Parameterization

Josiah D. Kunz

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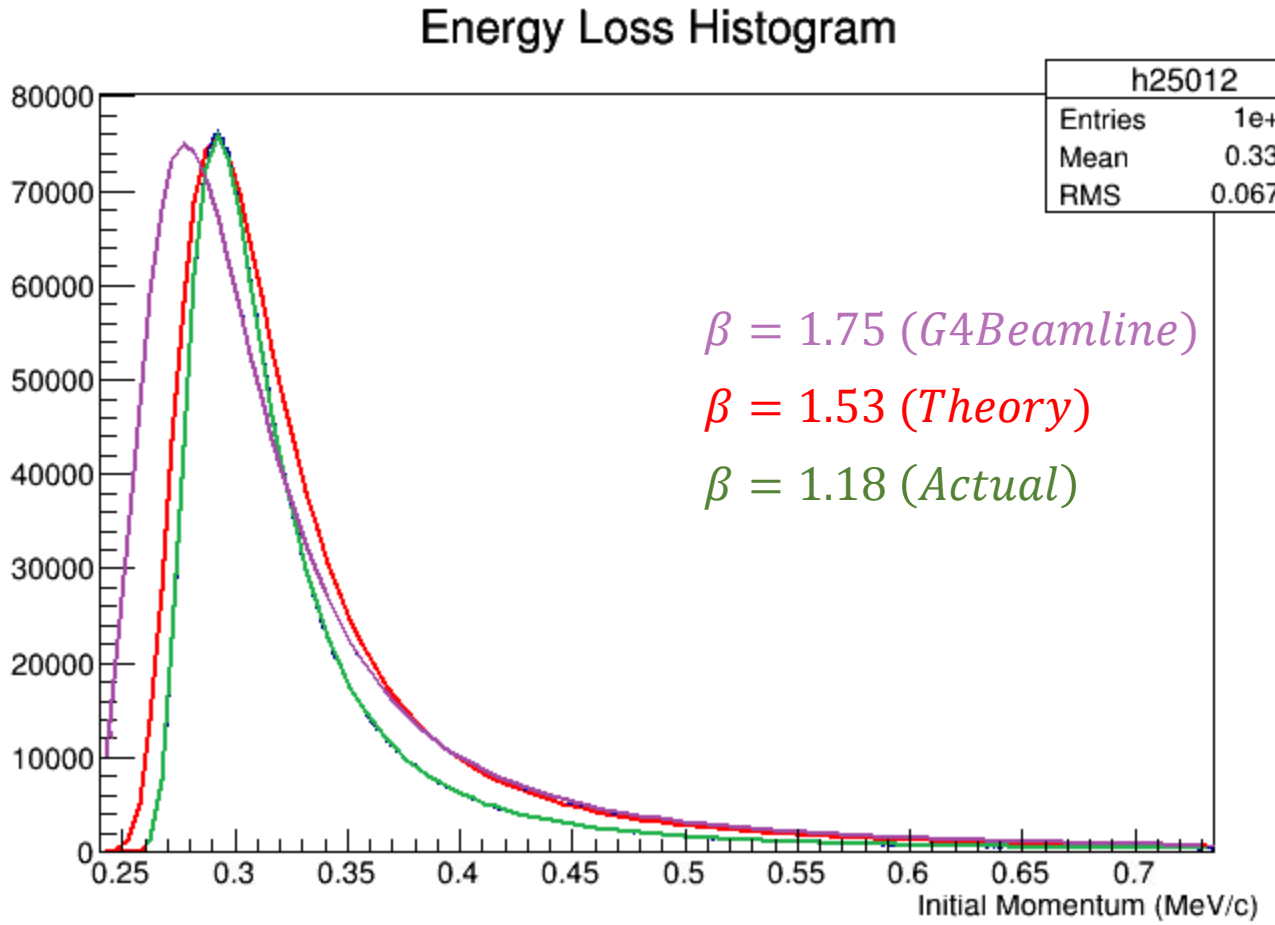
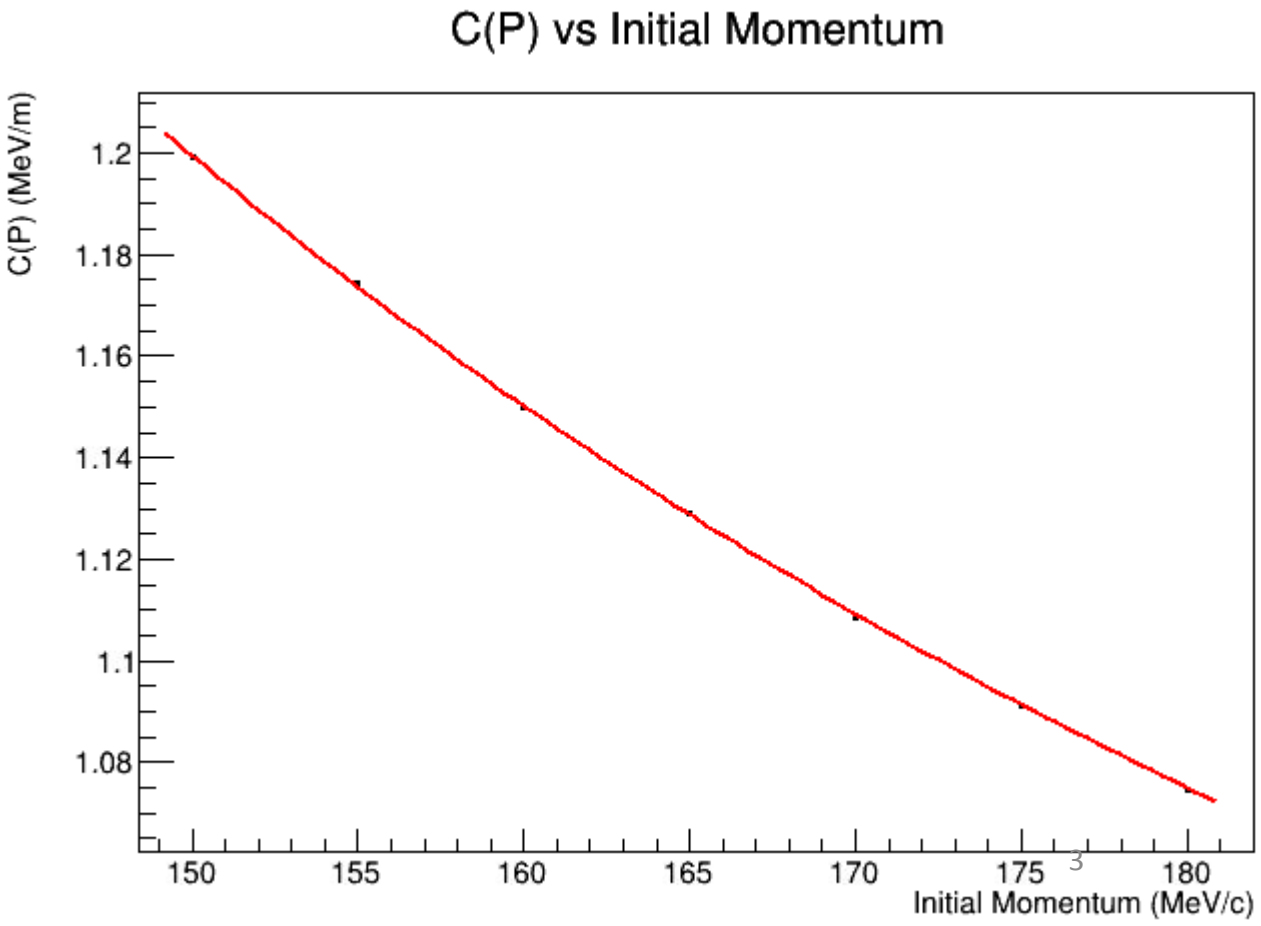
Last Time…

- G4Beamline's disagreement likely due to precision error.
- EX: $\left(P_x, P_y, P_z\right)_{final} =$
  $-0.521128, 0.427832, 249.573$
  $\Delta E = 0.392426$
- EX: $\left(P_x, P_y, P_z\right)_{final} =$
  -0.521127, 0.427831, 249.572
  $\Delta E = 0.393347$
- Histogram bin width is 0.00225.



