

Slides Exp - Data; Sourcode Revision: 39/40;
Root Script: 01_Slides/02_Slides

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Multiple Particles

Θ Matching

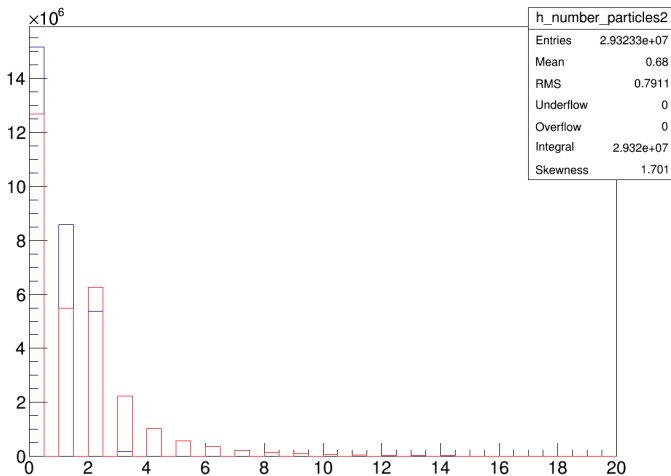
Carbon Scaling

Relative Efficiency Correction

Backup

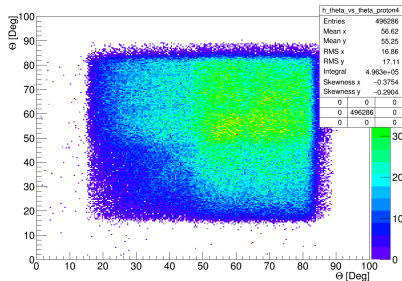
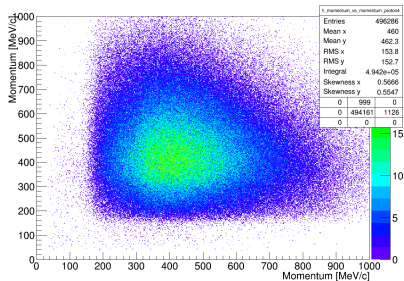
Number of Candidates in HParticleCand

- Red: Before, Blue: After Cleaning of Multiple Particles



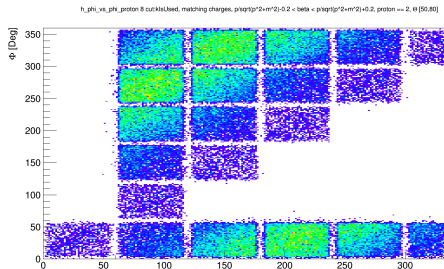
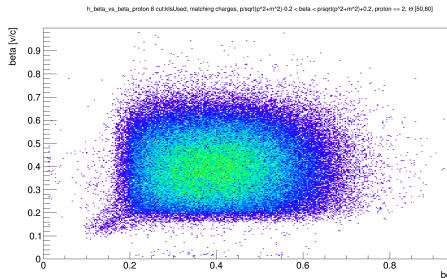
Test if this is working

- ▶ If more than one proton/pion is found correlate them
- ▶ Plots only for protons, but look similar for pions, Cuts: PID



