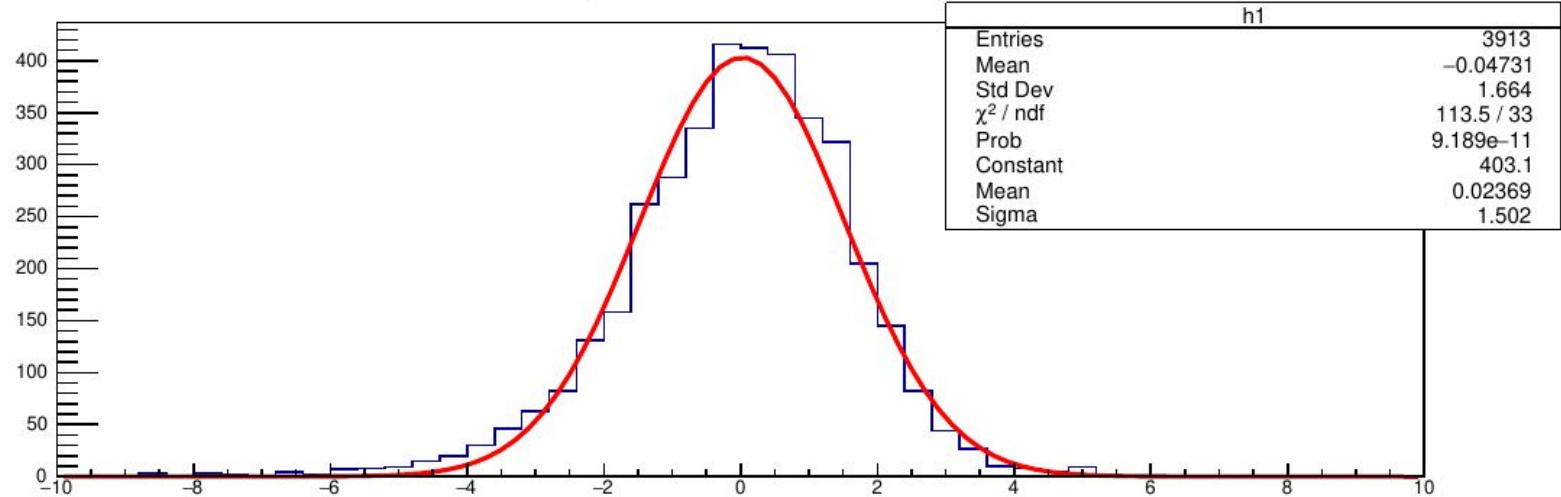# Quadbar Testbeam Data

Correspondence between position as indicated by wirechamber vs. position calculated from SiPM counts of adjacent quadbar cells
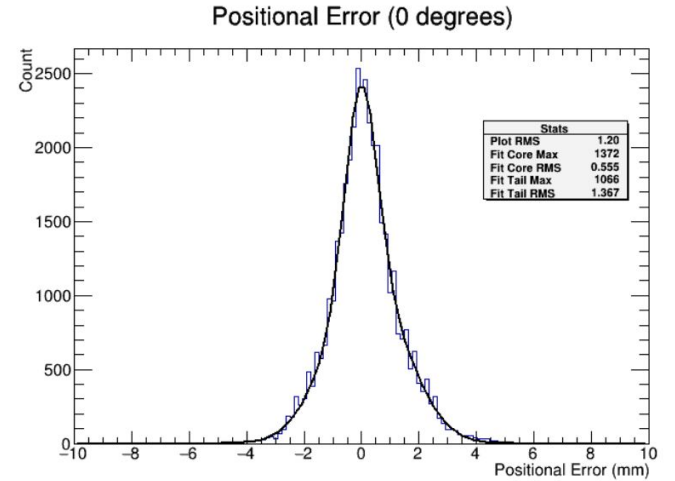
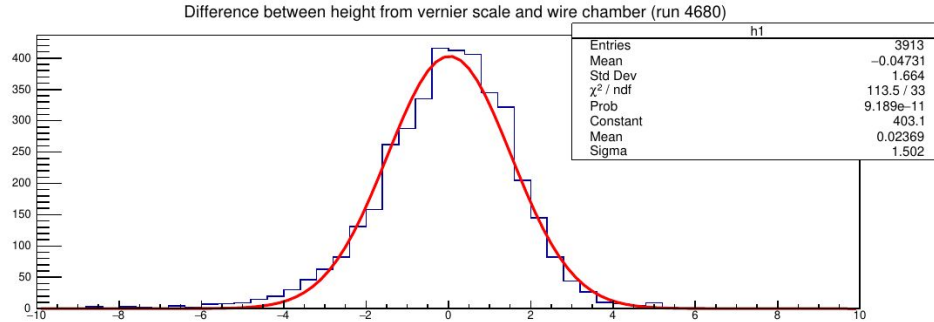# Position reconstruction from SiPM counts