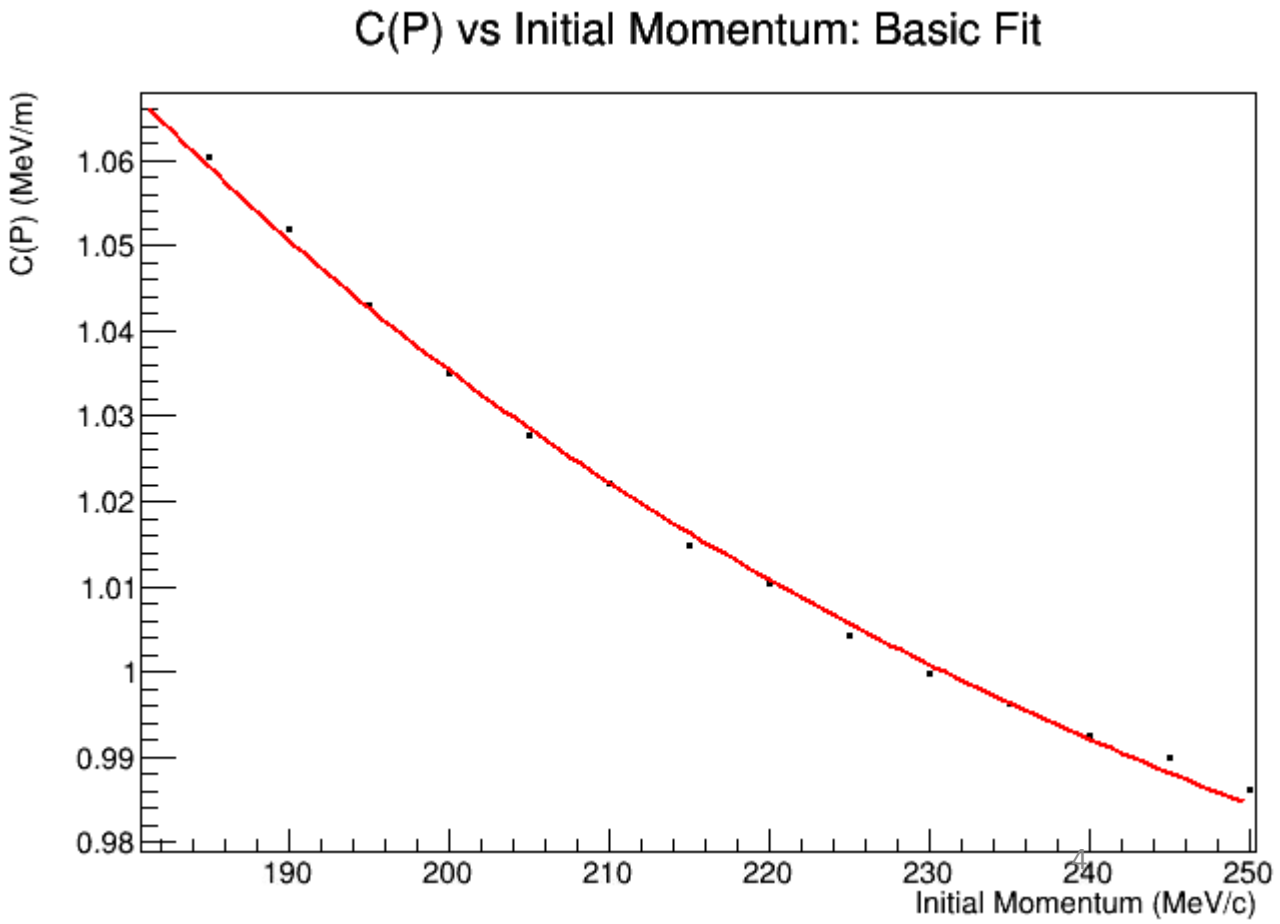
Vavilov Region: $P \epsilon (150, 180)$

- Recall $\beta = C(P) * L$
- $C(P) = [0] * \left(\frac{[1]}{P^2} + 1\right)$
