$\Xi^* \rightarrow \Xi\pi^0$ update

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0}$$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

and $\Lambda \rightarrow p\pi^{-}$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

and $\Lambda \rightarrow p\pi^{-}$

- Mass of Ξ^{-} not constrained

Reaction

$$\gamma p \rightarrow K^+ K^+ \Xi^- \pi^0,$$

where $\Xi^- \rightarrow \Lambda \pi^-$

and $\Lambda \rightarrow p \pi^-$

- Mass of Ξ^- not constrained

Requires 2 steps to obtain Ξ^* :

Reaction

$$\gamma p \rightarrow K^+ K^+ \Xi^- \pi^0,$$

where $\Xi^- \rightarrow \Lambda \pi^-$

and $\Lambda \rightarrow p \pi^-$

- Mass of Ξ^- not constrained

Requires 2 steps to obtain Ξ^* :

- Step 1: $\gamma p \rightarrow K Y^*$: Completed

- Step 2: $Y^* \rightarrow K \Xi^*$: Still needs refinement

Ξ^* Generator Refinement

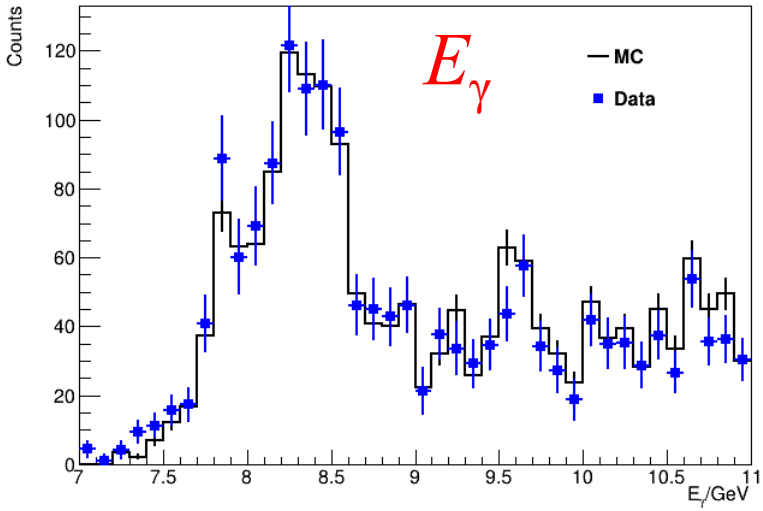
- Starting with code from Brandon build for $\Xi(1530)$ and modifying for general Ξ^*
- Taking the initial reaction as $\gamma\, p \rightarrow K\, Y^*$
- Mandelstam variables have relationship:
  - $s+t+u = m_\gamma^2 + m_p^2 + m_K^2 + m_{Y*}^2$
- We can lock down the kinematics of the initial reaction by specifying s, t and m_{Y*}
- Started with Mandelstam s and t

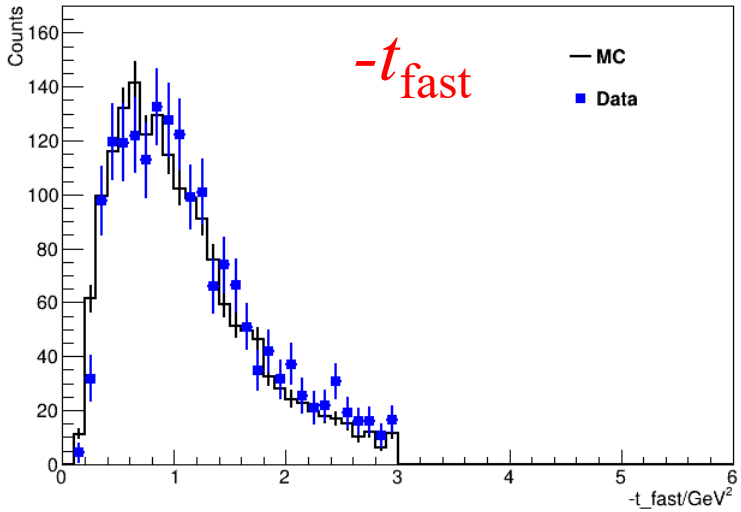
Ξ^* Comparison of Reconstructed MC to Actual Data