Take a look at the Θ from 50-80

- Plot β vs β and Φ vs Φ

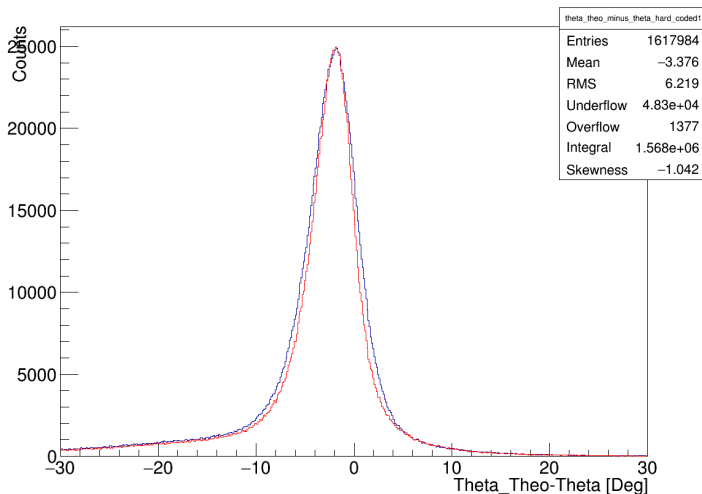


Cut Description

- ▶ For all plots $klsUsed = 1$ is used
- ▶ $n = 2$: Ask for 2 Particle Candidates
- ▶ PID: $p/\sqrt{(p^2 + m^2)} - 0.2 < \beta < p/\sqrt{(p^2 + m^2)} + 0.2$
- ▶ $\Delta\Phi := \sqrt{(\Phi_{particle1} - \Phi_{particle2})^2}$
- ▶ $\Delta\Theta := \sqrt{(\Theta_{Expected} - \Theta_{Measured})^2}$
- ▶ $\Delta p :=$ difference to the hard coded momenta

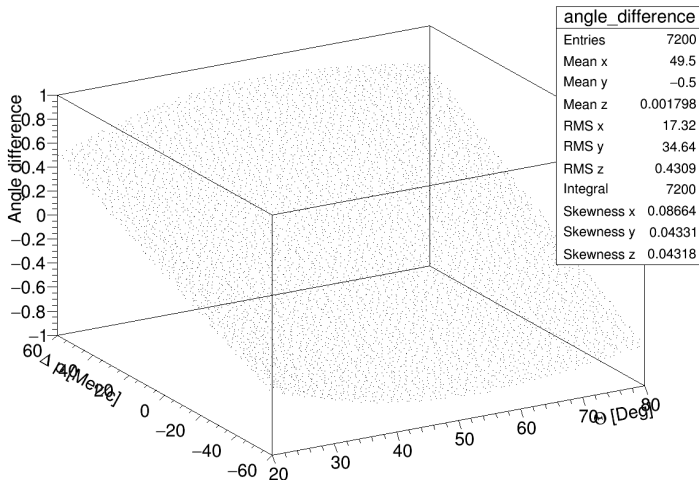
⊖ Matching

- ▶ Plotting $\Delta\Theta$, Red: Pion Tracker, Blue: Hard Coded
- ▶ Cuts: $n = 2$, $\Delta\Phi = 180 \pm 5$



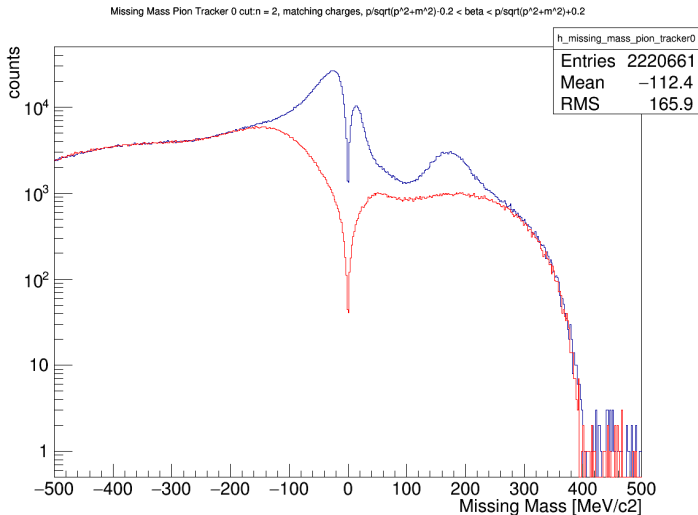
⊖ Matching - Theoretical Improvement

- ▶ Scanning $\Delta p \pm 60 \text{ MeV}/c$ and $20 < \Theta < 80$ and calculated difference to hard coded angle