- $\chi^2 = 1.29E\text{-}6$



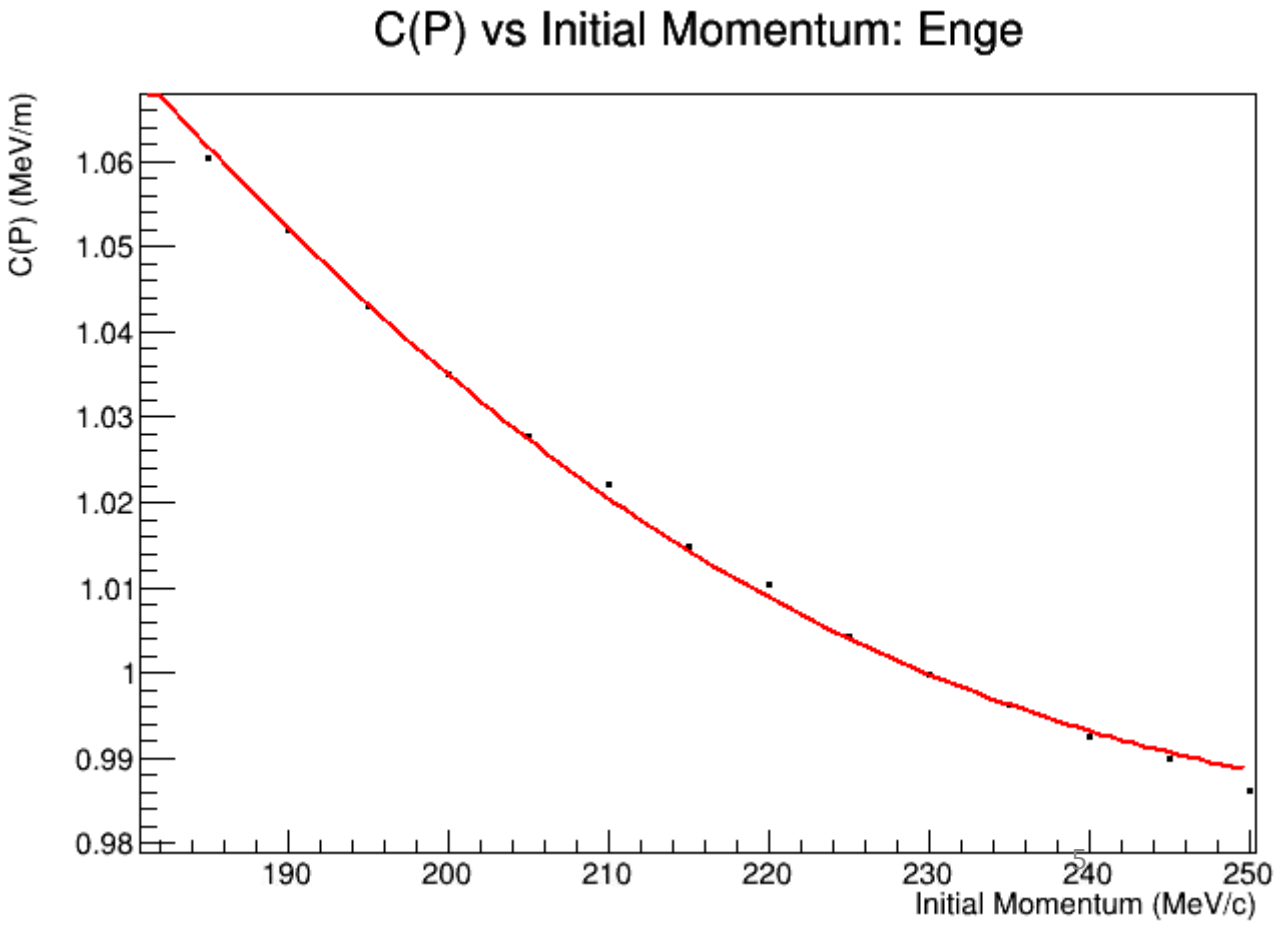
Landau Region: $P \epsilon (181,250)$ (Basic)