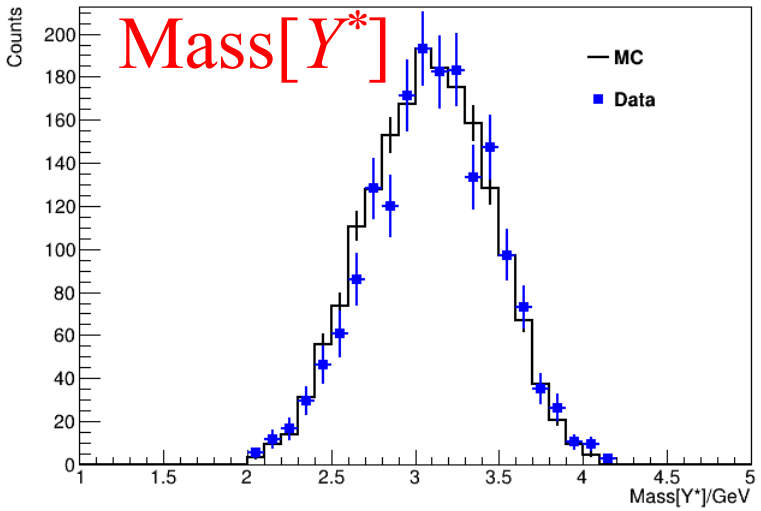
- Rounds 1-3: of MC to set t-slope (parameter b in $Ae^{-b|t|}$) to 1.138/GeV^2
- Round 4: First pass at shaping mass[Y^*]
- Round 5: Second pass at shaping mass[Y^*]
- Round 6: coding errors
- Round 7: coding errors
- Round 8: I went back to round 4 and cut out events with $|t_{fast}| >$ 3 GeV^2

