Central Tracker Benchmark: $\bar{p}p \rightarrow n(\pi^{+}\pi^{-})$ (n=1,2)

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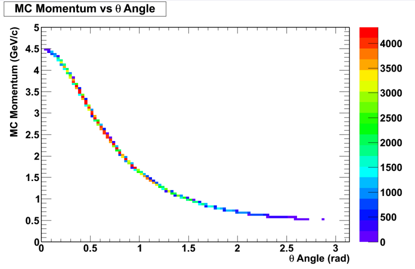
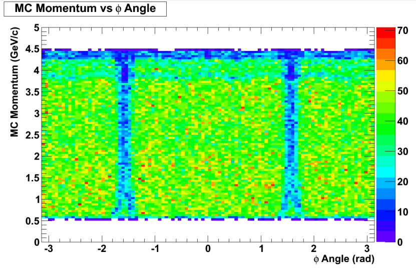
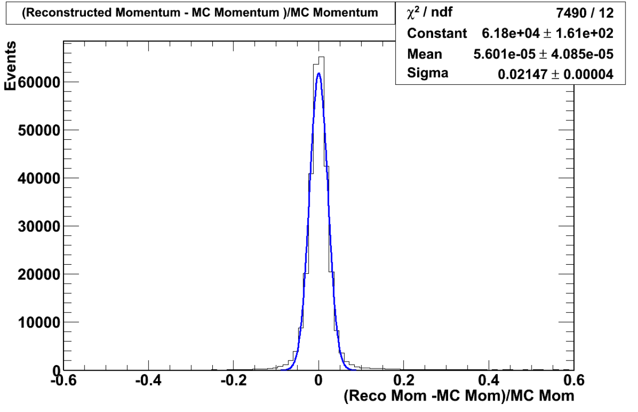
$$\bar{p}p \rightarrow \pi^+\pi^-$$

Single pion track reconstruction



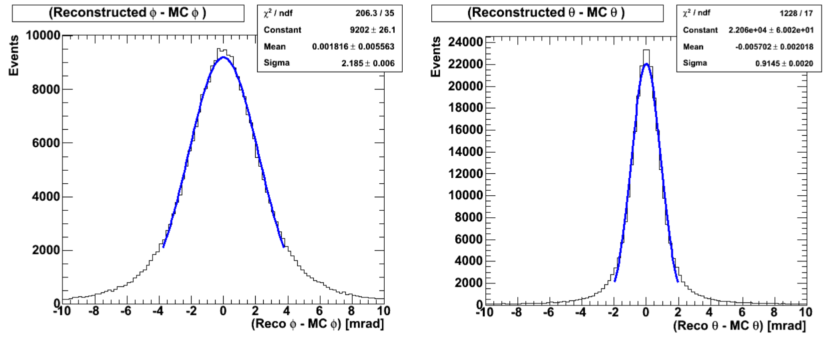


Single pion track reconstruction



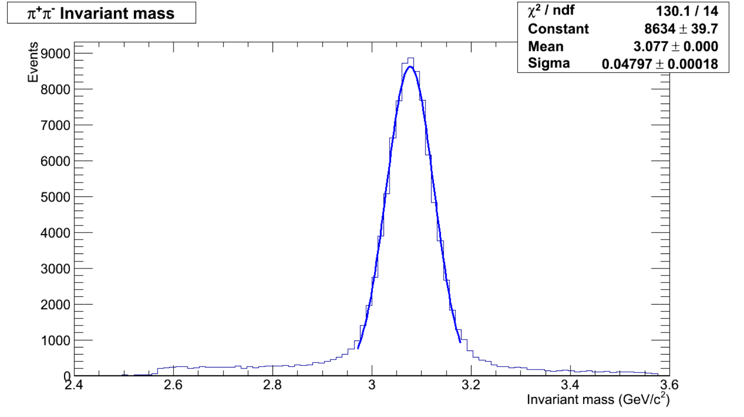
Resolution: $(2.15 \pm 0.01)\%$

θ, ϕ resolution



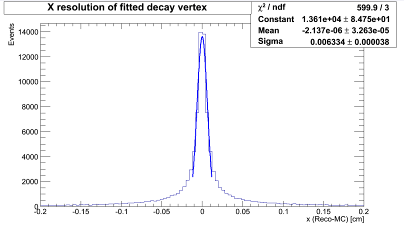
$\sigma(\phi)$=(2.185$\pm$0.006) mrad
$\sigma(\theta)$=(0.915$\pm$0.002) mrad

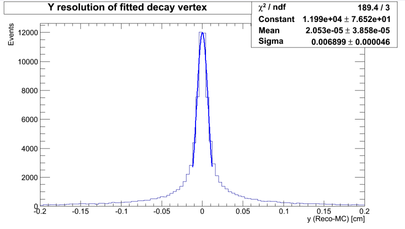
Invariant mass distribution

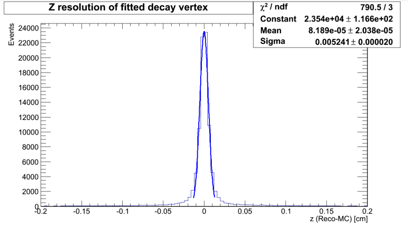


Resolution: 47.97 ± 0.18 MeV/c^2
Efficiency (59.95 ± 0.19)%

Efficiency=Number of reconstructed events/ number of generated events.