- $C(P) = [0] * \left(\frac{[1]}{P^2} + 1\right)$
- $\chi^2 = 1.62E\text{-}5$



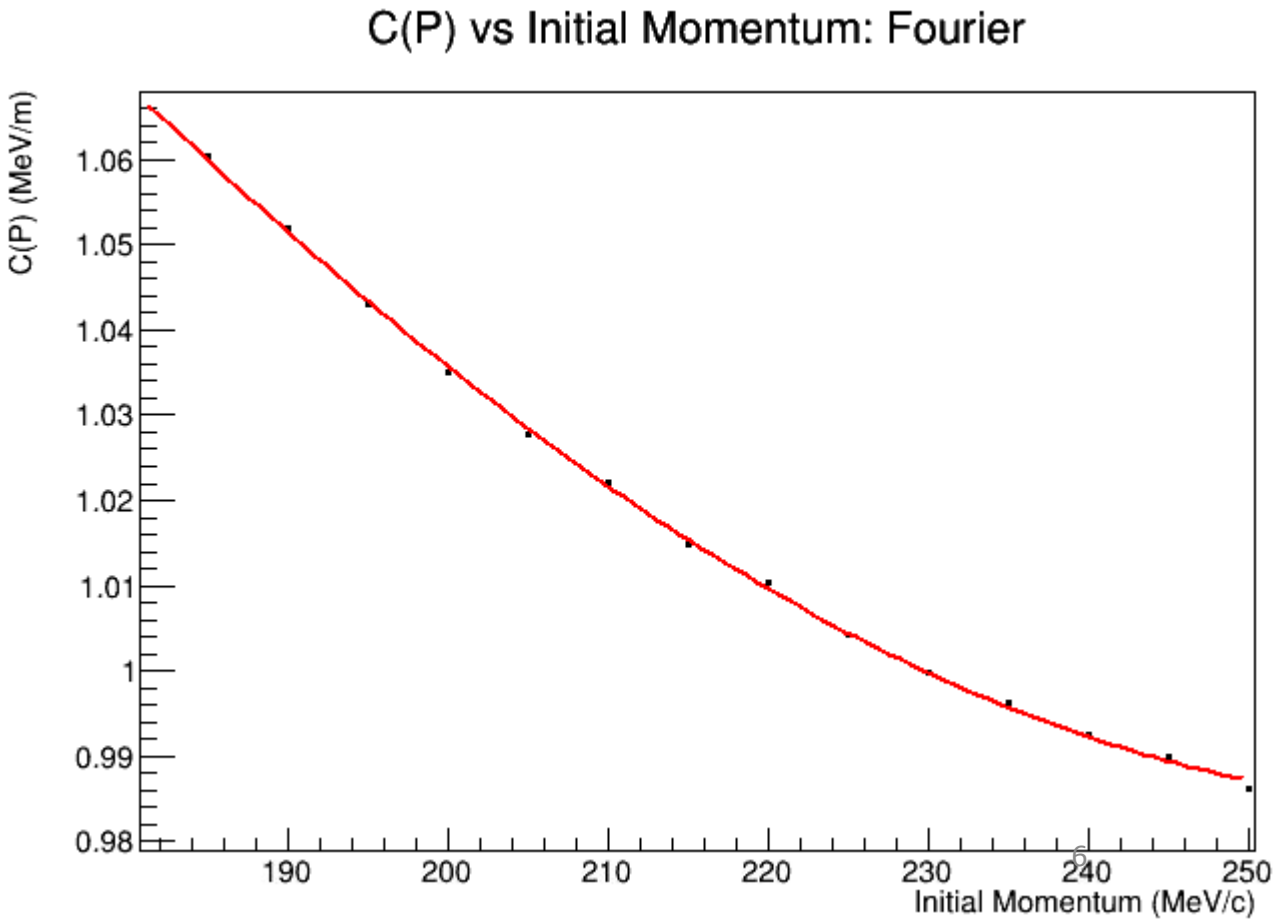
Landau Region: $P \epsilon (181,250)$ (Enge)