Shown before

Ξ^* Comparison of Reconstructed MC to Actual Data Round 8





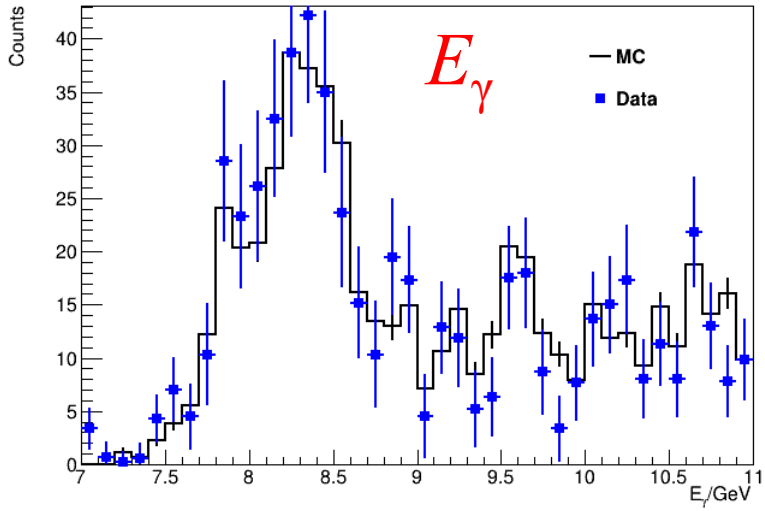


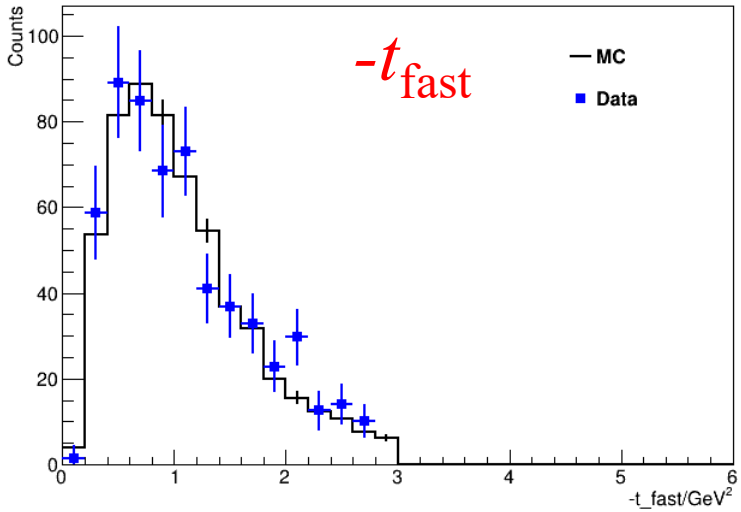
Ξ^* Comparison of Reconstructed MC to Actual Data

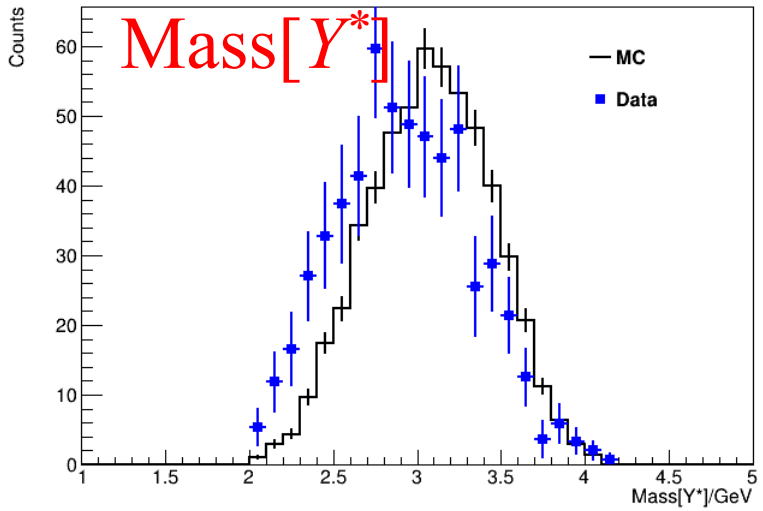
- Rounds 1-3: of MC to set t-slope (parameter b in $Ae^{-b|t|}$) to 1.138/GeV^2
- Round 4: First pass at shaping mass[Y^*]
- Round 5: Second pass at shaping mass[Y^*]
- Round 6: coding errors
- Round 7: coding errors
- Round 8: I went back to round 4 and cut out events with $|t_{fast}| >$ 3 GeV^2
- Round 8B: Required mass of Ξ^* to be < 1.8 GeV (range of interest)

