



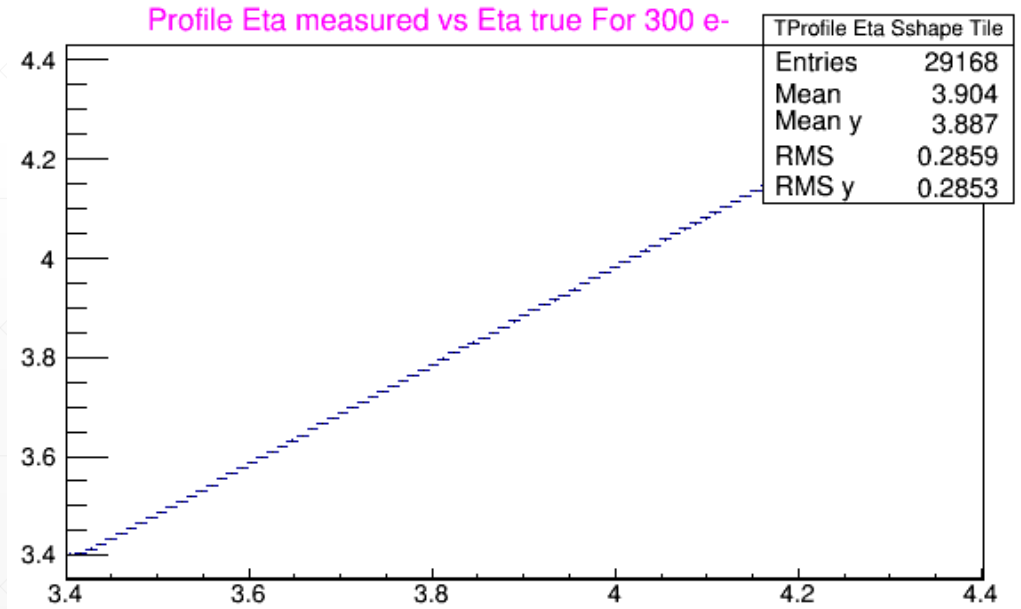
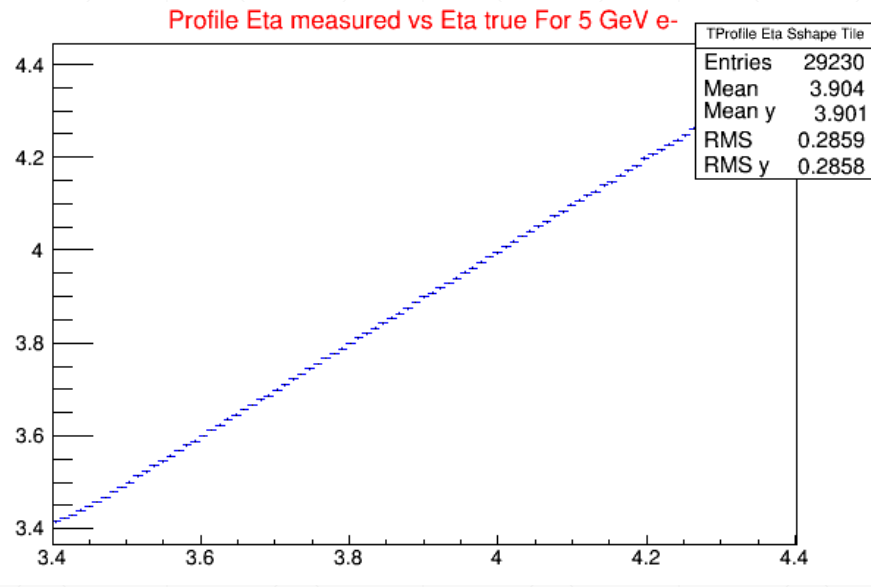
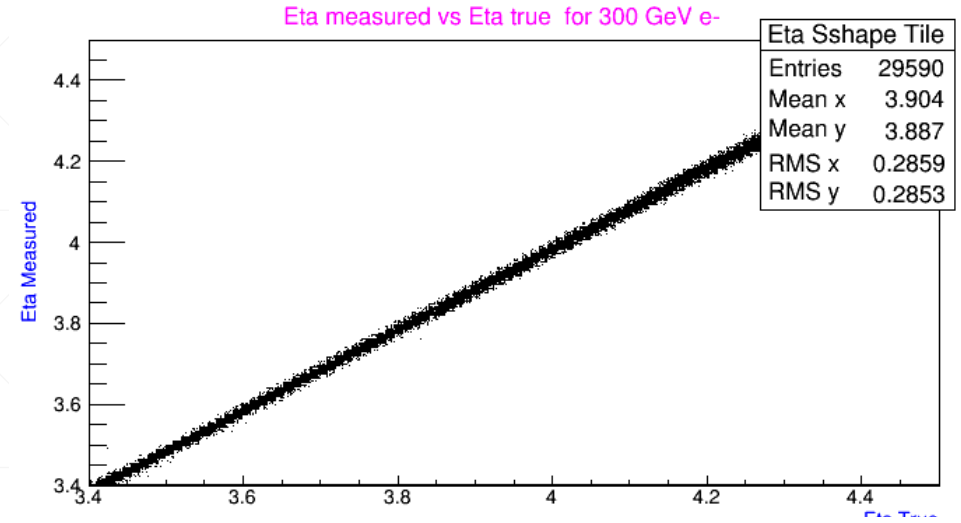
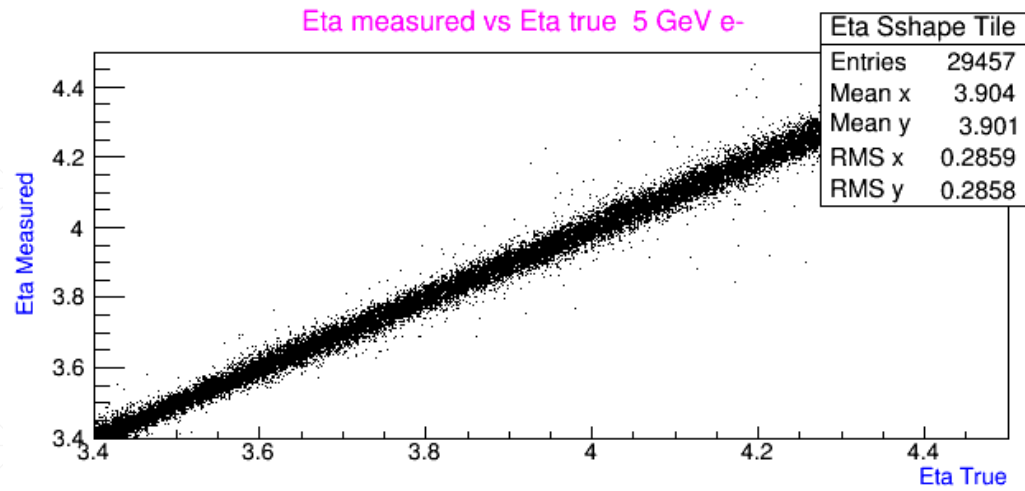
*Mohamed I University
Faculty of Sciences
Oujda*