- $C(P) = [0]/(1 + Exp([1] + [2]u + [3]u^2)) + [5]$
- $u = x - [4]$
- $\chi^2 = 1.37E\text{-}5$

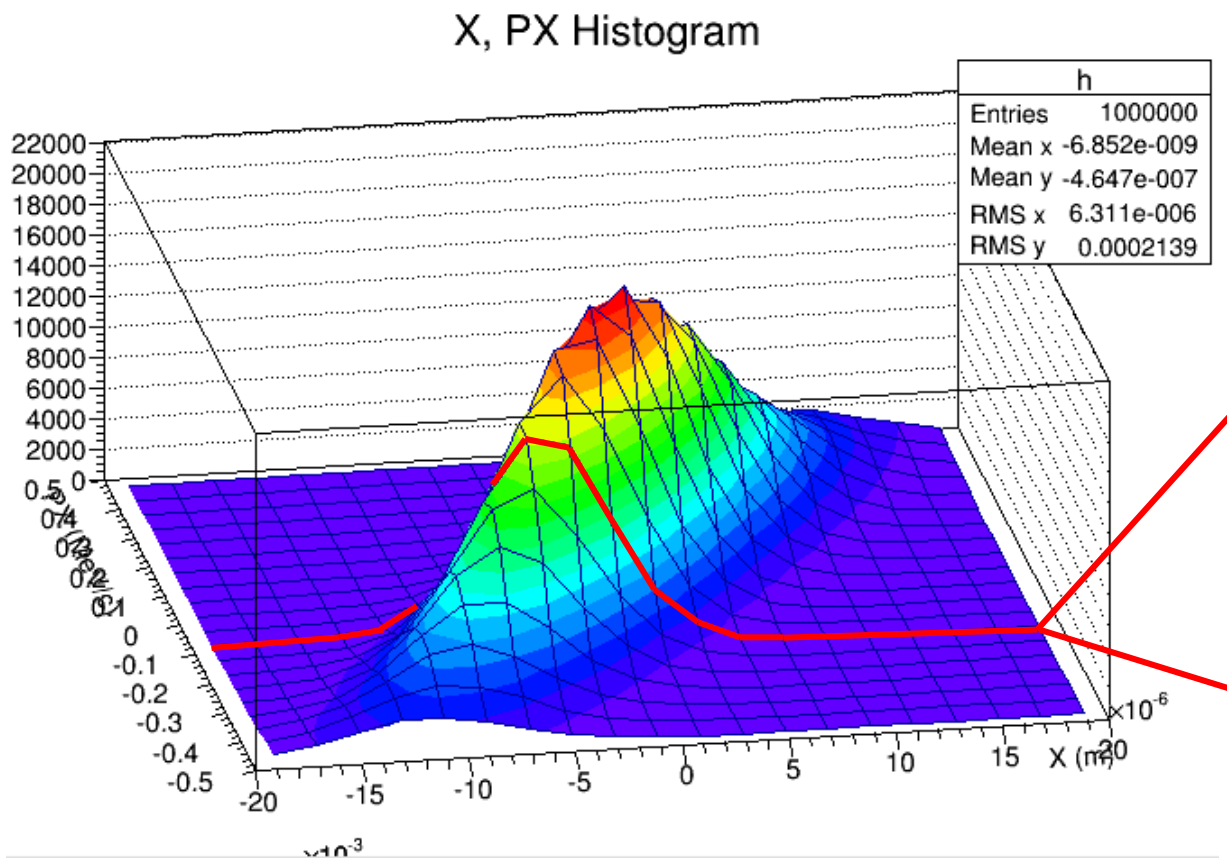


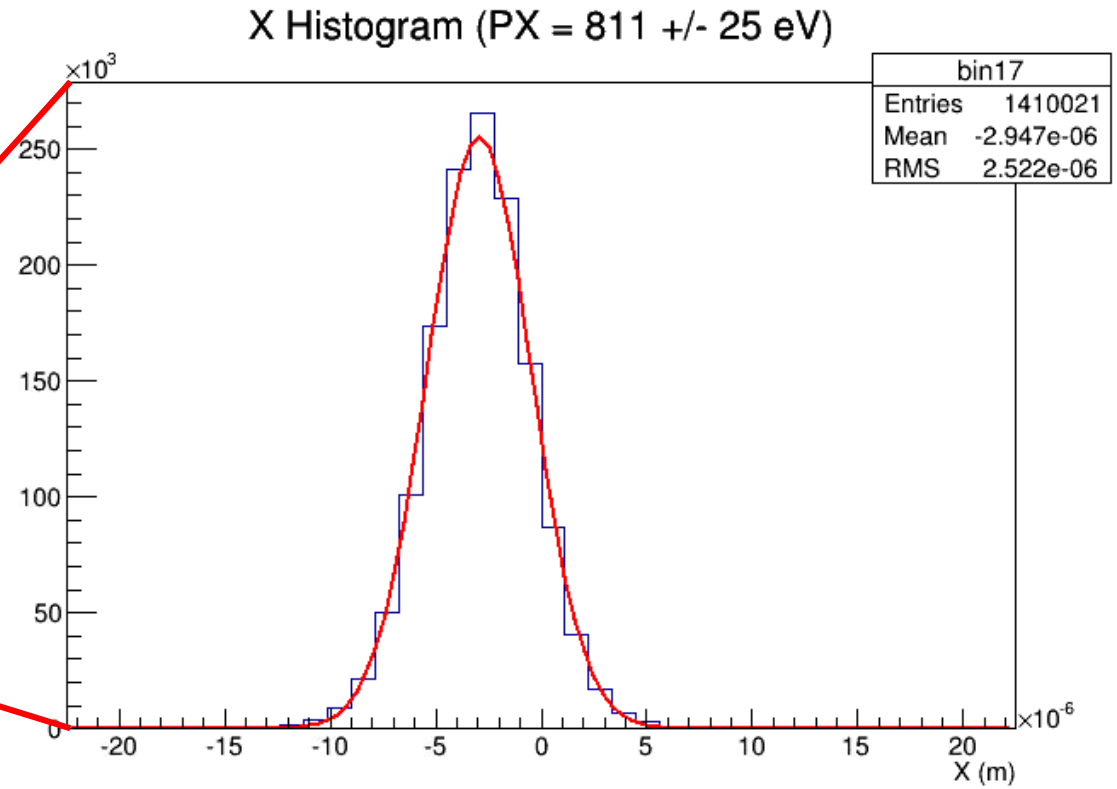
Landau Region: $P \epsilon (181,250)$ (Fourier)

- $C(P) = [0]([1]\sin(v) + [2]\sin(2v) + [3]\sin(3v))$
- $v = \frac{x-[4]}{[5]}$
- $\chi^2 = 4.68E\text{-}6$



X, PX Coupling





Simulation used 10M particles with $P_{z_i} = 200\ MeV/c$ through $L = 8\ mm$ LH2.

X, PX Coupling