$$Z = P_2 + \Delta Z = \frac{E_1 P_1 + E_2 P_2}{E_1 + E_2}$$

Discrepancy in position

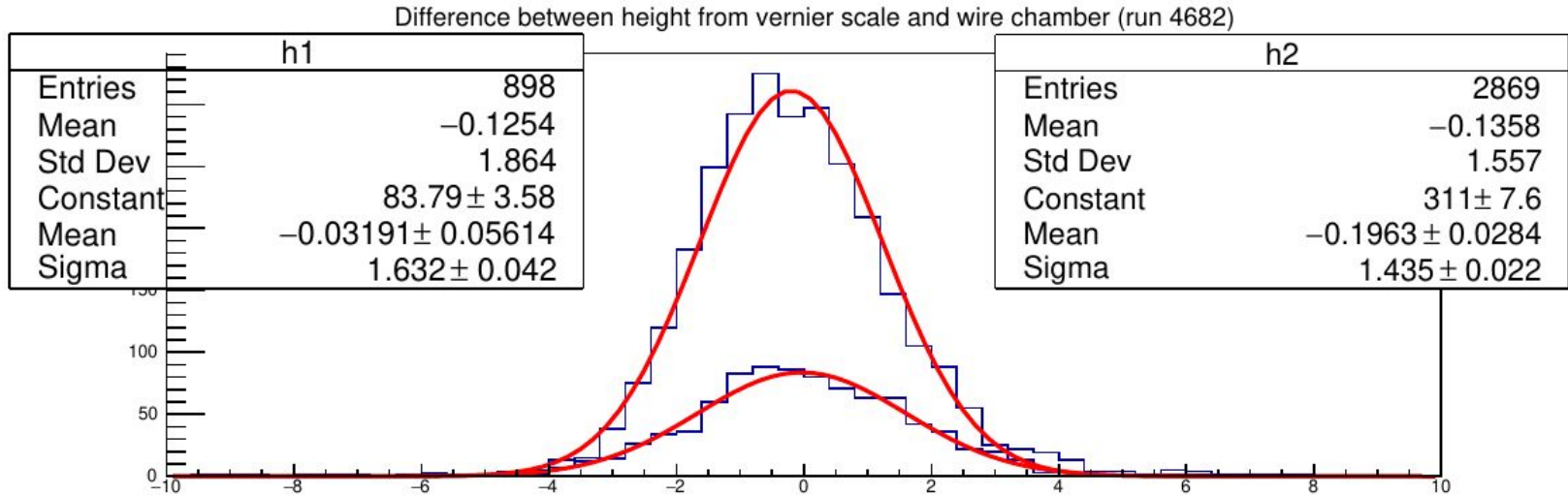Difference between height from vernier scale and wire chamber (run 4680)

h1	
Entries	3913
Mean	−0.04731
Std Dev	1.664
χ^2 / ndf	113.5 / 33
Prob	9.189e−11
Constant	403.1
Mean	0.02369
Sigma	1.502