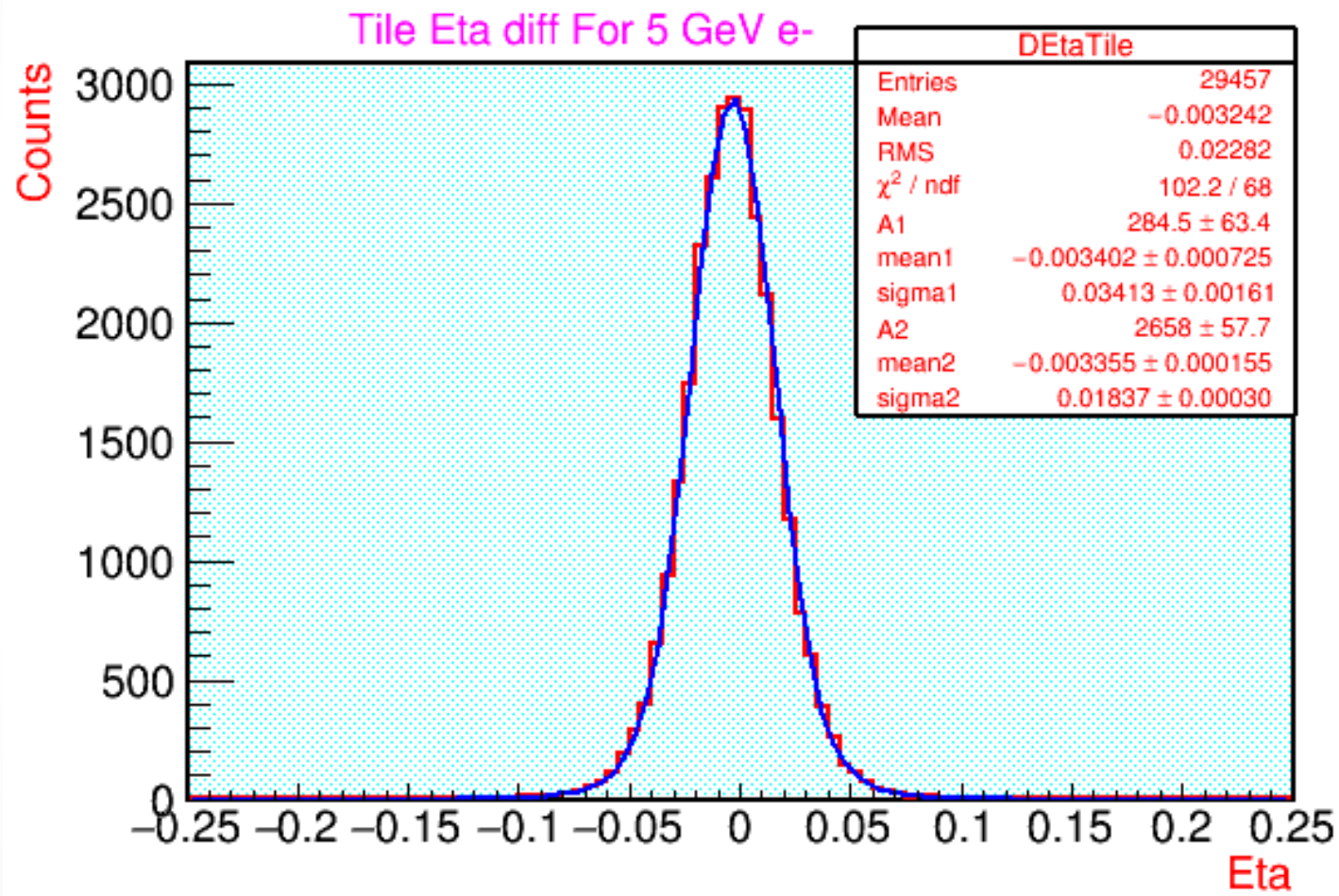
FCAL Analysis Pointing Resolution

Dahbi Salah-Eddine
Laboratory of Physics of Matter and Radiation

Electrons Data Analysis

Eta Tile S-Shape





- *Difference in Eta between measured and true particle direction*

- *5 GeV e-*

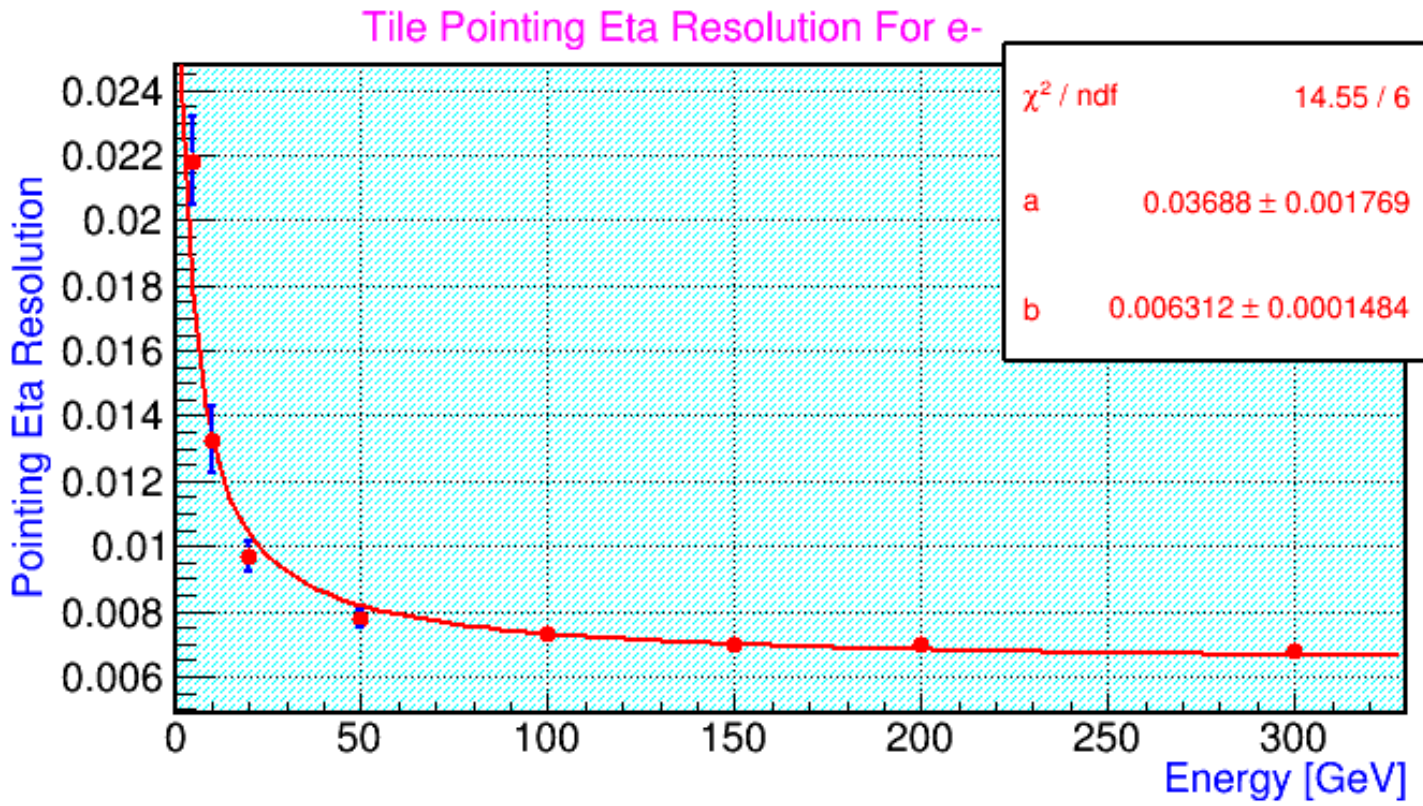
- *Fit with Double Gaussian:*

➤ *Pointing Eta Resolution*

$$\sigma_{\eta} = 0.0217864 \pm 0.00135445$$

- *Pointing η Resolution vs Energy*
- *Fit with :*

$$\sigma_{\eta} = \frac{a}{\sqrt{E}} \oplus b$$

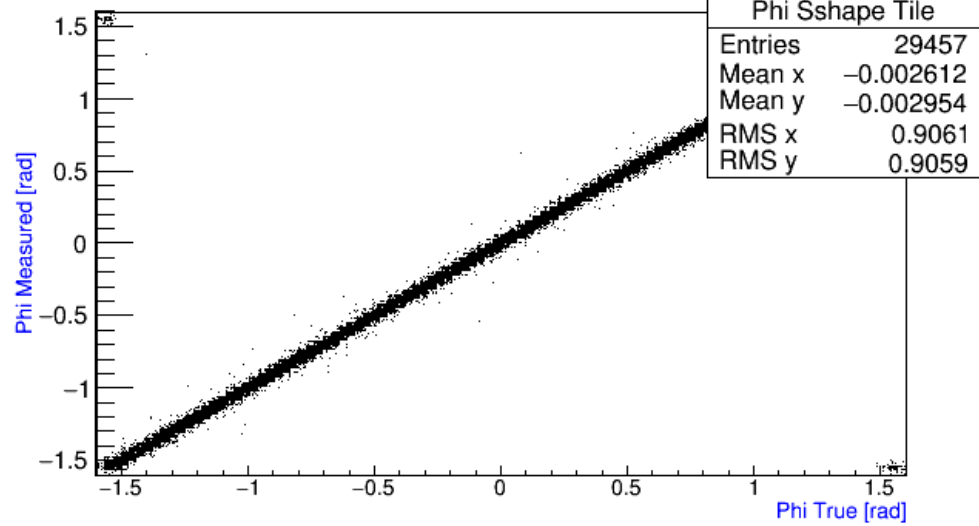


$$a = 0.03688 \sqrt{GeV}$$

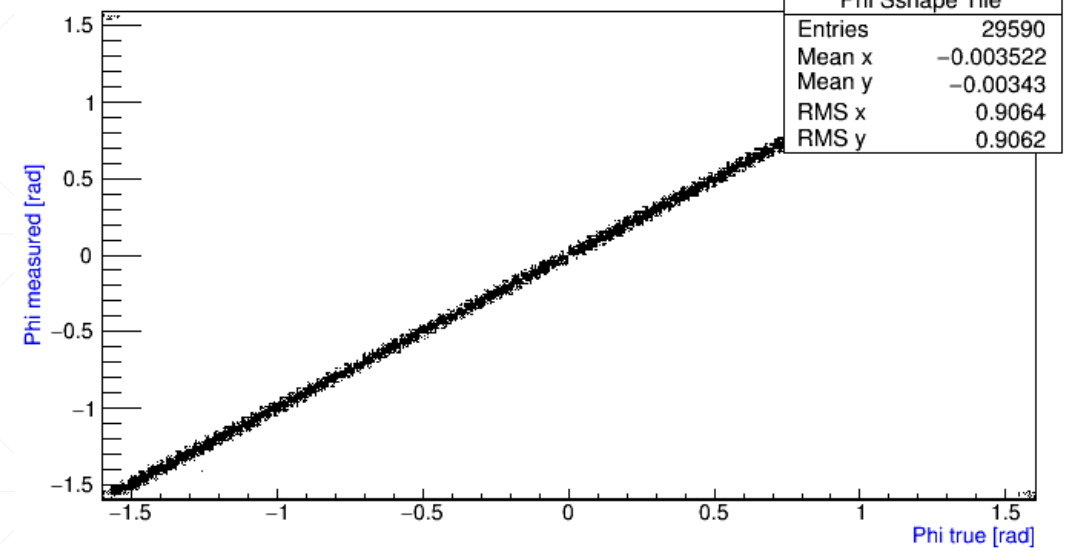
$$b = 0.006312$$

Phi Tile S-Shape

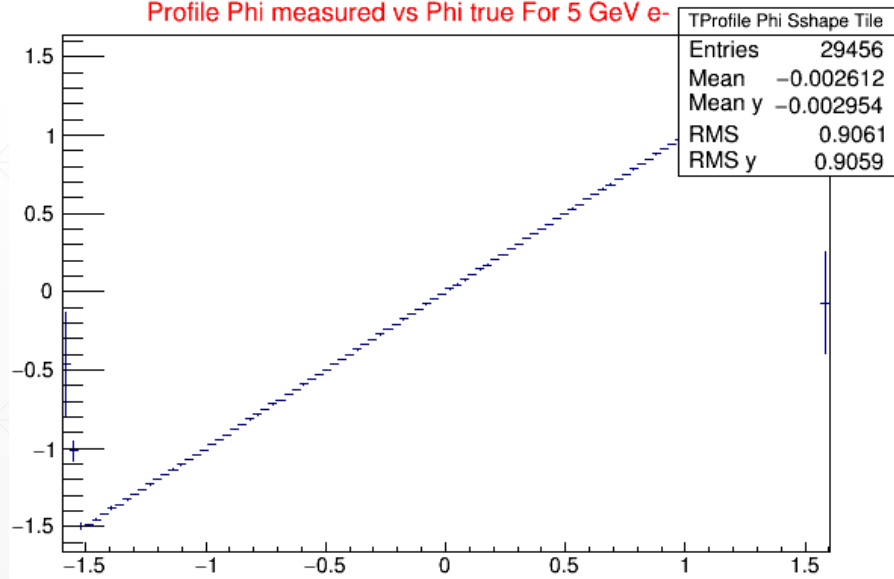
Phi measured vs Phi true For 5 GeV e-



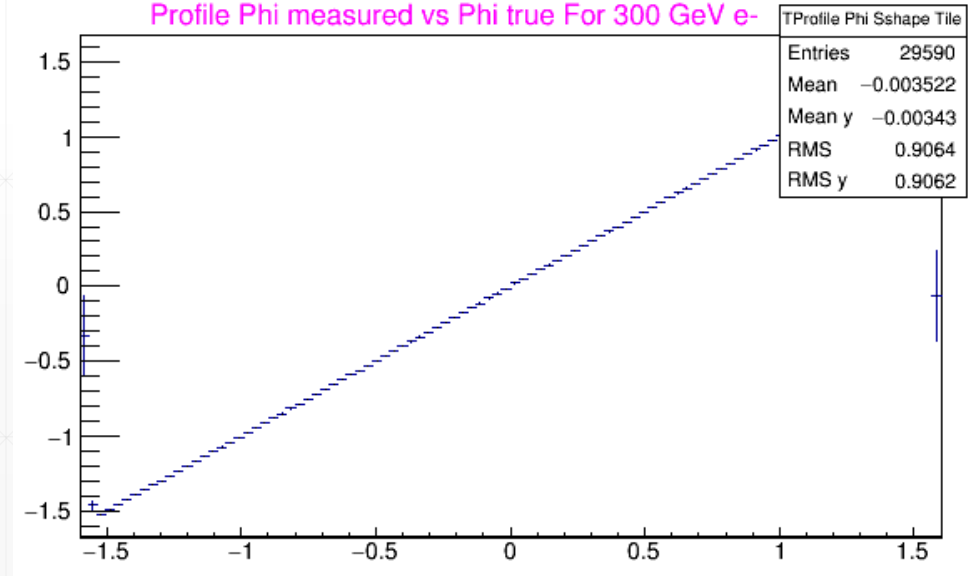
Phi measured vs Phi true for 300 GeV e-



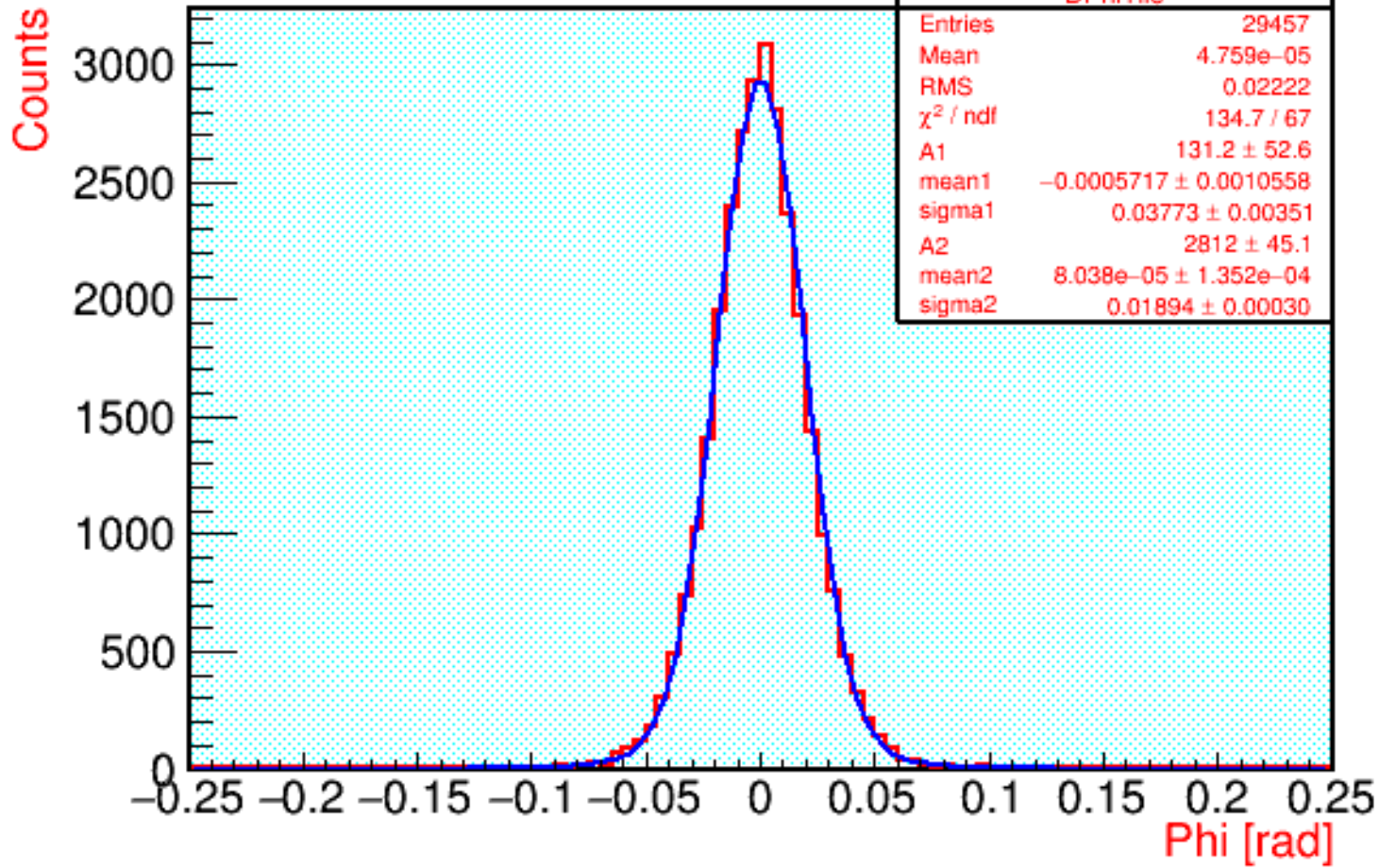
Profile Phi measured vs Phi true For 5 GeV e-