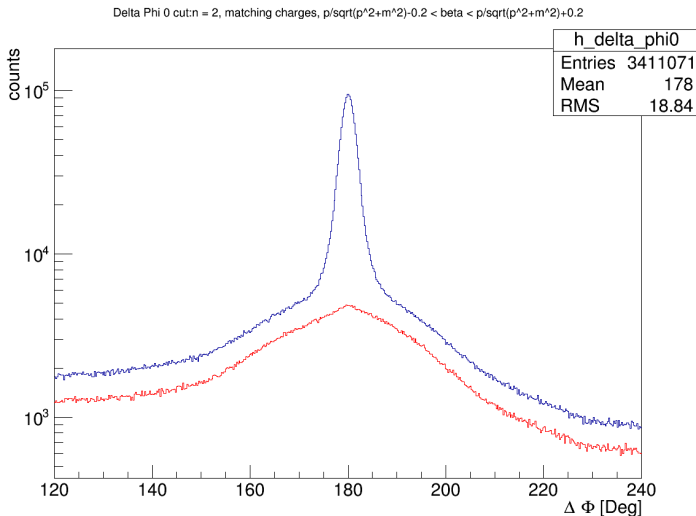
Carbon to PE Scaling

- ▶ Integrate Data from -500 to -200 in PE and C and calculated scaling factor
- ▶ Cuts: $n = 2$, PID



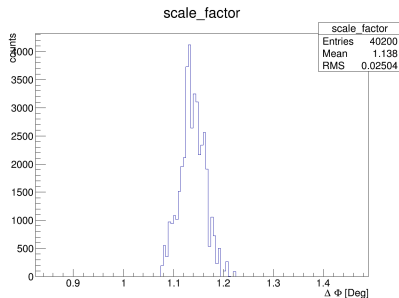
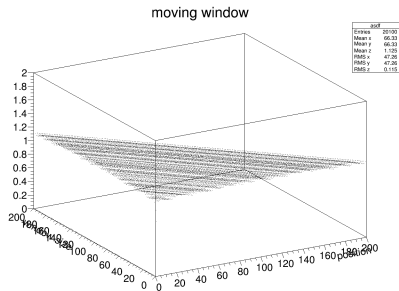
Cross Check Scaling Using Missing Mass

- ▶ Using the scaling factor to see if $\Delta\Phi$ plot is matching
- ▶ Cuts: $n = 2$, PID



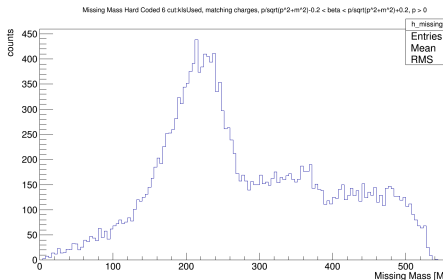
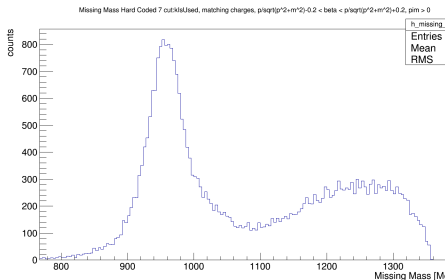
Cross Check Scaling Using Missing Mass

- ▶ Also done: the otherway: first fitting $\Delta\Phi$ [120,170] plot and checking Missing Mass
- ▶ Same Problem, but Checked Fit window dependency
- ▶ tested for: begin fit \in [120,170], [190,240]; fit window \in [1,50]



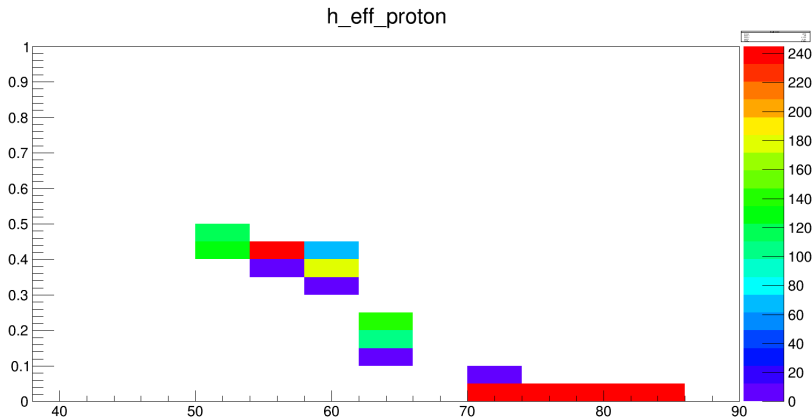
Relative Efficiency Correction e.g. (Protons)