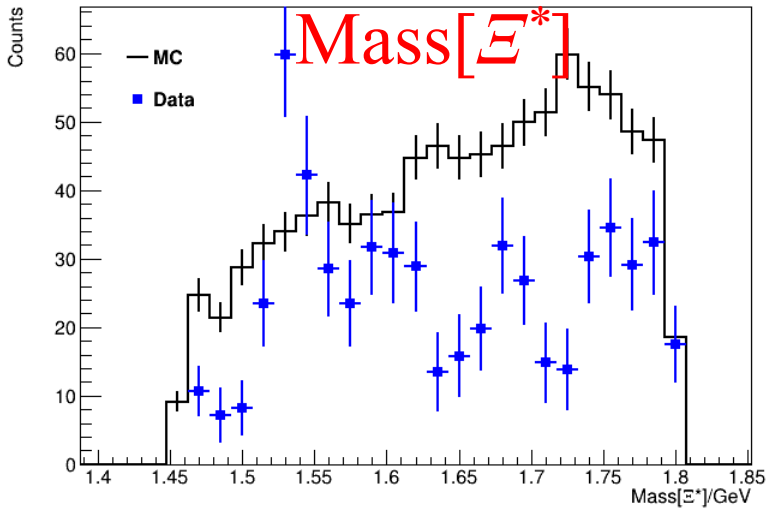
New

Ξ^* Comparison of Reconstructed MC to Actual Data Round 8B









Ξ^* Comparison of Reconstructed MC to Actual Data

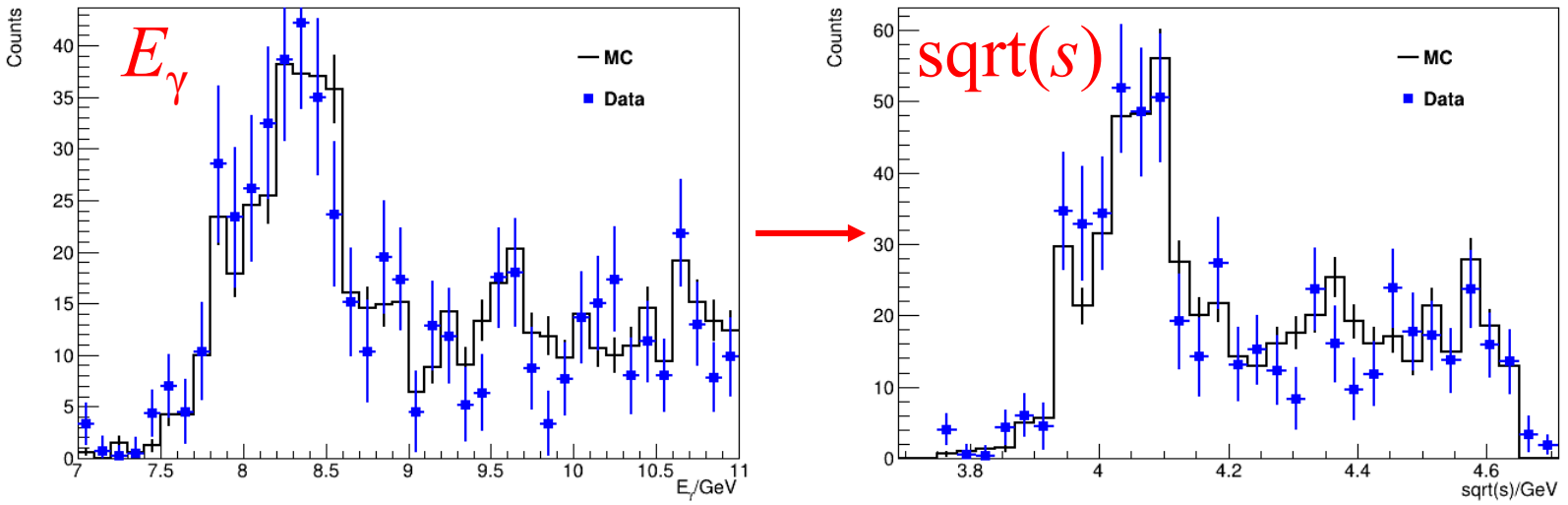
- Rounds 1-3: of MC to set t-slope (parameter b in $Ae^{-b|t|}$) to 1.138/GeV^2
- Round 4: First pass at shaping mass[Y^*]
- Round 5: Second pass at shaping mass[Y^*]
- Round 6: coding errors
- Round 7: coding errors
- Round 8: I went back to round 4 and cut out events with $|t_{fast}| >$ 3 GeV^2
- Round 8B: Required mass of Ξ^* to be < 1.8 GeV (range of interest)
- Round 9: Shape mass of Ξ^* and Reshape Y^*