Profile Phi measured vs Phi true For 300 GeV e-



Tile Phi diff For 5 GeV e-



- *Difference in Phi between measured and true particle direction*

- *5 GeV e-*

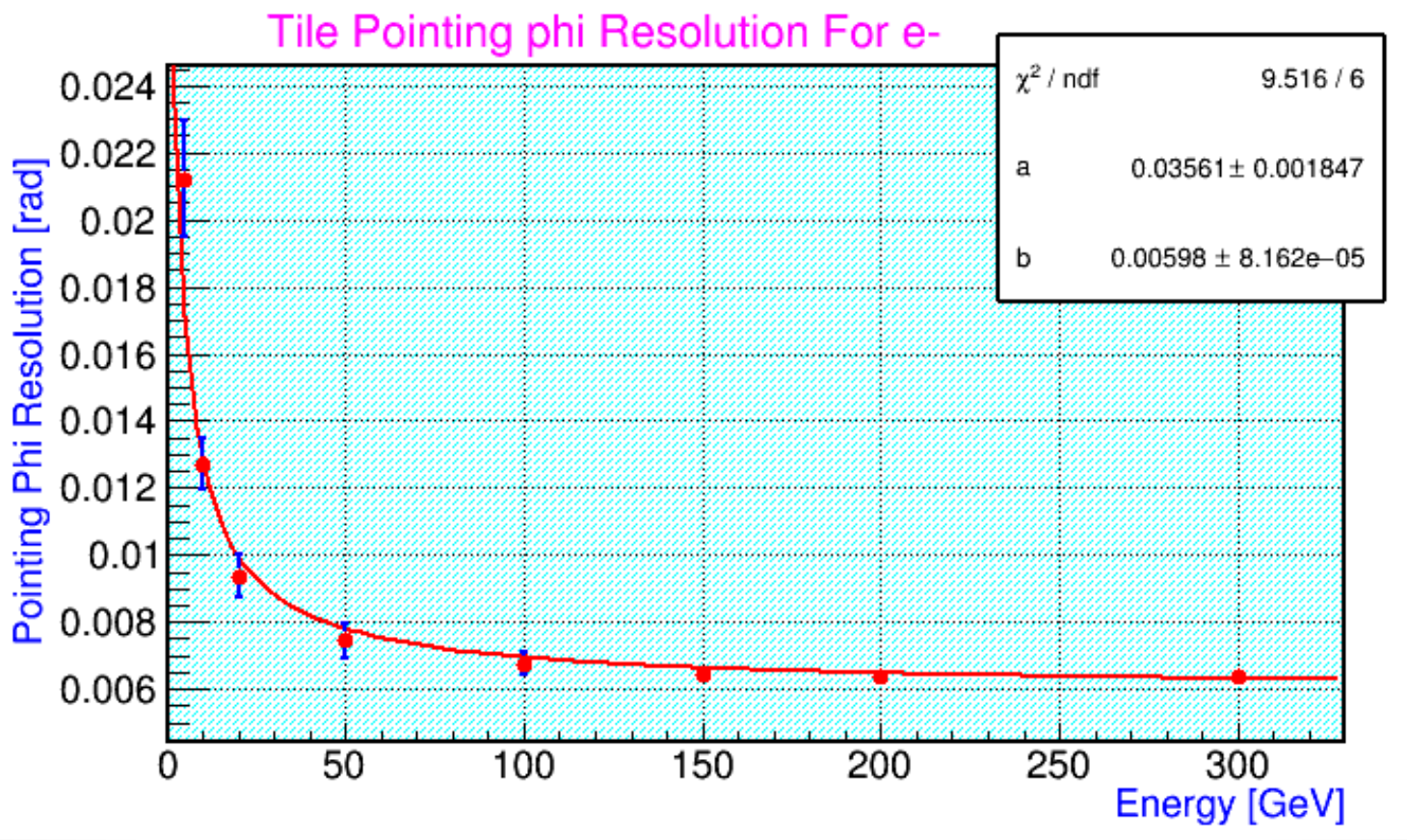
- *Fit with Double Gaussian:*

➤ *Pointing Phi Resolution*

$$\sigma_{\varphi} = 21.2001 \pm 1.74418 \text{ mrad}$$

- *Pointing φ Resolution vs Energy*
- *Fit with :*

$$\sigma_{\varphi} = \frac{a}{\sqrt{E}} \oplus b$$

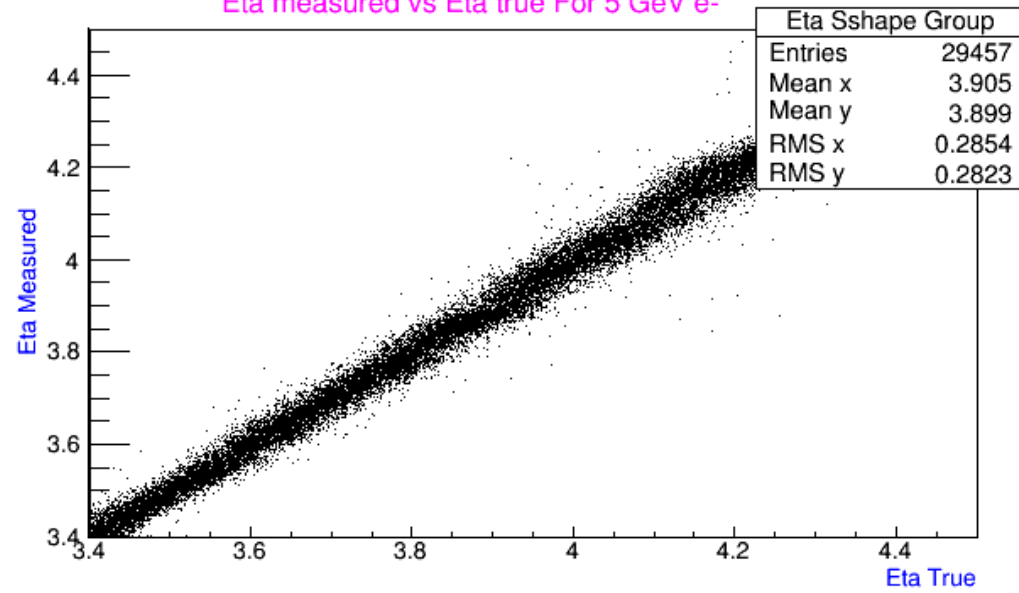


$$a = 35.61 \text{ mrad } \sqrt{\text{GeV}}$$

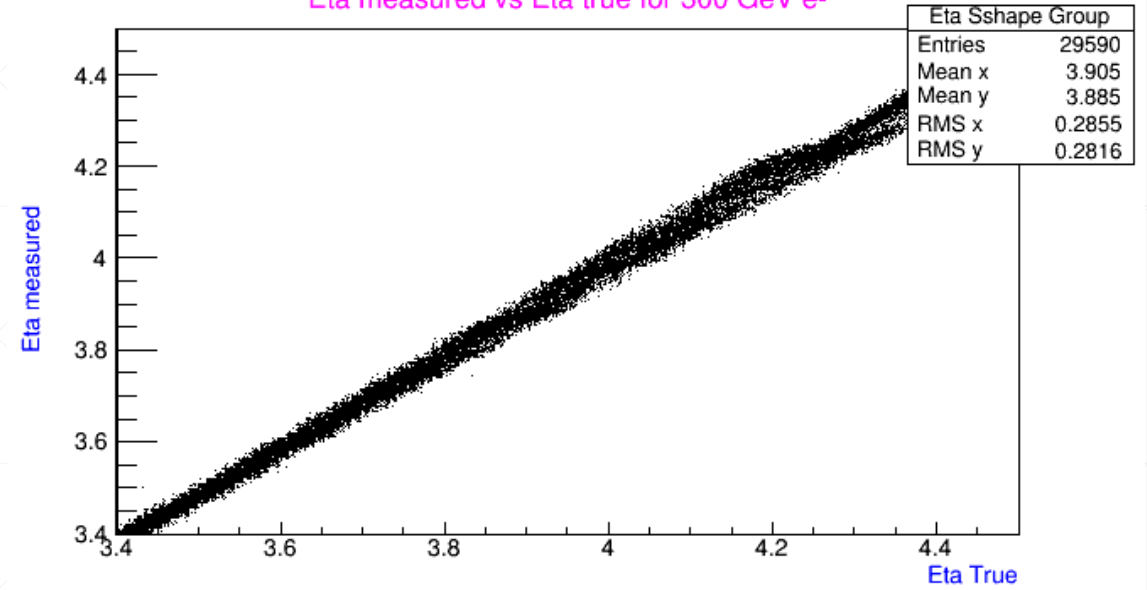
$$b = 5.98 \text{ mrad}$$

Eta Group S-Shape

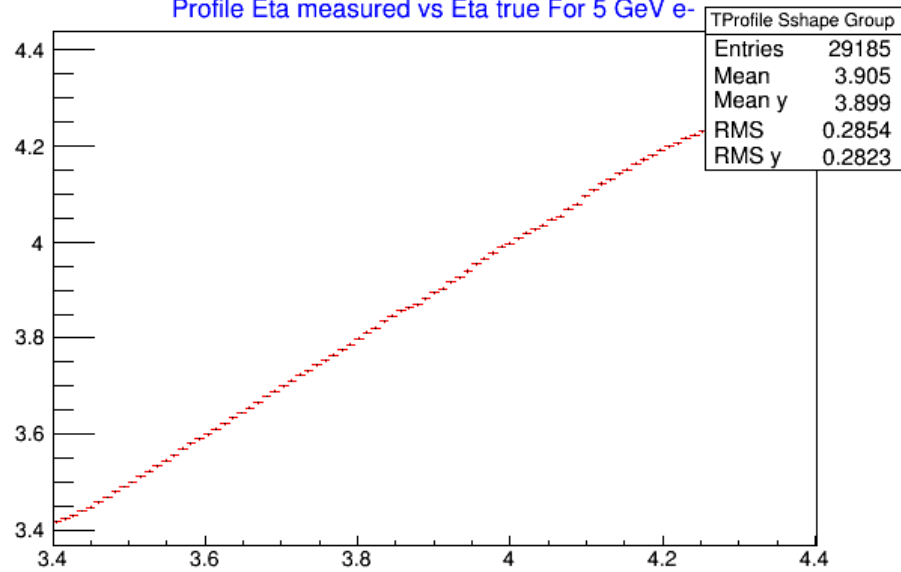
Eta measured vs Eta true For 5 GeV e-



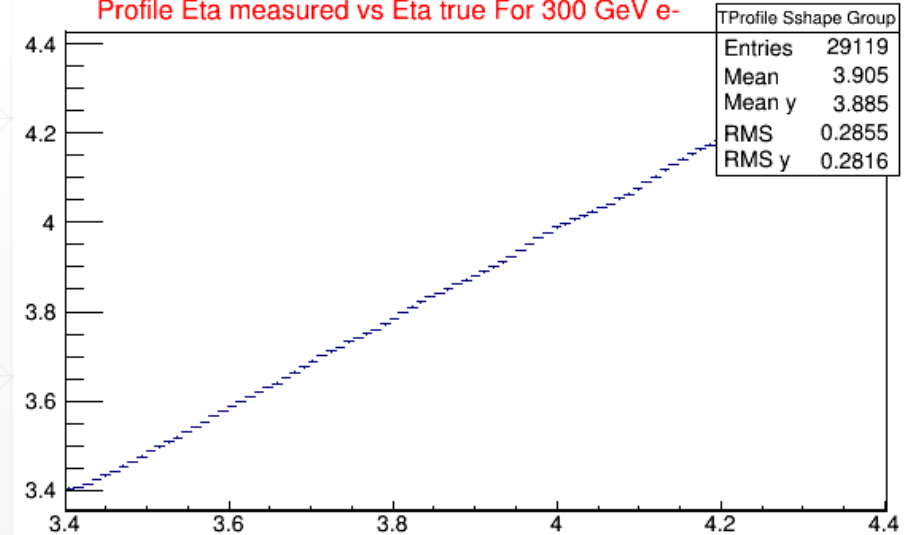
Eta measured vs Eta true for 300 GeV e-

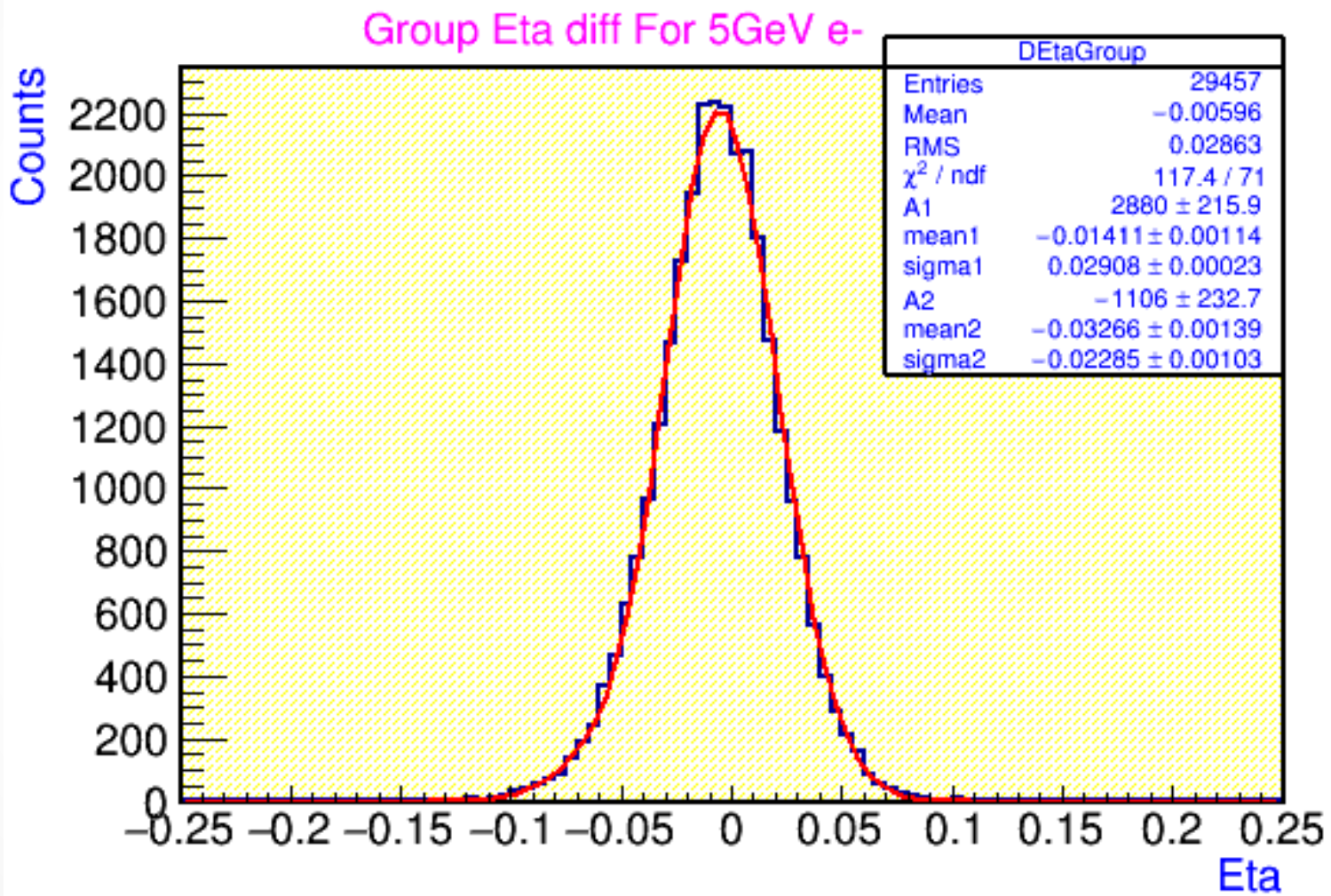