- ▶ Using Pion and Calculating Missing Mass (right now without pion tracker)
- ▶ Cut on Protons [900, 1027] (Pions [155, 270])
- ▶ Using p_{pion} , p'_{pion} , Θ_{pion} to calc $\Theta_{protonexpected}$
- ▶ Inside detector: Expected + 1, $\Delta\Theta < 5$: Measured + 1
- ▶ Cuts: PID, more than 0 Pions



Relative Efficiency Correction e.g. (Protons)

- ▶ Now slice Θ from 50-70 into 6 slices (each 5 degree)
- ▶ Calculate efficiency (measured/expected) for each slice

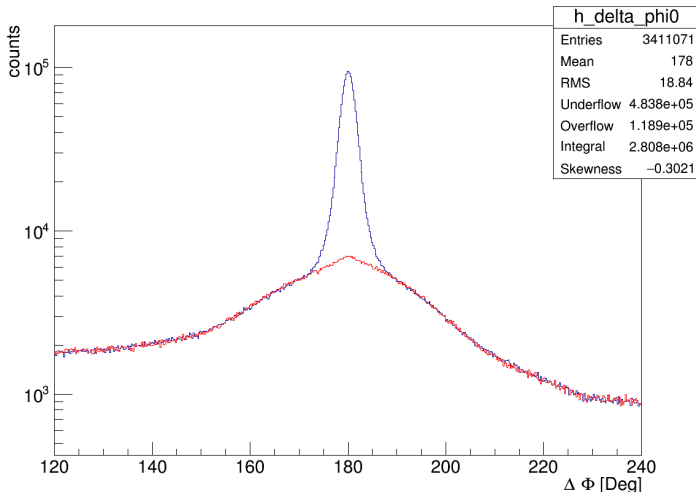


Relative Efficiency Correction open tasks

- ▶ trigger bias in efficiency?
- ▶ momentum slices
- ▶ separate RPC/TOF
- ▶ cut ranges not perfectly matching Romaines
- ▶ other tasks:
 - ▶ correct data from Carbon (scaling factor)
 - ▶ simulation for efficiency correction
 - ▶ additional smaller tasks

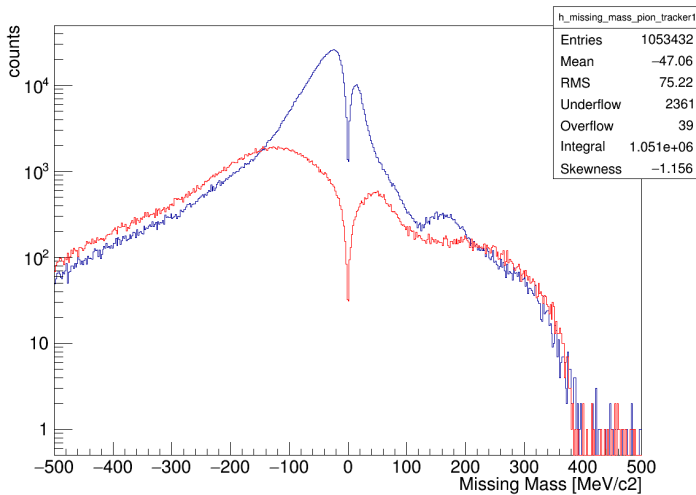
Carbon to PE Scaling

- ▶ Using Data from 120-167 Degree for Scaling, Blue: PE Data, Red: Scaled Carbon Data
- ▶ Cuts: PID