Comparison to simulation results

Difference between height from vernier scale and wire chamber (run 4680)

h1	
Entries	3913
Mean	−0.04731
Std Dev	1.664
χ^2 / ndf	113.5 / 33
Prob	9.189e−11
Constant	403.1
Mean	0.02369
Sigma	1.502

Positional Error (0 degrees)

Stats	
Plot RMS	1.20
Fit Core Max	1372
Fit Core RMS	0.555
Fit Tail Max	1066
Fit Tail RMS	1.367

Discrepancy in position (mostly on the edge of triangles)

Difference between height from vernier scale and wire chamber (run 4682)

h1	
Entries	898
Mean	−0.1254
Std Dev	1.864
Constant	83.79 ± 3.58
Mean	−0.03191 ± 0.05614
Sigma	1.632 ± 0.042

h2	
Entries	2869
Mean	−0.1358
Std Dev	1.557
Constant	311 ± 7.6
Mean	−0.1963 ± 0.0284
Sigma	1.435 ± 0.022

Discrepancy plotted against position

Discrepancy vs. position (run 4680)
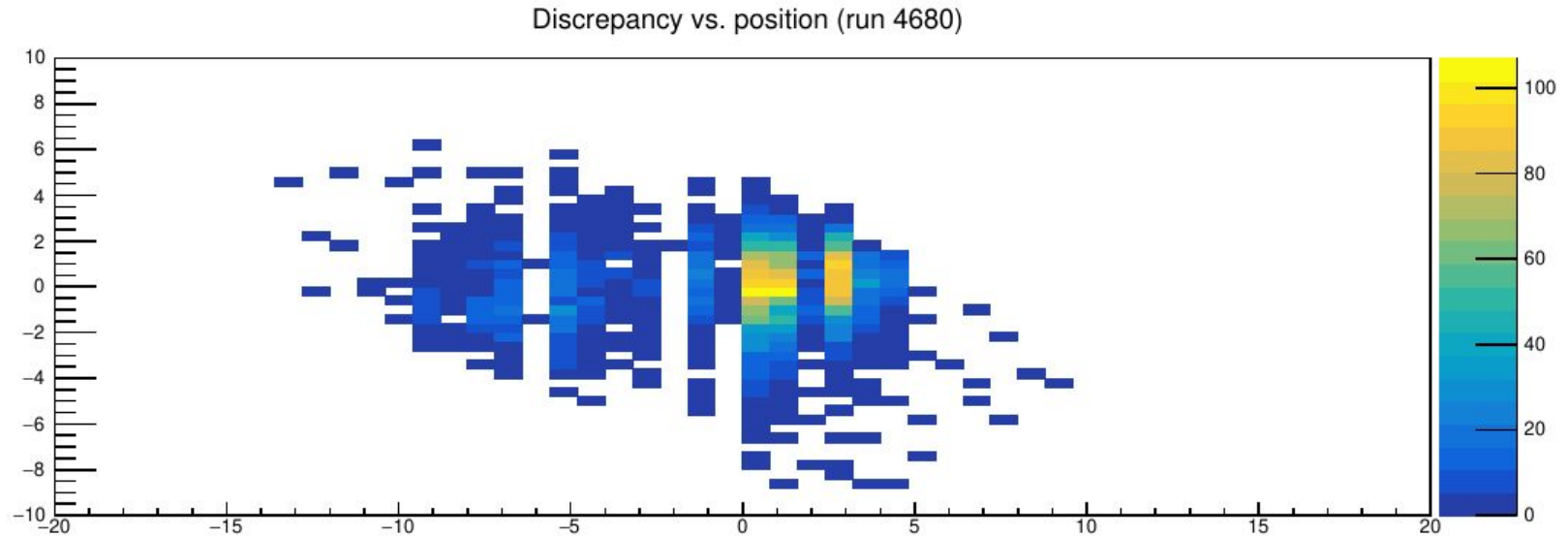
Discrepancy plotted against position (across an edge)

Discrepancy vs. position (run 4682)