Profile Eta measured vs Eta true For 5 GeV e-



Profile Eta measured vs Eta true For 300 GeV e-





- *Difference in Eta between measured and true particle direction*

- *5 GeV e-*

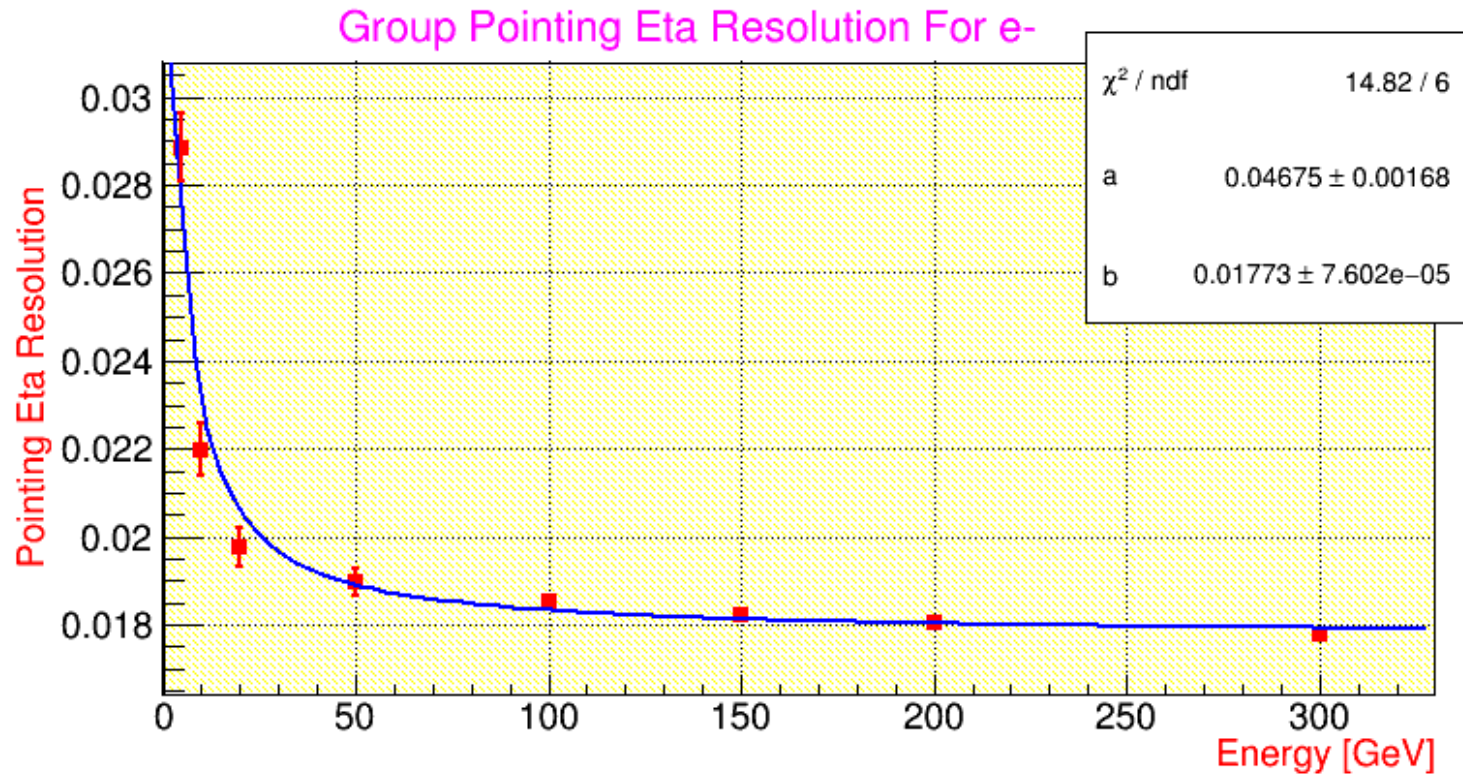
- *Fit with Double Gaussian:*

➤ *Pointing Eta Resolution*

$$\sigma_{\eta} = 0.0288424 \pm 0.000763611$$

- *Pointing η Resolution vs Energy*
- *Fit with :*

$$\sigma_{\eta} = \frac{a}{\sqrt{E}} \oplus b$$

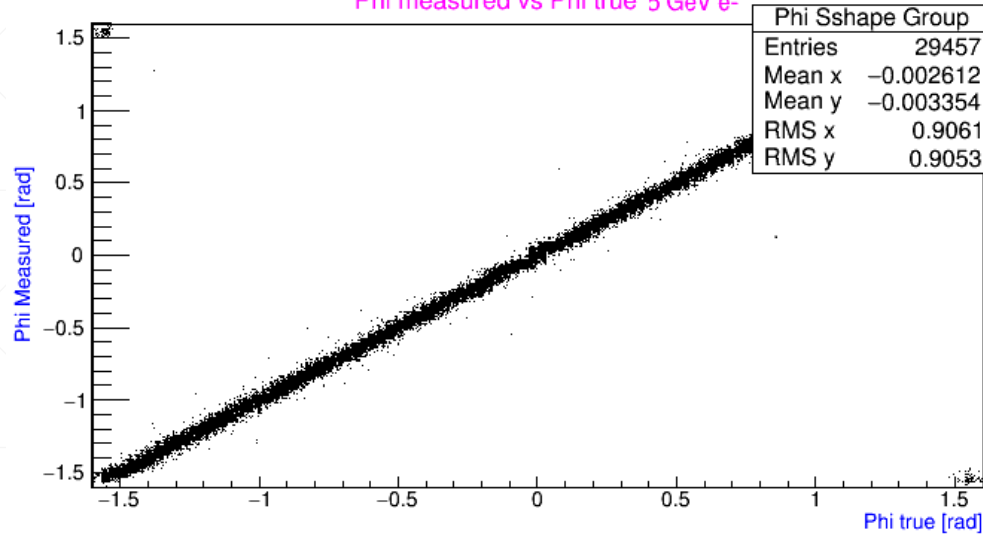


$$a = 0.04675\sqrt{GeV}$$

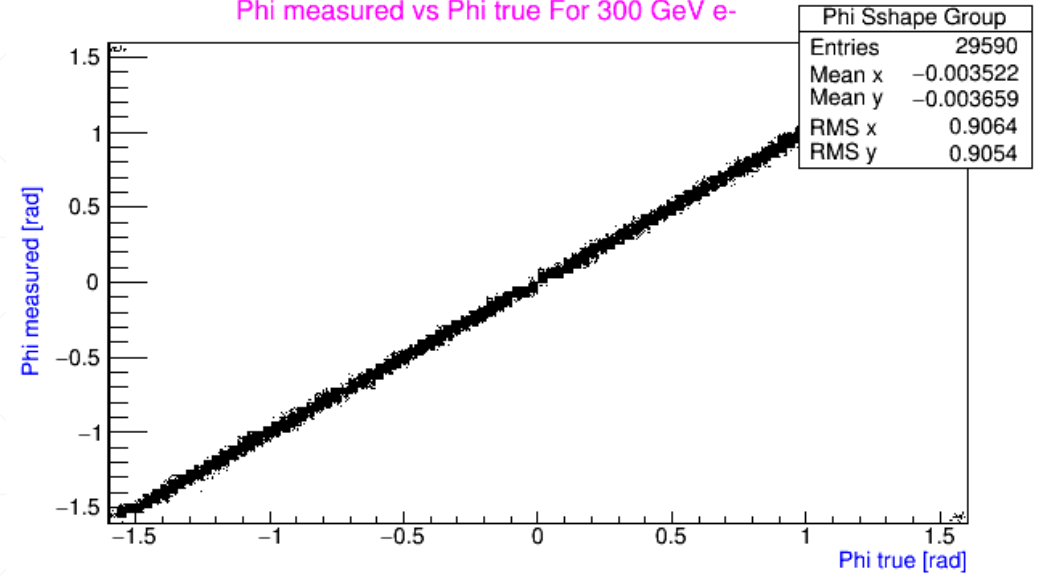
$$b = 0.01773$$

Phi Group S-Shape

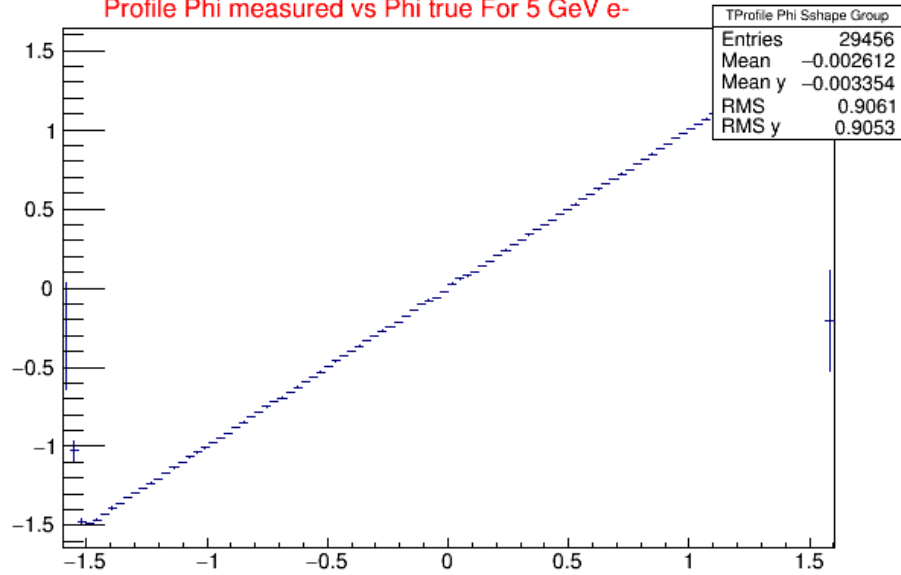
Phi measured vs Phi true 5 GeV e-



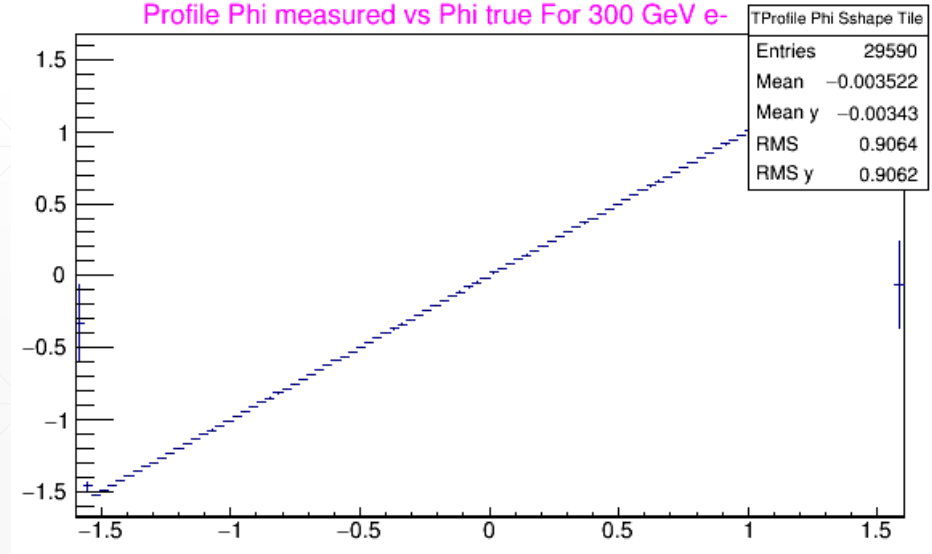
Phi measured vs Phi true For 300 GeV e-



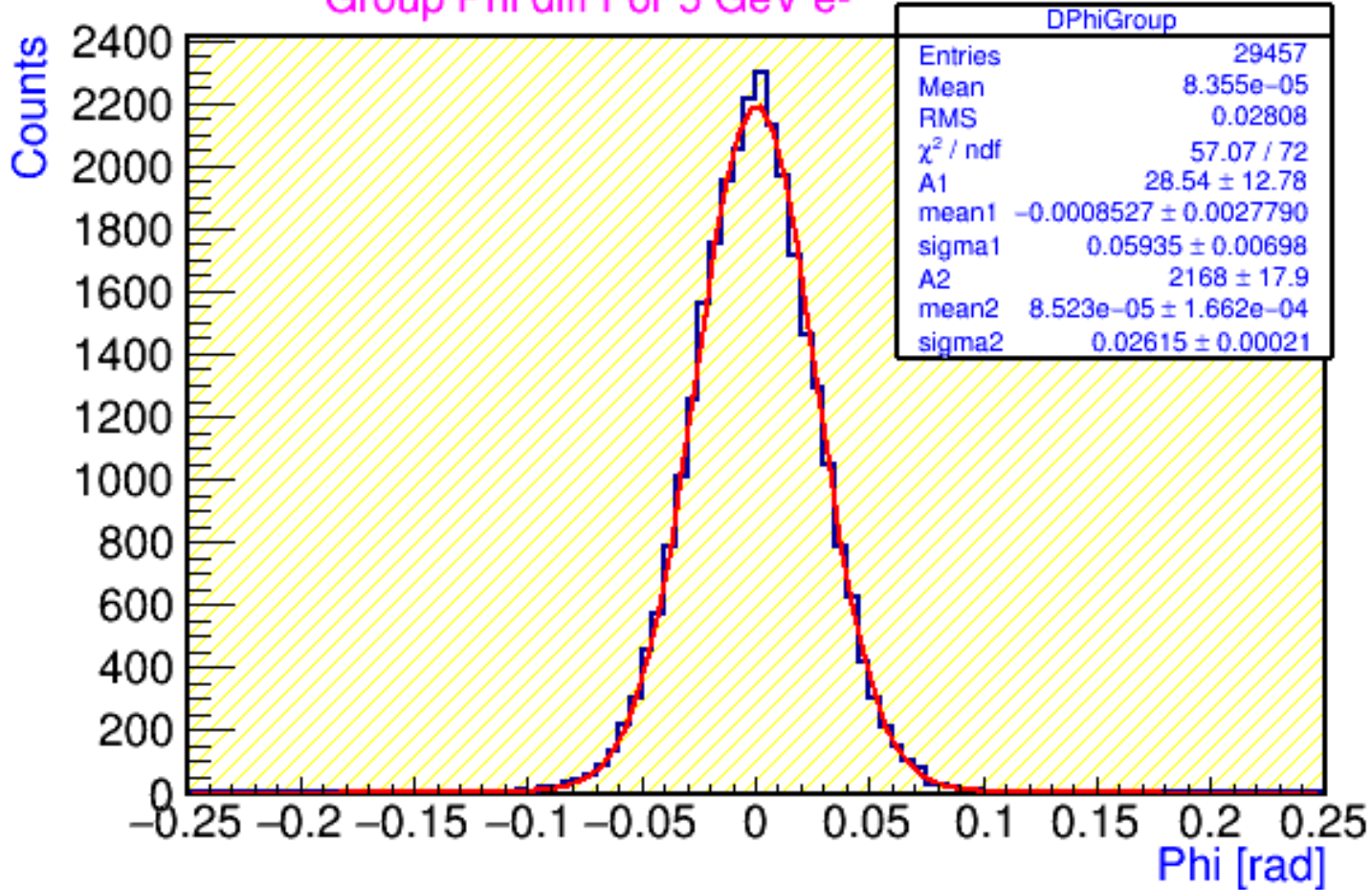
Profile Phi measured vs Phi true For 5 GeV e-