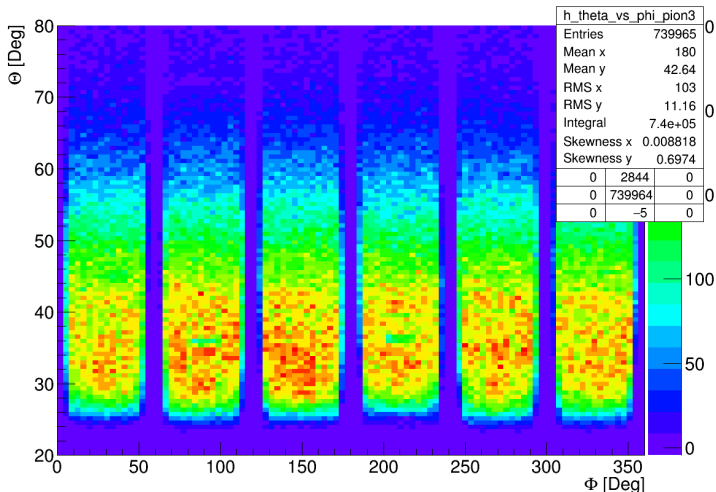
Cross Check Scaling Using Missing Mass

- ▶ Using the scaling factor to see if both missing plots are matching
- ▶ Cuts: $\Delta\Phi = 180 \pm 5$



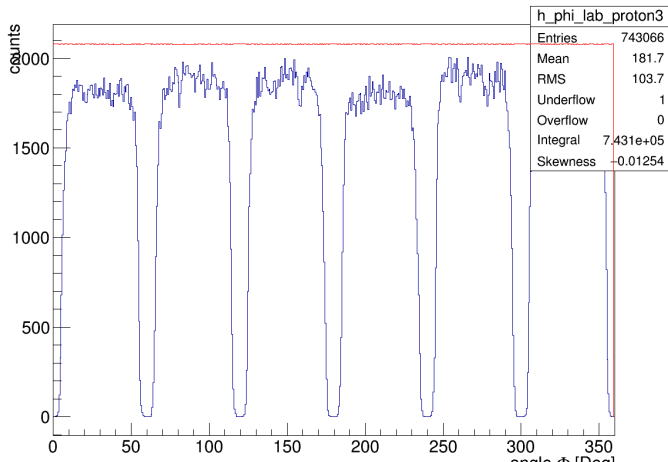
Θ vs Φ for Pions

- ▶ Carbon Corrected
- ▶ Cuts: $\Delta\Phi = 180 \pm 5$, $\Delta\Theta_{\text{expected}} \pm 5$, Momentum from Pion Tracker



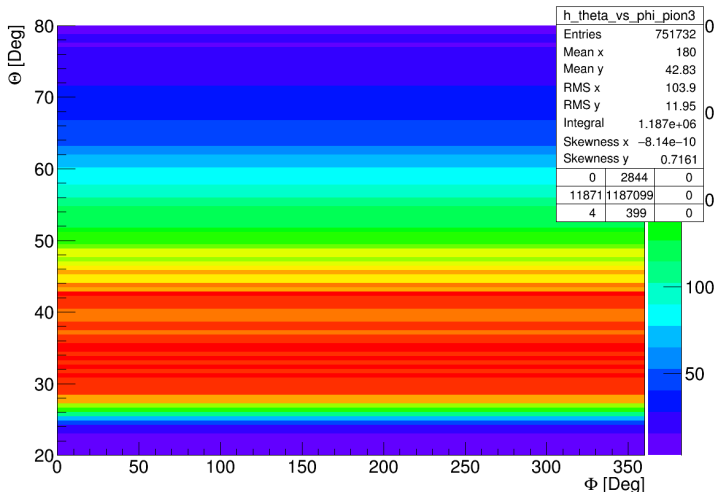
Relative Efficiency Correction Φ (Protons)

- ▶ Carbon Corrected, Entries: Uncorrected: 7.4×10^5 , Corrected: 10.3×10^5
- ▶ Cuts: $\Delta\Phi = 180 \pm 5$, $\Delta\Theta_{expected} \pm 5$, Momentum from Pion Tracker



Relative Efficiency Correction Θ vs. Φ (Pions)

- ▶ Carbon Subtracted
- ▶ Cuts: $\Delta\Phi = 180 \pm 5$, $\Delta\Theta_{expected} \pm 5$, Momentum from Pion Tracker



Relative Efficiency Correction Θ vs. Φ Scaling Map

- ▶ Carbon Subtracted
- ▶ Cuts: $\Delta\Phi = 180 \pm 5$, $\Delta\Theta_{expected} \pm 5$, Momentum from Pion Tracker

