

Sample of $D^0 \rightarrow K^- \pi^+ \pi^0$

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$$D^0 \rightarrow K^- \pi^+ \pi^0$$

MC Truth Sample Reconstruction

- Reconstruct $D^{*+} \rightarrow D^0(\rightarrow K^- \pi^+ \pi^0) \pi^+$
- Introduce PID efficiency by reconstructing $D^0 \rightarrow hh\pi^0$ ($h : p, K^-, \pi^+$)
 - Identify the vertex of $p/K^-/\pi^+$
 - Search for another $p/K^-/\pi^+$ vertex and the π^0 vertex, ensuring spatial consistency
 - Apply momentum resolution to selected particles
 - Reconstruct the mother particle trajectory of $hh\pi^0$ and match with the π^+ original vertex

Truth Sample Statistics

	Entries
Collisions	40,300
$p/K/\pi$ vertex	892,334
Vertex pairs	1,771,075
Pair + π^0 vertex	10,498,061
Mother Particle	Resolution
Position	0.05 mm
Momentum	0.001 GeV
θ	0.0002 rad
ϕ	0.00001 rad

表: Truth Sample: $M \rightarrow hh\pi^0$

$$D^0 \rightarrow K^- \pi^+ \pi^0$$

Reconstructed D^0 Mass Distribution

- Mass spectrum of D^0 from reconstructed $M \rightarrow hh\pi^0$ decay.
- Provides insight into resolution effects and selection criteria.

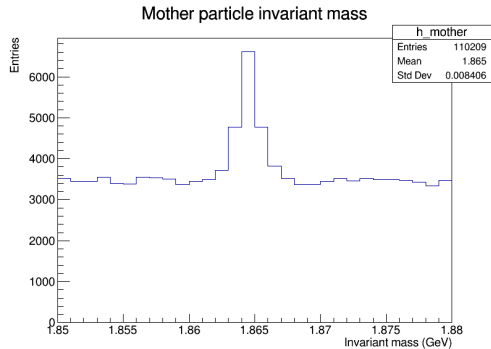


图: Reconstructed D^0 Mass

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Reconstructed D^{*+} and D^0 Mass Distributions

- Mass distribution of D^{*+} reconstructed from $D^0 \pi^+$.
- D^0 mass spectrum under the D^{*+} mass window.

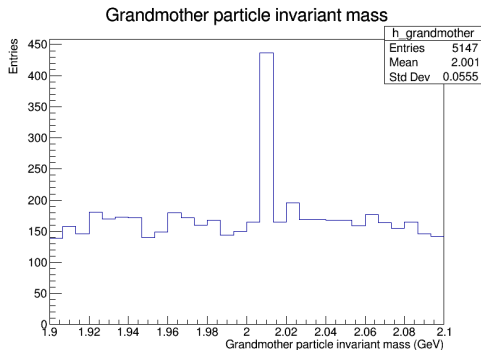


图: Reconstructed D^{*+} Mass

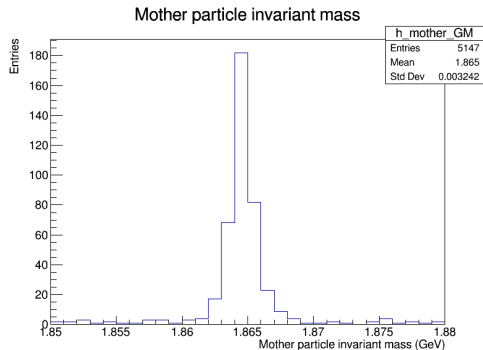


图: D^0 Mass Under D^{*+} Selection

$$D^0 \rightarrow K^- \pi^+ \pi^0$$

Comparison of MC Truth and Reconstructed Dalitz Plots

- Reconstructed sample from pure $D^0 \rightarrow K^- \pi^+ \pi^0$ events.
- Dalitz plot suggests possible contamination from $\pi^+ \pi^- \pi^0$ due to PID misidentification.

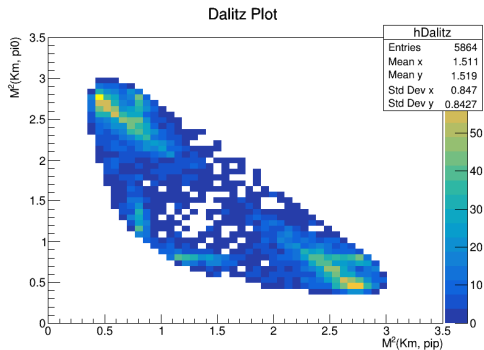


图: MC Truth Dalitz Plot

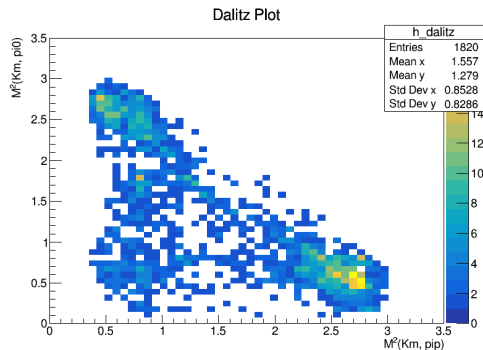


图: Reconstructed Dalitz Plot

Thank You