Profile Phi measured vs Phi true For 300 GeV e-



Group Phi diff For 5 GeV e-



- *Difference in Phi between measured and true particle direction*

- *5 GeV e-*

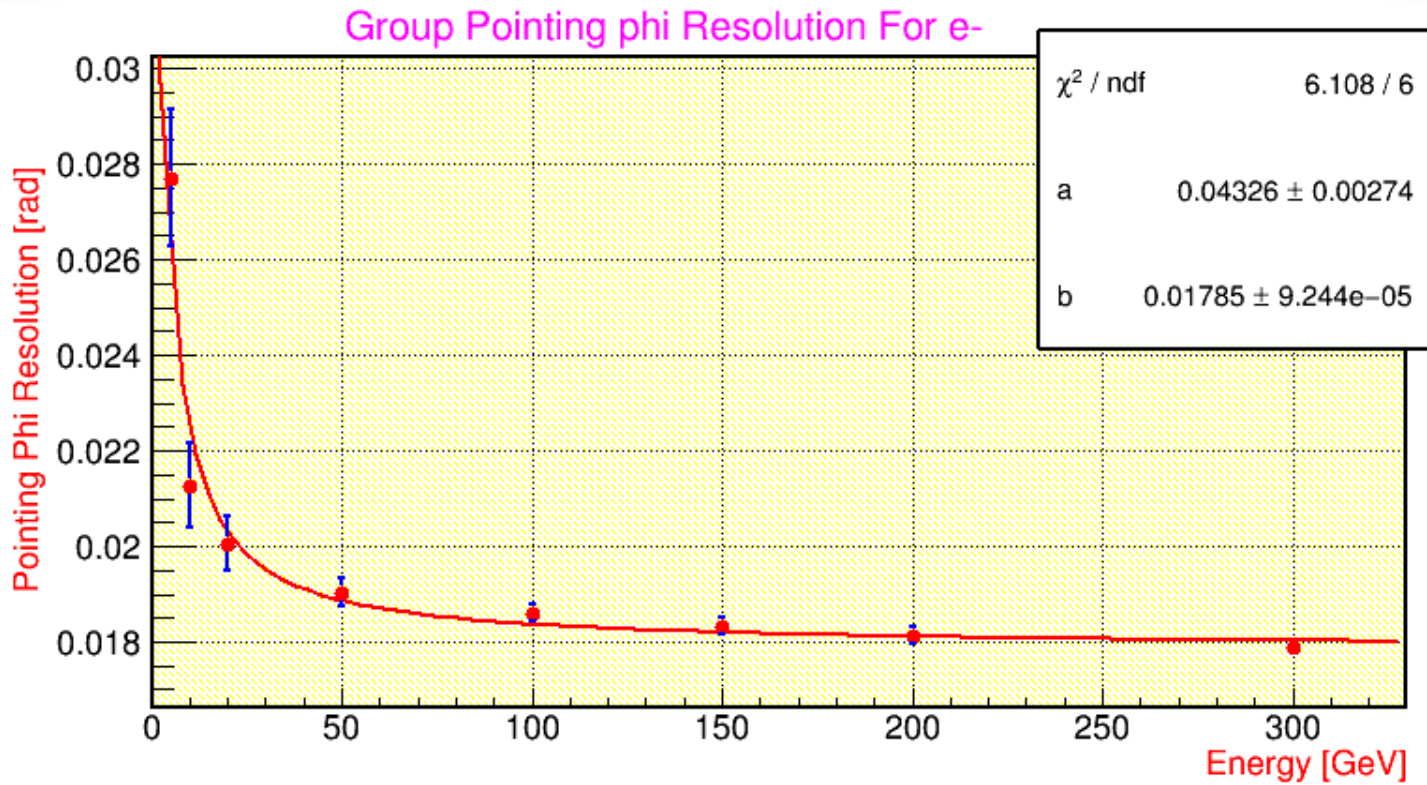
- *Fit with Double Gaussian:*

➤ *Pointing Phi Resolution*

$$\sigma_{\varphi} = 27.6764 \pm 1.45156 \text{ mrad}$$

- *Pointing φ Resolution vs Energy*
- *Fit with :*

$$\sigma_{\varphi} = \frac{a}{\sqrt{E}} \oplus b$$

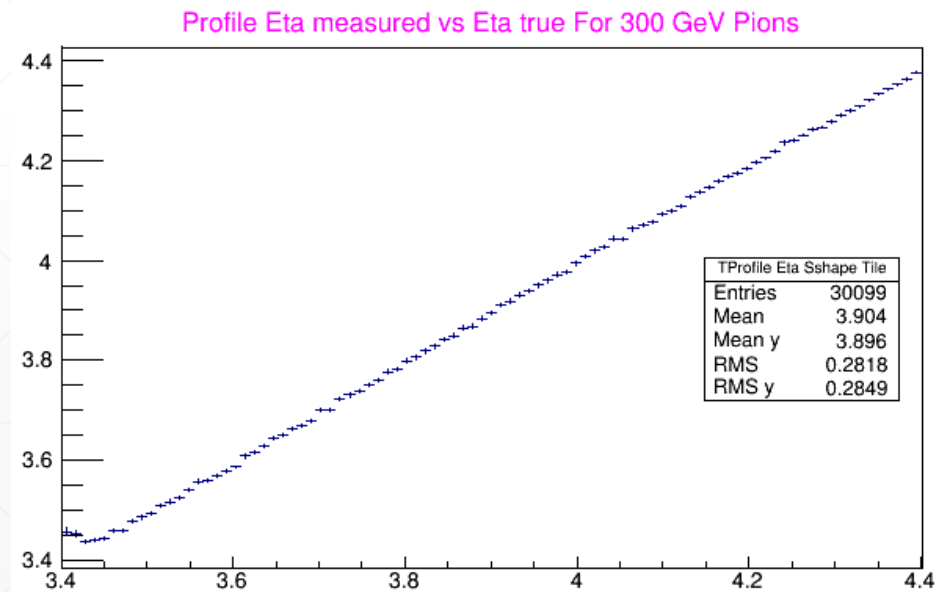
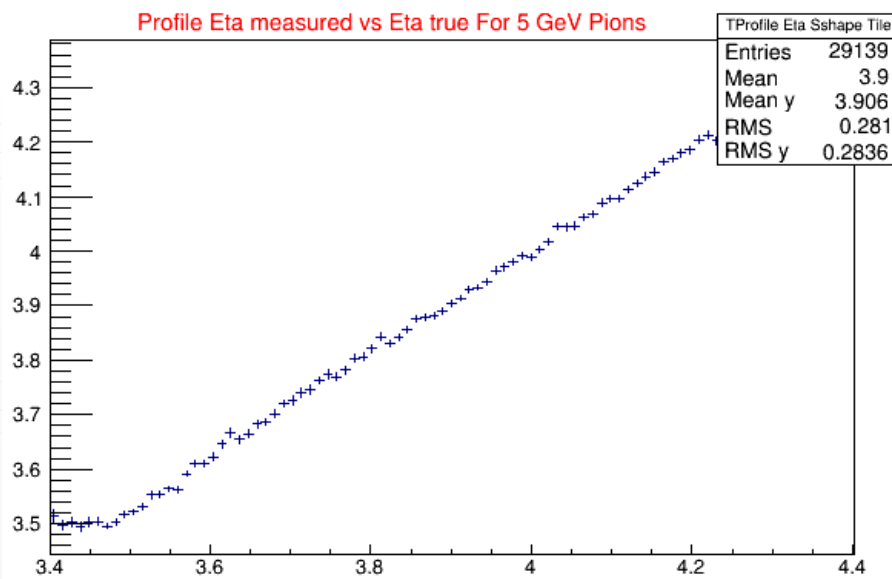
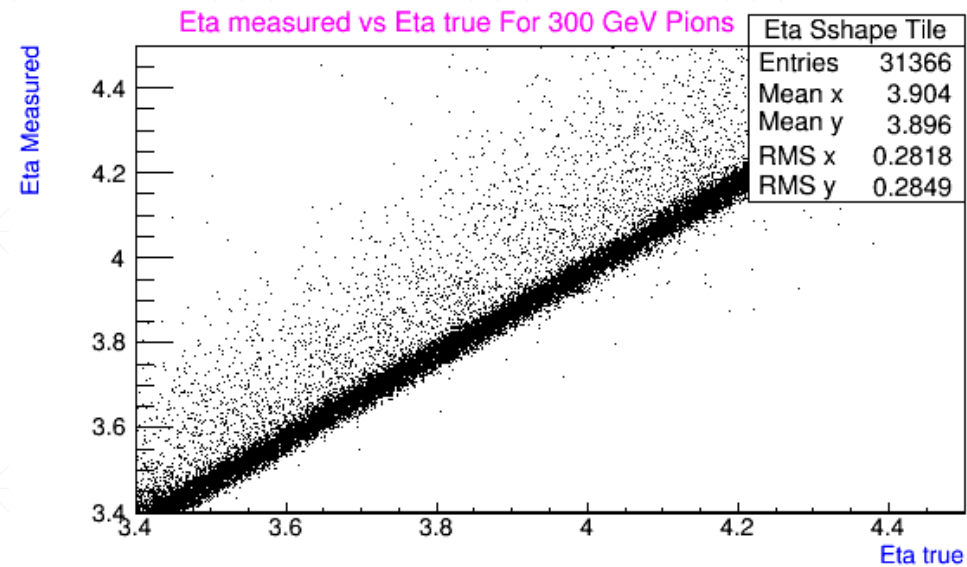
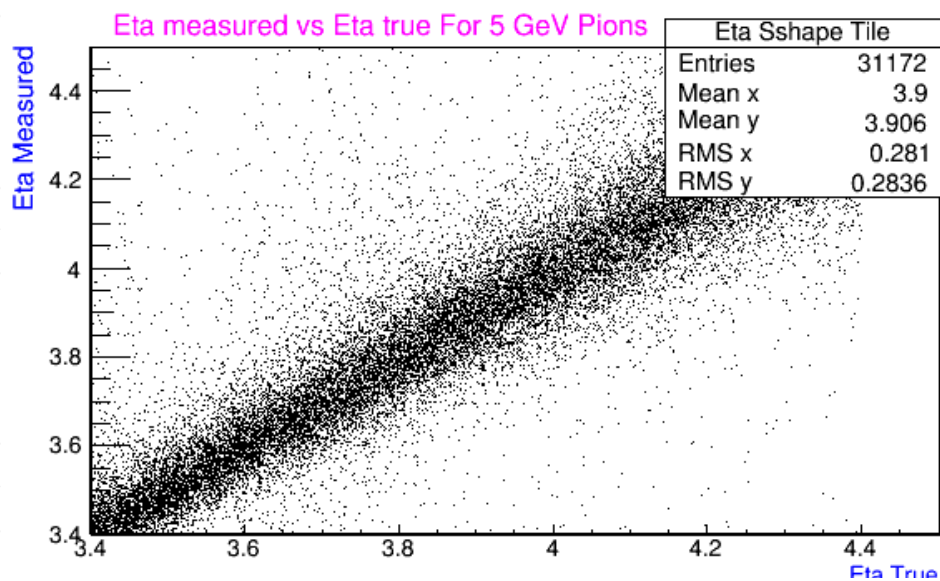


$$a = 43.26 \text{ mrad } \sqrt{\text{GeV}}$$

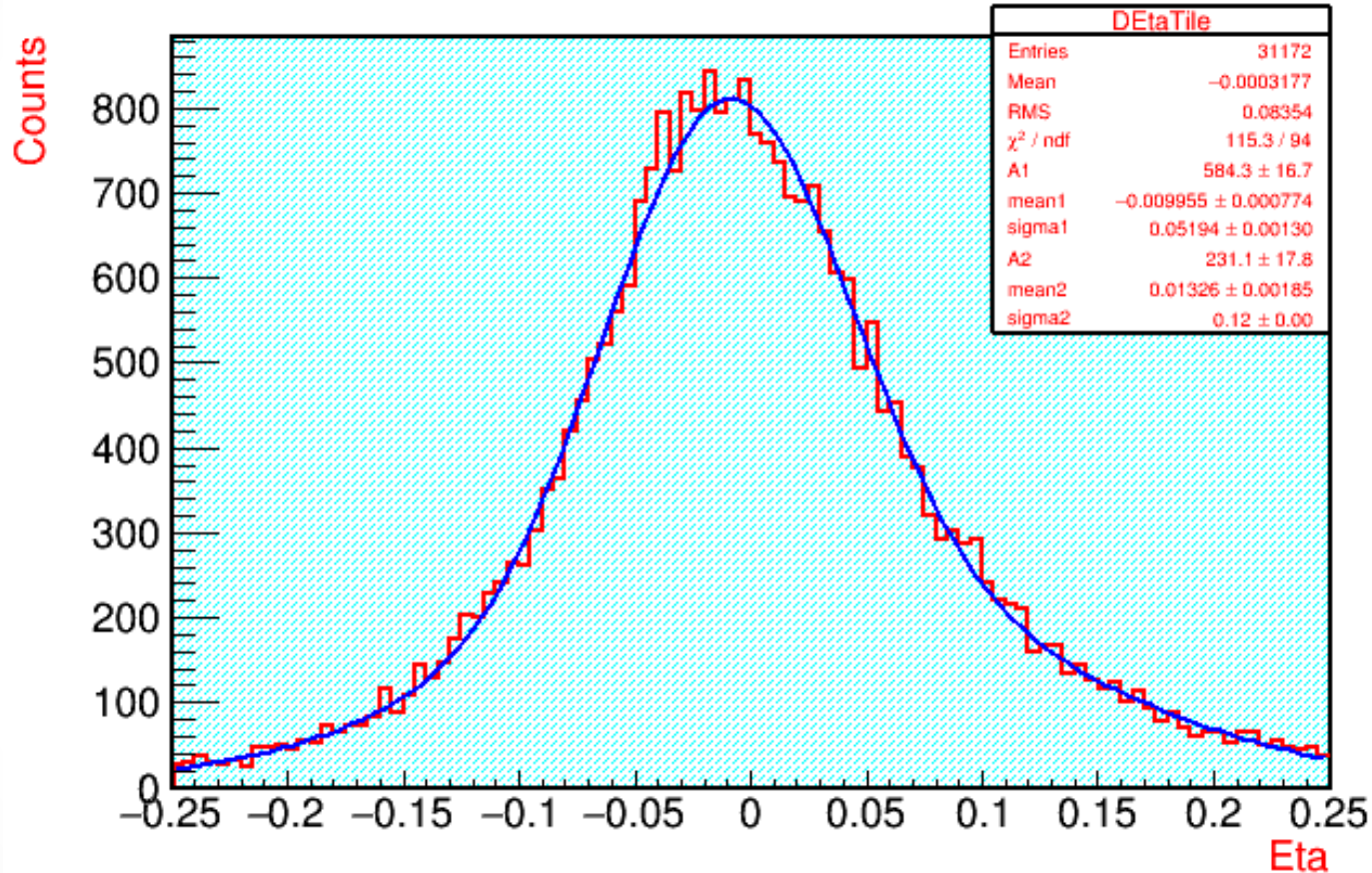
$$b = 17.85 \text{ mrad}$$

Pions Data Analysis

Eta Tile S-Shape



Tile Eta diff For 5 GeV Pions



- *Difference in Eta between measured and true particle direction*

- *5 GeV Pions*

- *Fit with Double Gaussian:*

➤ *Pointing Eta Resolution*

$$\sigma_{\eta} = 0.0917581 \pm 0.00447707$$

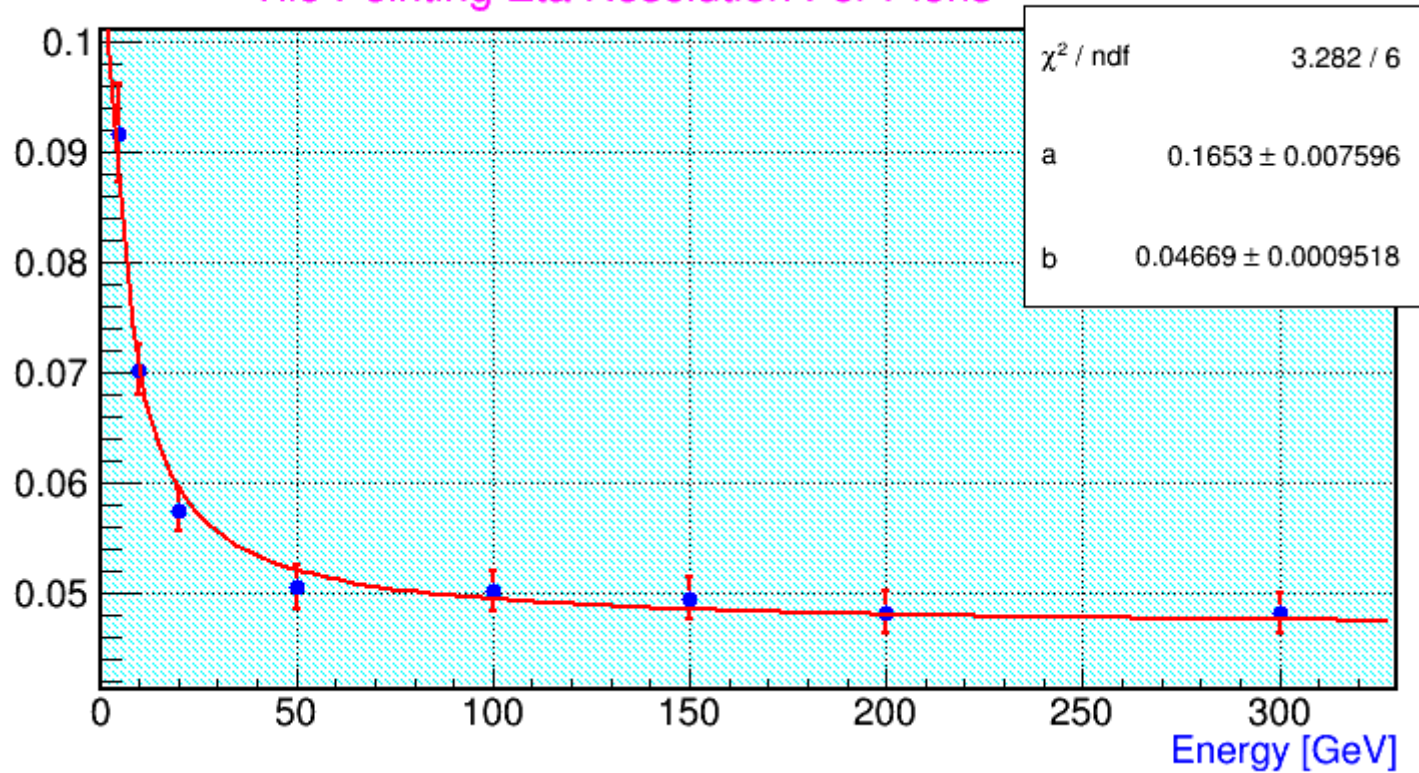
- *Pointing η Resolution vs Energy*
- *Fit with :*