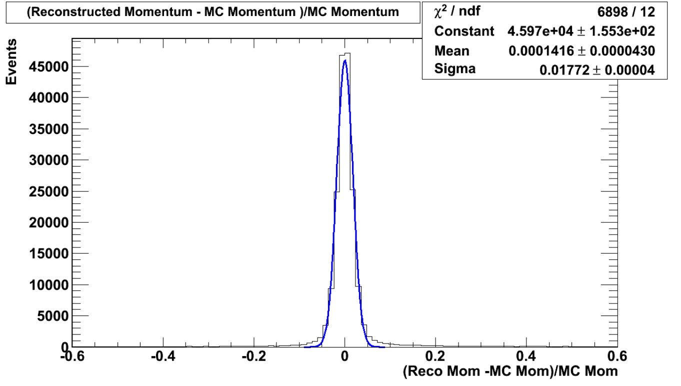


σ_x :(63.34±0.38) μm; σ_y :(68.99±0.46) μm; σ_z :(52.41±0.20) μm;

$\bar{p}p \rightarrow \pi^+\pi^-\pi^+\pi^-$

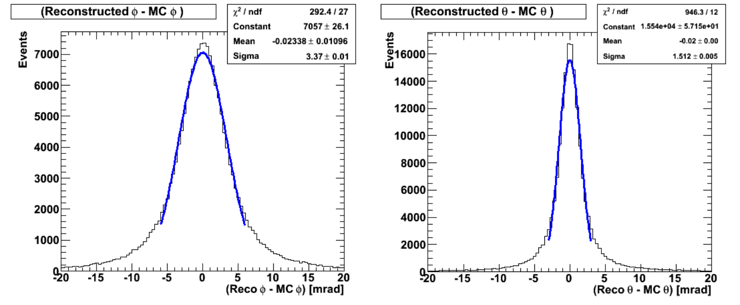
Event mixing

Single pion track reconstruction



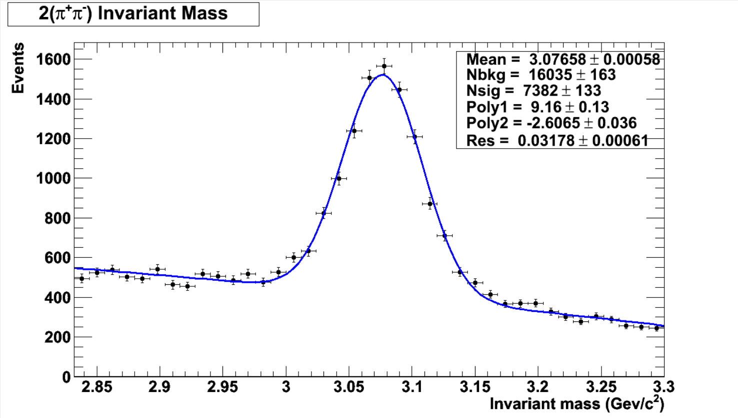
Resolution: $(1.77 \pm 0.01)\%$

θ, ϕ resolution



$\sigma(\phi)=(3.370\pm0.124)$ mrad
$\sigma(\theta)=(1.512\pm0.005)$ mrad

Invariant mass distribution



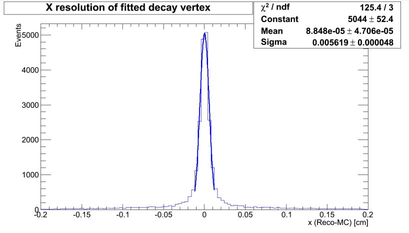
Resolution: 31.78 ± 0.61 MeV/c^2

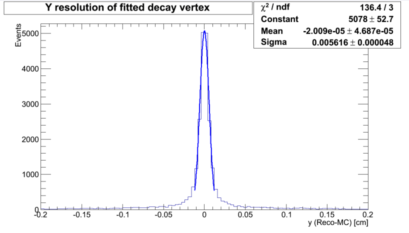
Efficiency $(12.67 \pm 0.15)\%$

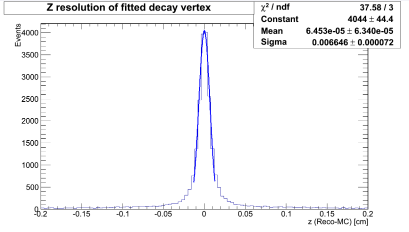
The fit is done with a gaussian function plus a first-order polynomial to take into account the combinatorial background.

Efficiency=Number of reconstructed events/ number of generated events.

Vertex resolution







σ_x :(56.19±0.48) μm; σ_y :(56.16±0.48) μm; σ_z :(66.46±0.72) μm;