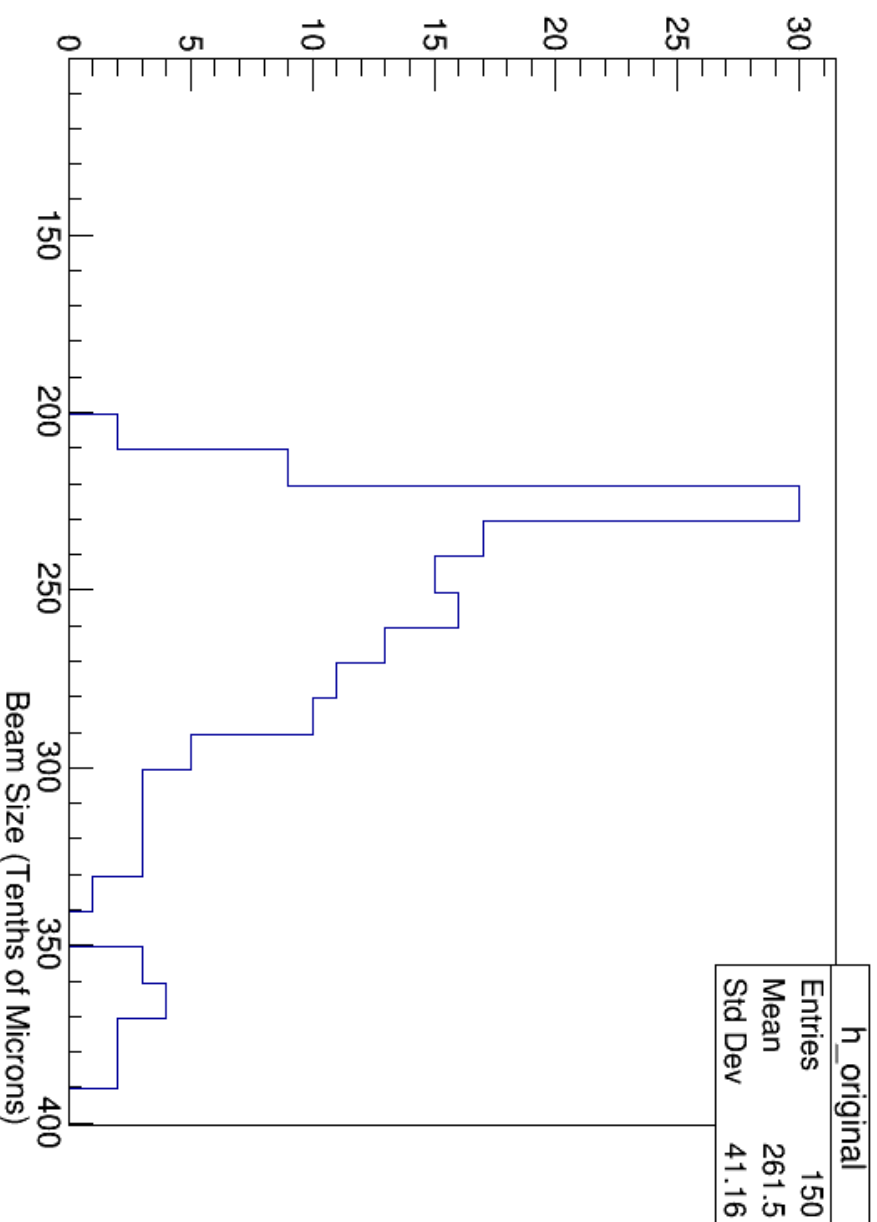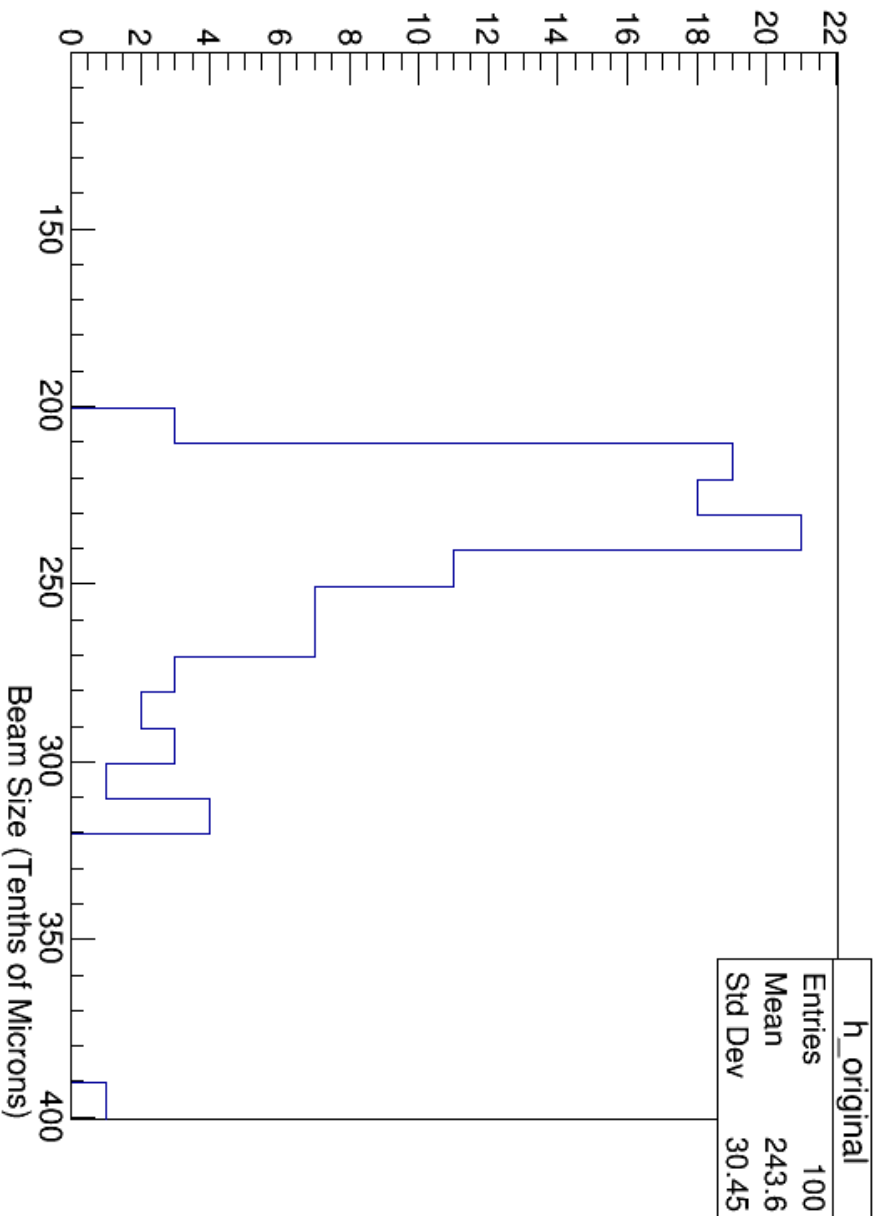
No Knobs

Mean is 28.78 ± 0.29 microns

h_original	
Entries	110
Mean	287.8
Std Dev	30.09

Beam Size (Tenths of Microns)

Standard Knobs

Mean is 26.15 ± 0.34 microns

h_original	
Entries	150
Mean	261.5
Std Dev	41.16

Beam Size (Tenths of Microns)

Prior-Info Knobs

Mean is 24.36 ± 0.30 microns

h_original	
Entries	100
Mean	243.6
Std Dev	30.45

Beam Size (Tenths of Microns)

Improvement from Prior Info

- Prior info improvement is 1.79 ± 0.45 microns
- Cuts on data make the improvement ~1 micron