$$\sigma_{\eta} = \frac{a}{\sqrt{E}} \oplus b$$

$$a = 0.1653 \sqrt{\text{GeV}}$$

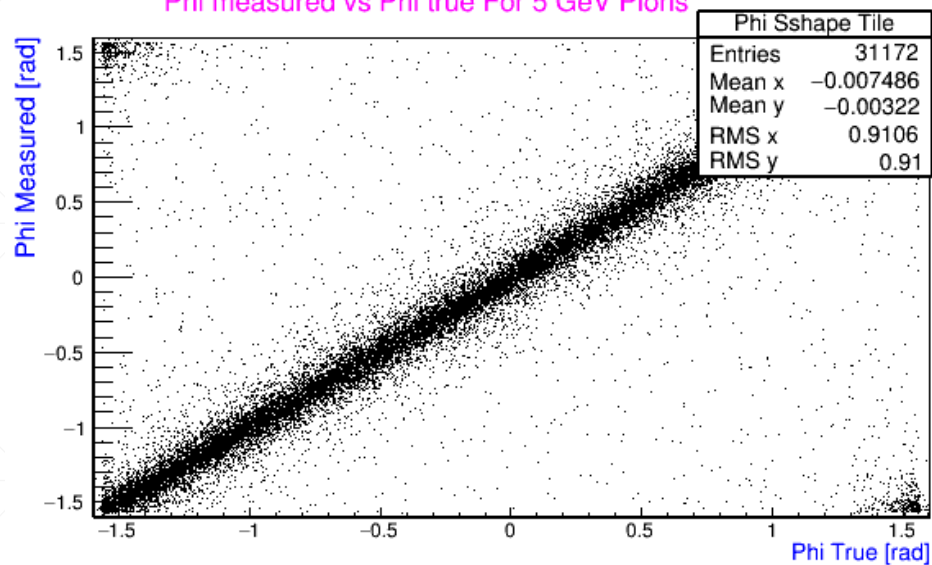
$$b = 0.04669$$

Tile Pointing Eta Resolution For Pions

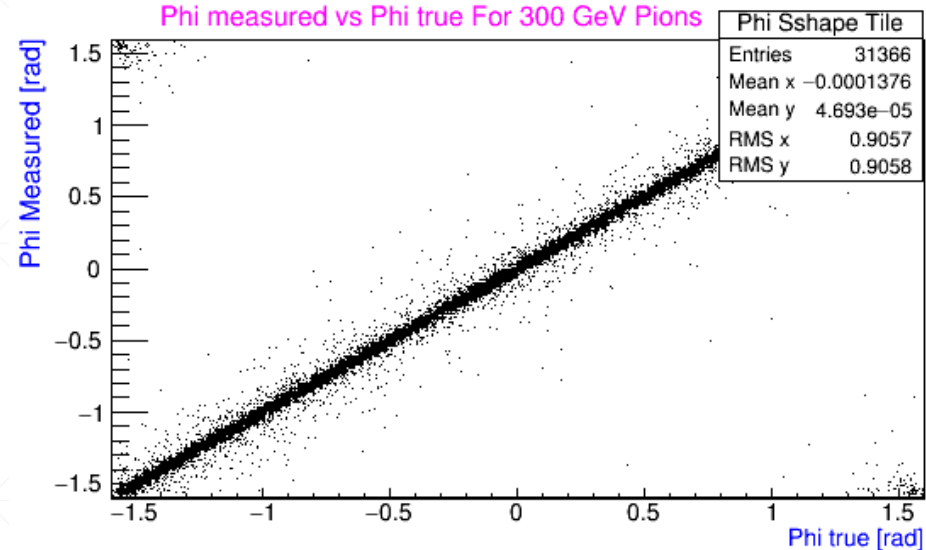


Phi Tile S-Shape

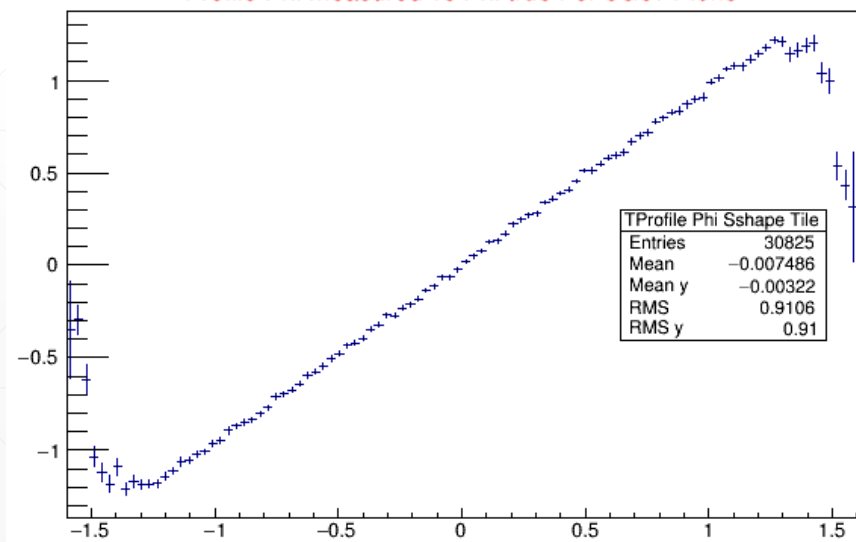
Phi measured vs Phi true For 5 GeV Pions



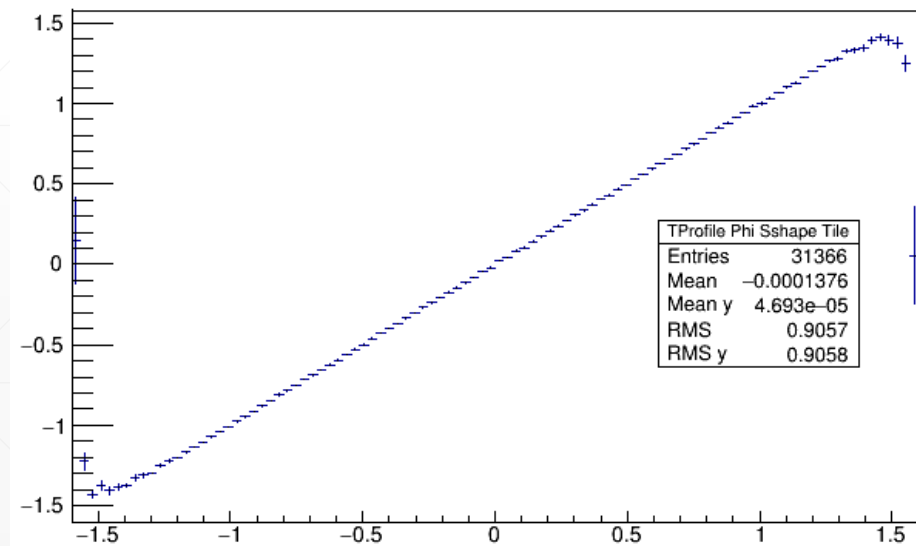
Phi measured vs Phi true For 300 GeV Pions



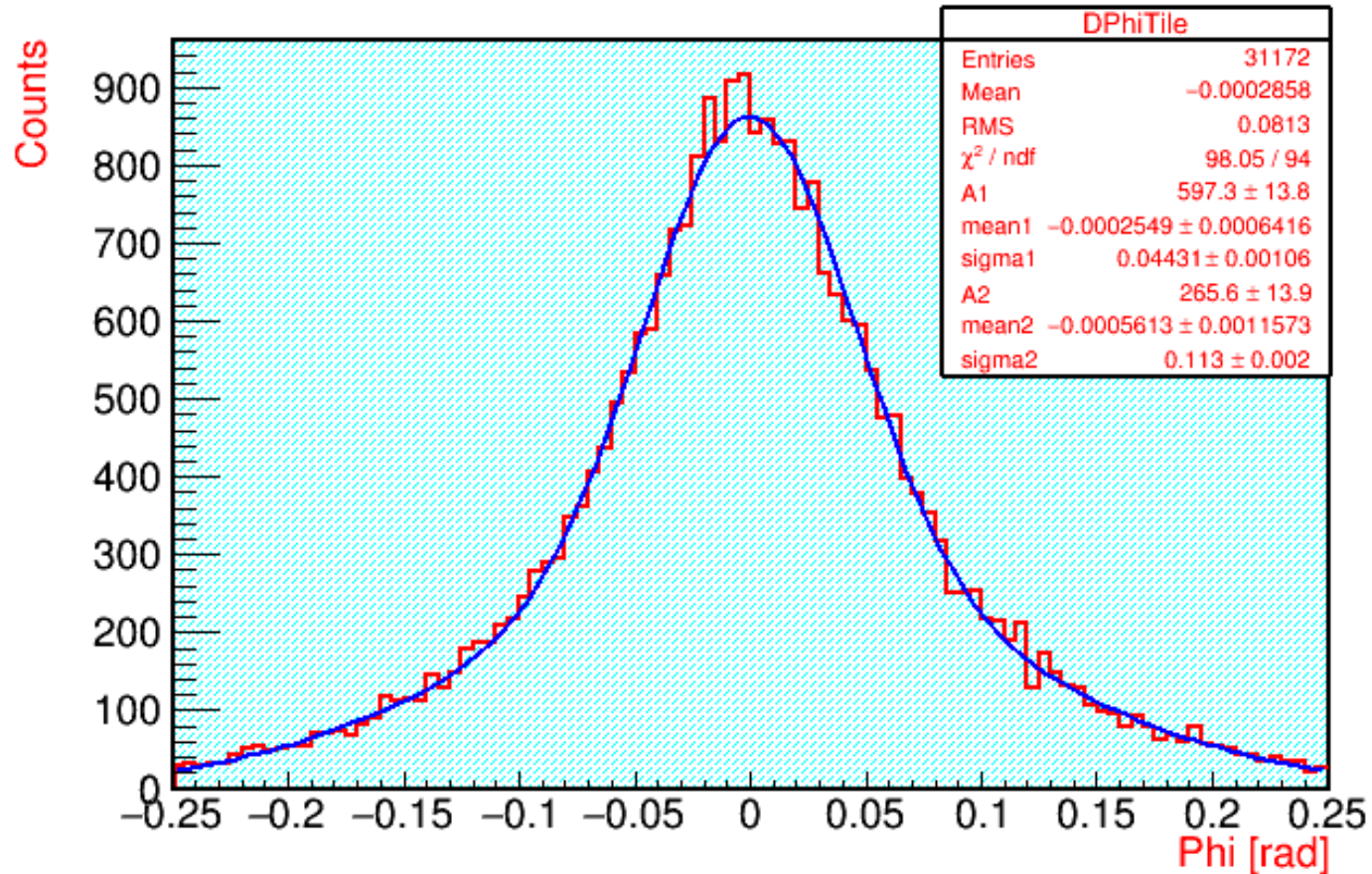
Profile Phi measured vs Phi true For 5Gev Pions



Profile Phi measured vs Phi true For 300 GeV Pions



Tile Phi diff For 5 GeV Pions



- *Difference in Phi between measured and true particle direction*

- *5 GeV Pions*

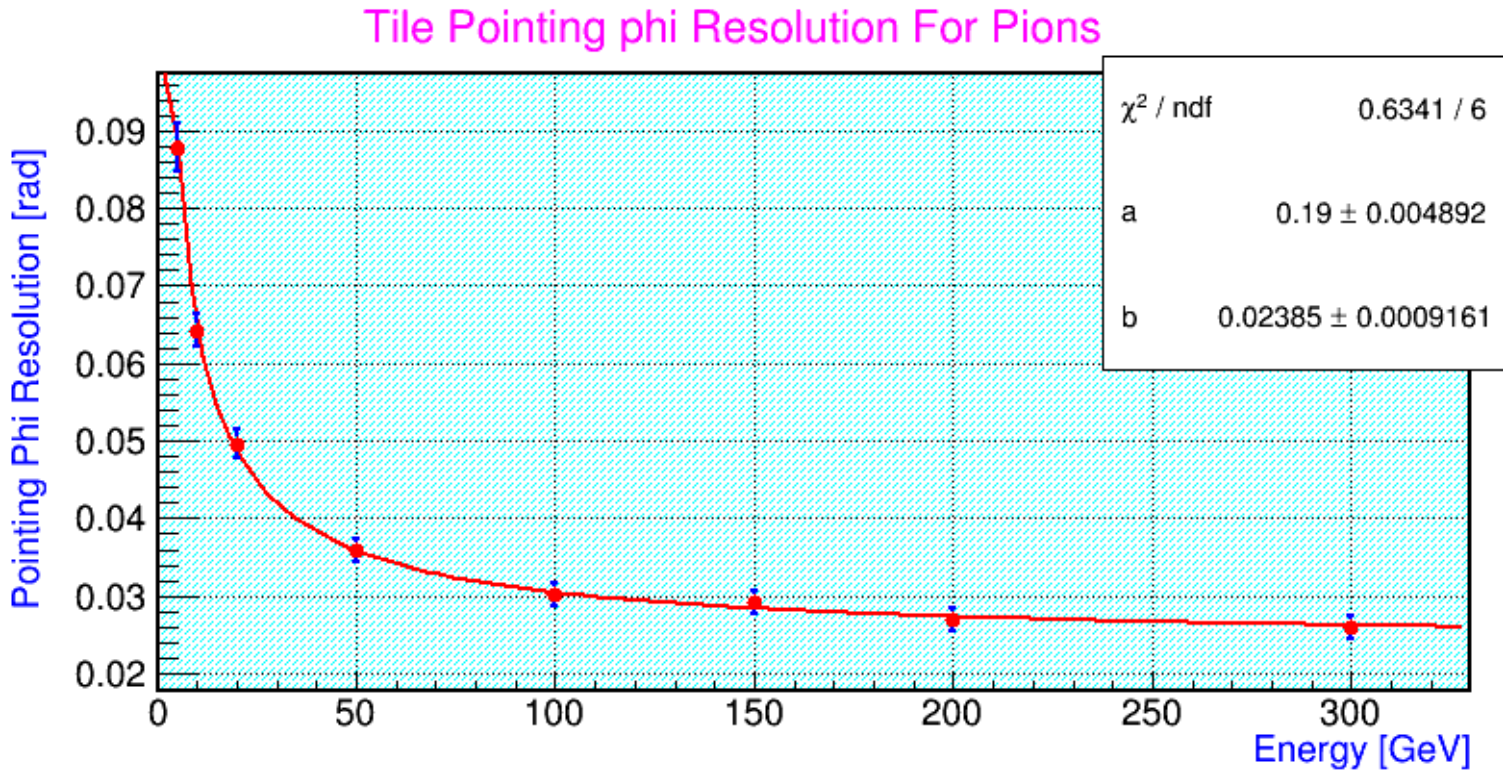
- *Fit with Double Gaussian:*

➤ *Pointing Phi Resolution*

$$\sigma_{\varphi} = 87.7492 \pm 3.13529 \text{ mrad}$$

- *Pointing φ Resolution vs Energy*
- *Fit with :*

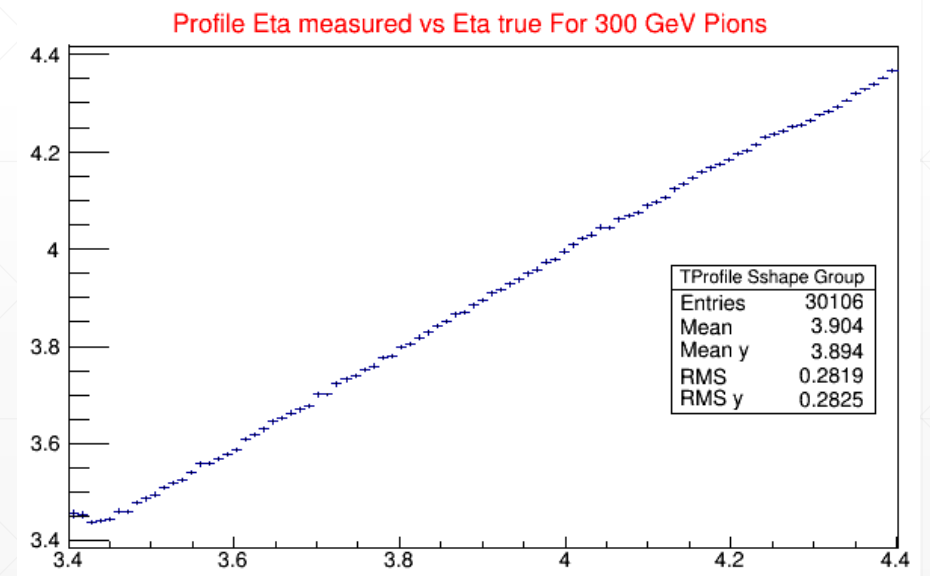
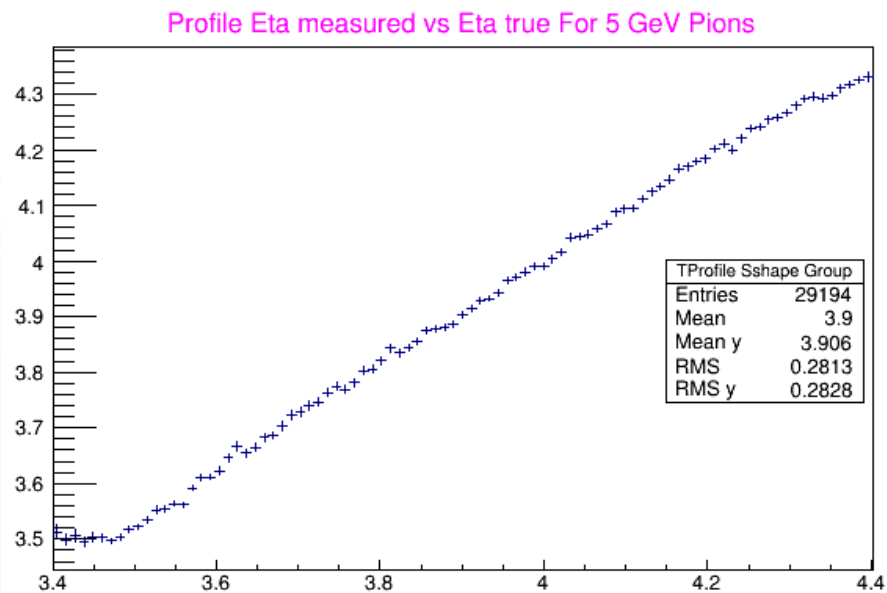
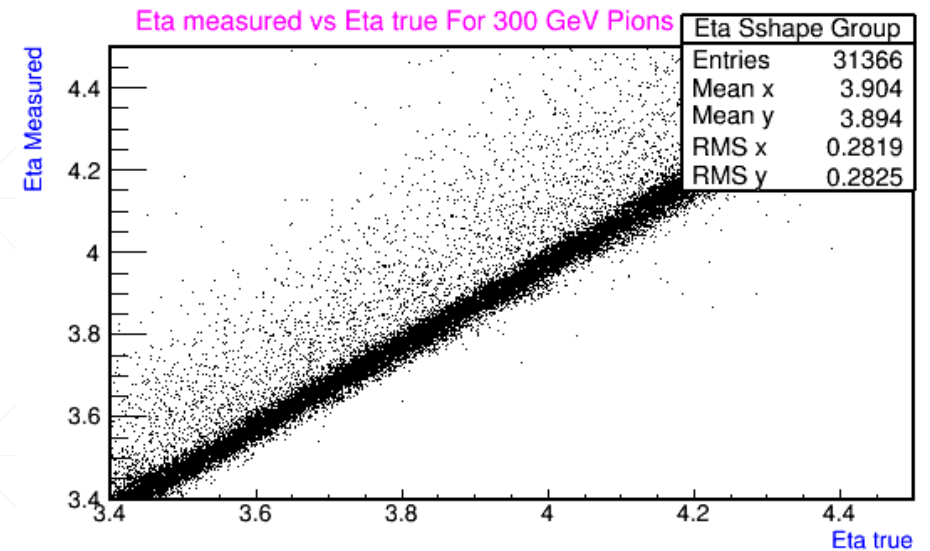
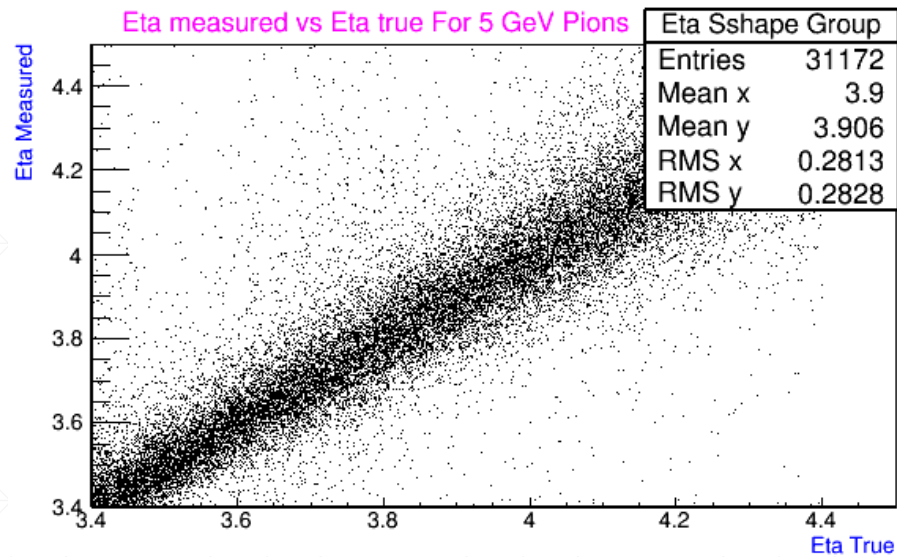
$$\sigma_{\varphi} = \frac{a}{\sqrt{E}} \oplus b$$

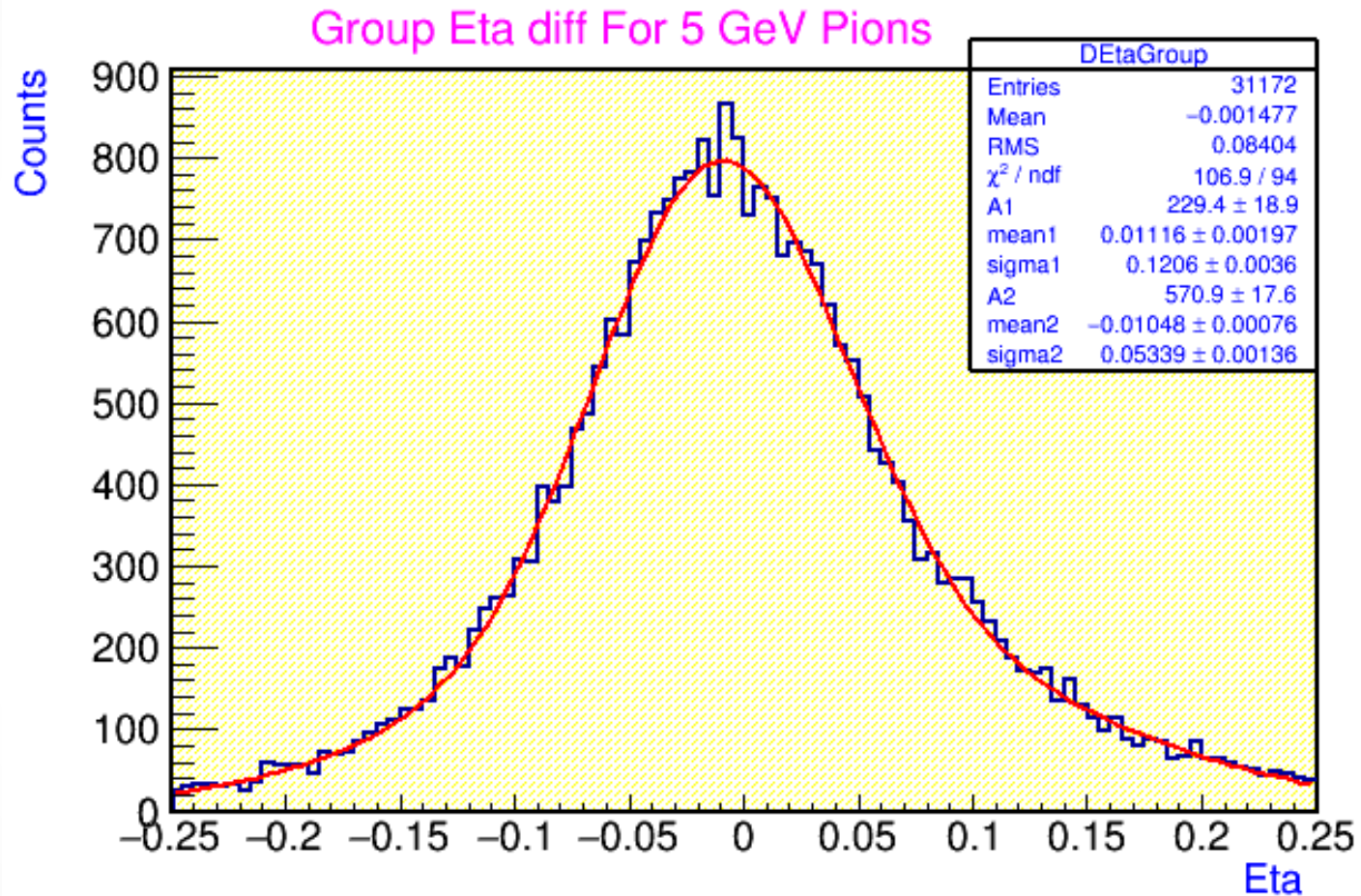


$$a = 0.19 \text{ rad } \sqrt{\text{GeV}}$$

$$b = 0.02385 \text{ rad}$$

Eta Group S-Shape





- *Difference in Eta between measured and true particle direction*

- *5 GeV pions*

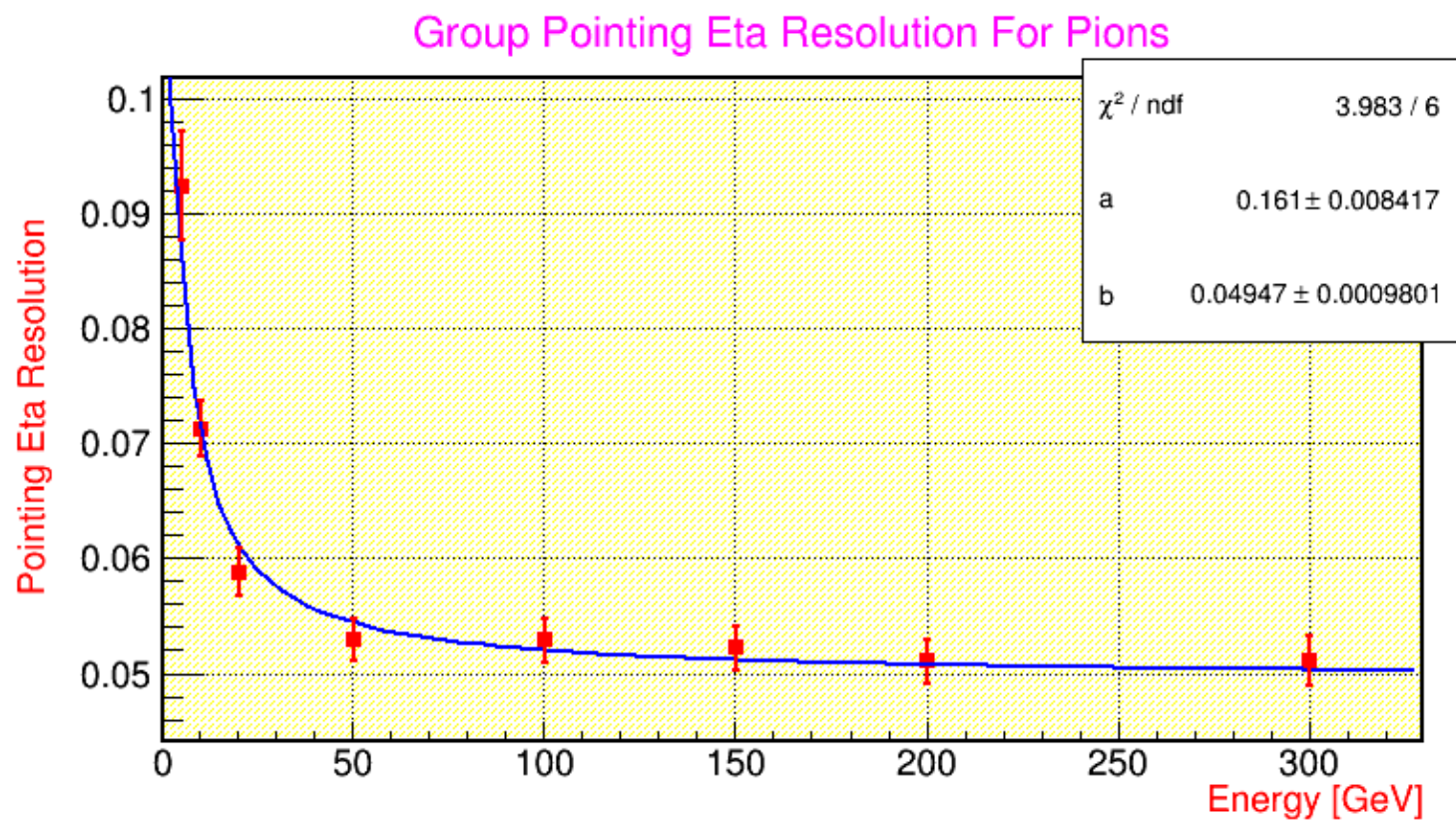
- *Fit with Double Gaussian:*

➤ *Pointing Eta Resolution*

$$\sigma_{\eta} = 0.0923347 \pm 0.00469104$$

- *Pointing η Resolution vs Energy*
- *Fit with :*

$$\sigma_{\eta} = \frac{a}{\sqrt{E}} \oplus b$$

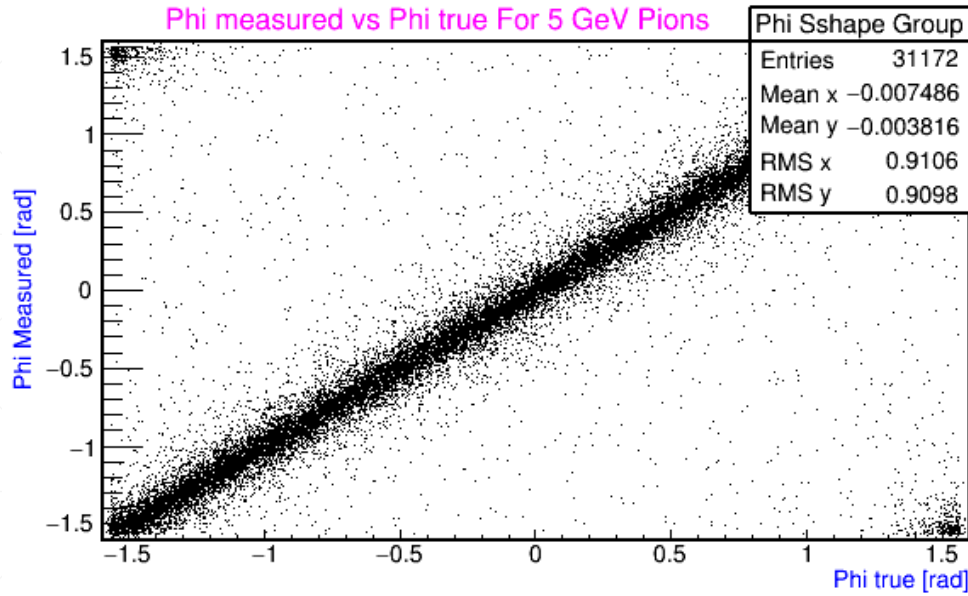


$$a = 0.161\sqrt{\text{GeV}}$$

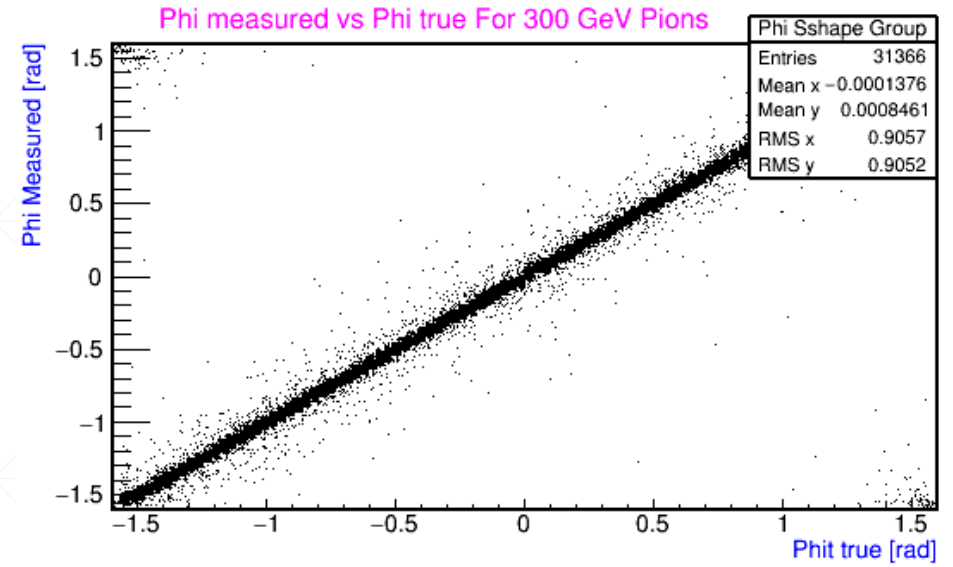
$$b = 0.04947$$

Phi Group S-Shape

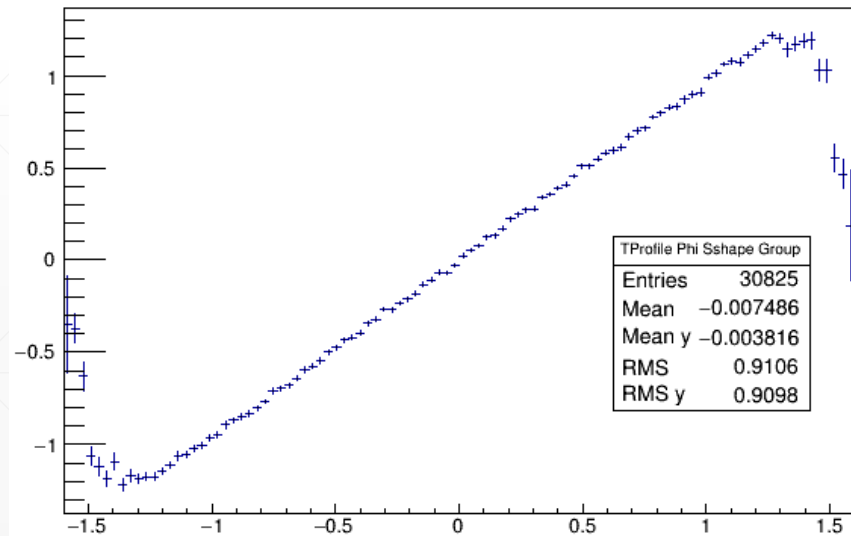
Phi measured vs Phi true For 5 GeV Pions



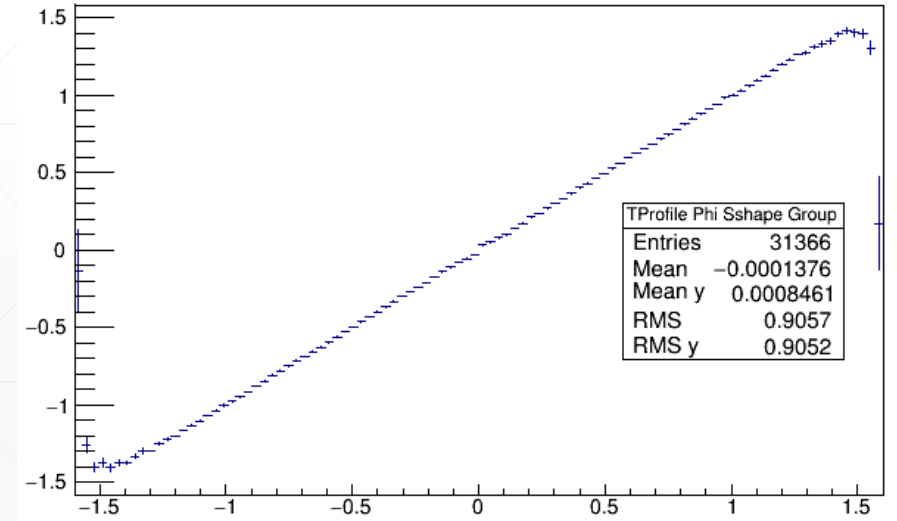
Phi measured vs Phi true For 300 GeV Pions



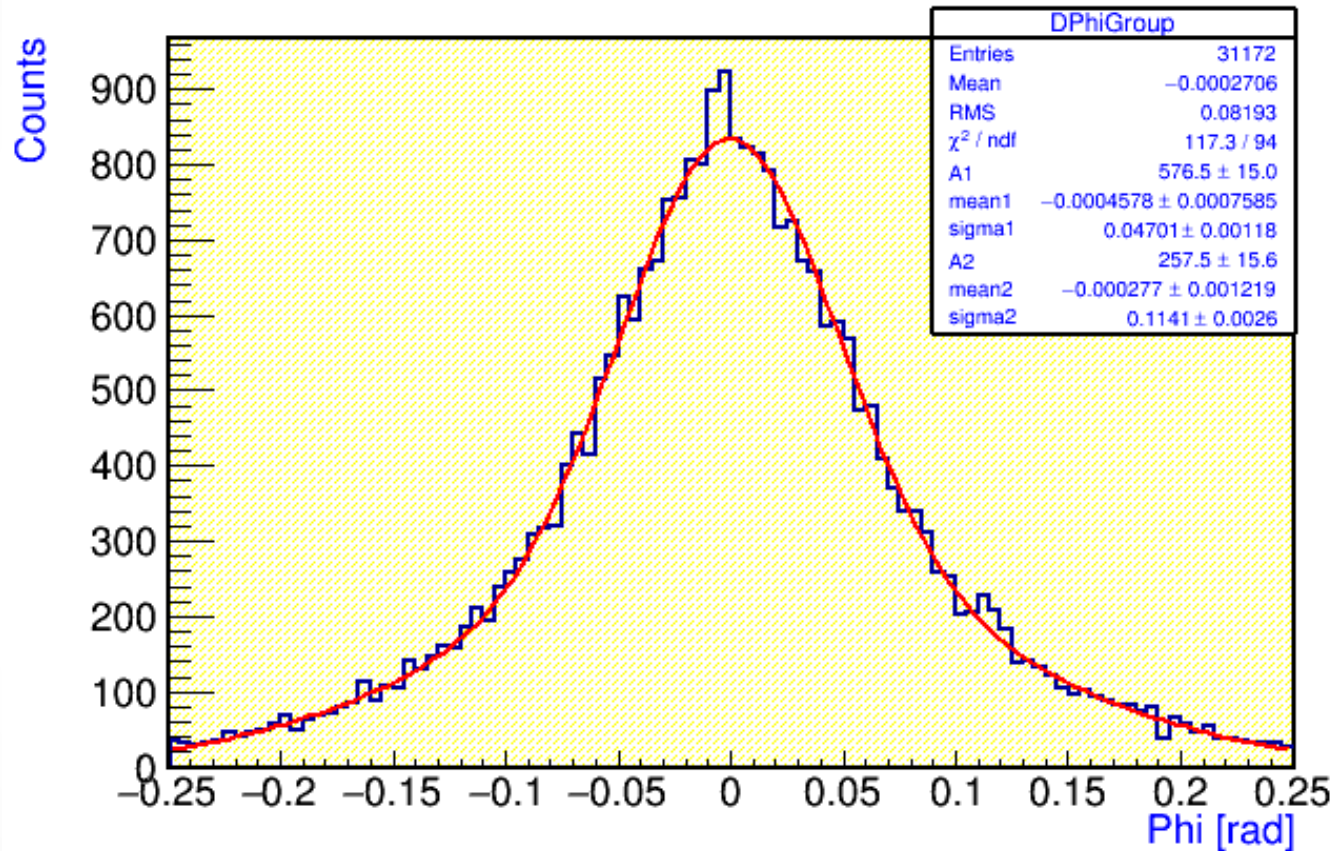
Profile Phi measured vs Phi true For 5 GeV Pions



Profile Phi measured vs Phi true For 300 GeV Pions



Group Phi diff For 5 GeV Pions



- *Difference in Phi between measured and true particle direction*

- *5 GeV Pions*

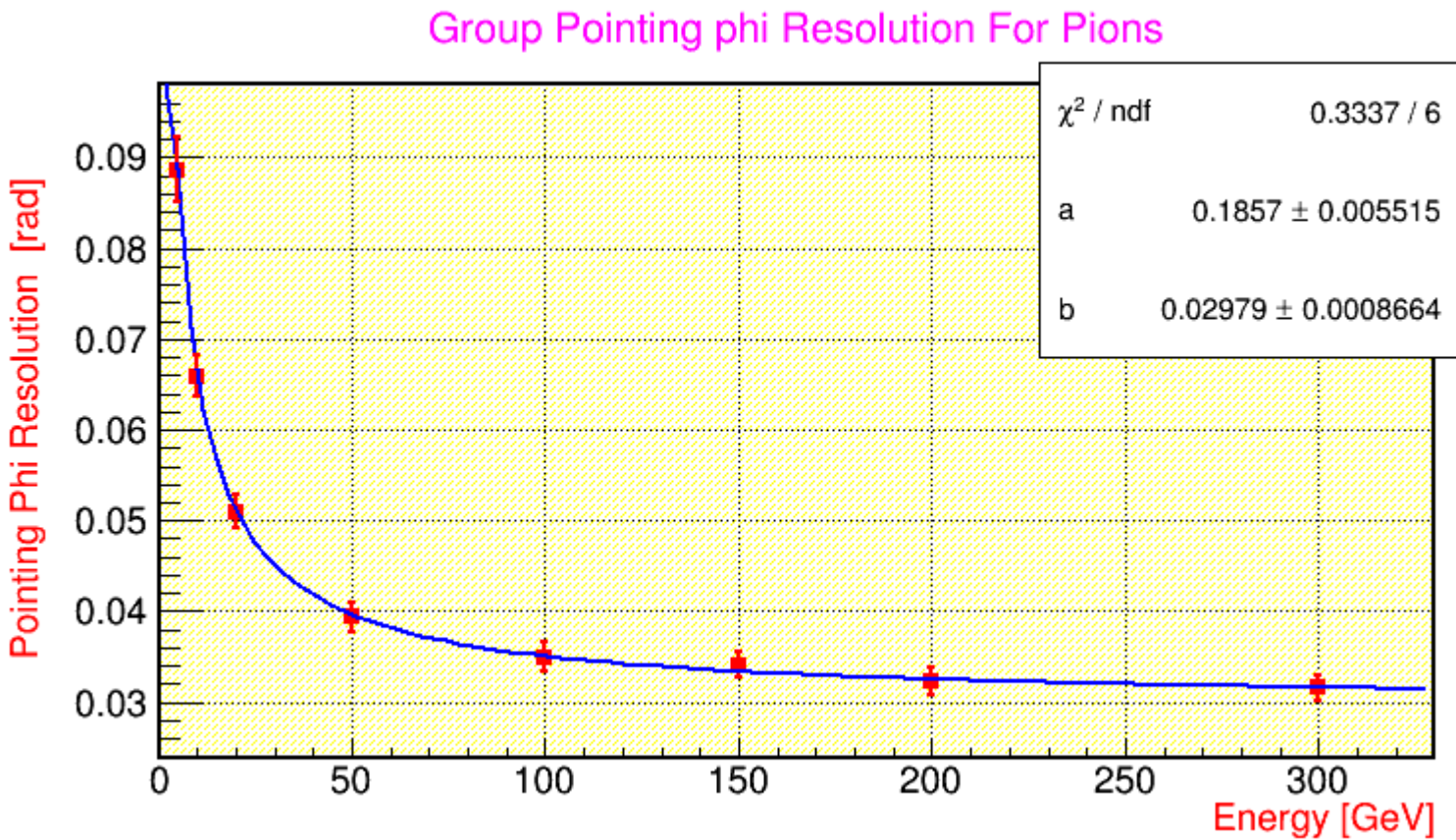
- *Fit with Double Gaussian:*

➤ *Pointing Phi Resolution*

$$\sigma_{\varphi} = 88.5207 \pm 3.48051 \text{ mrad}$$

- *Pointing φ Resolution vs Energy*
- *Fit with :*

$$\sigma_{\varphi} = \frac{a}{\sqrt{E}} \oplus b$$



$$a = 0.1857 \text{ rad } \sqrt{\text{GeV}}$$

$$b = 0.02979 \text{ rad}$$