New

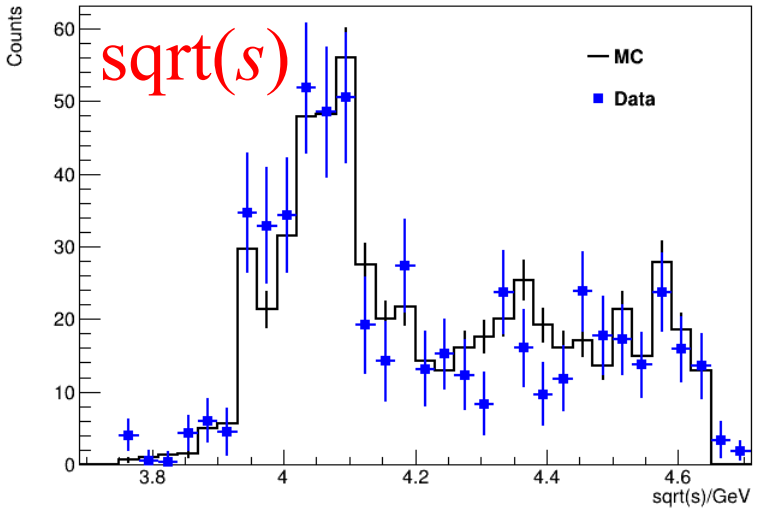
Ξ^* Comparison of Reconstructed MC to Actual Data Round 9 (slide 1)

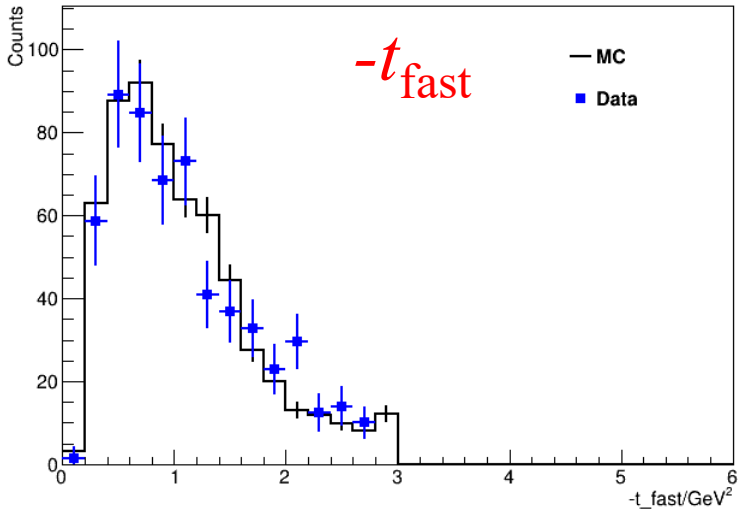
From this slide forward I am switching from histograms in E_γ to histograms in sqrt(s)

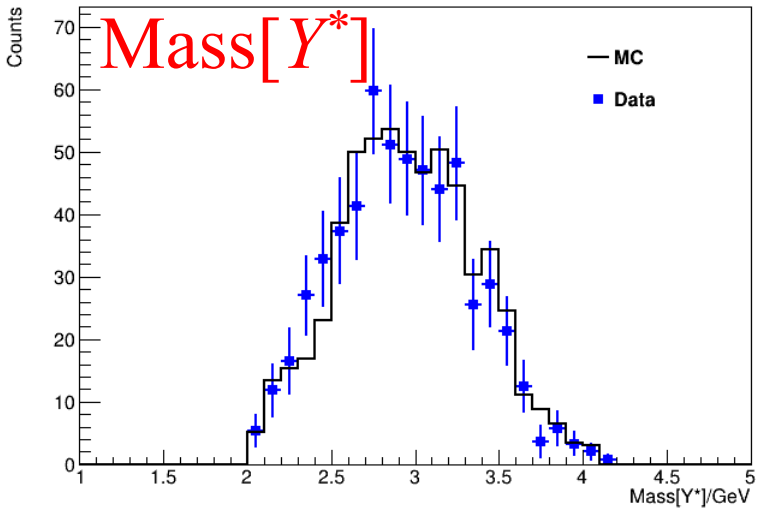
Note: Straight-forward mapping of E_γ to s: $s = 2E_\gamma m_p + m_p^2$

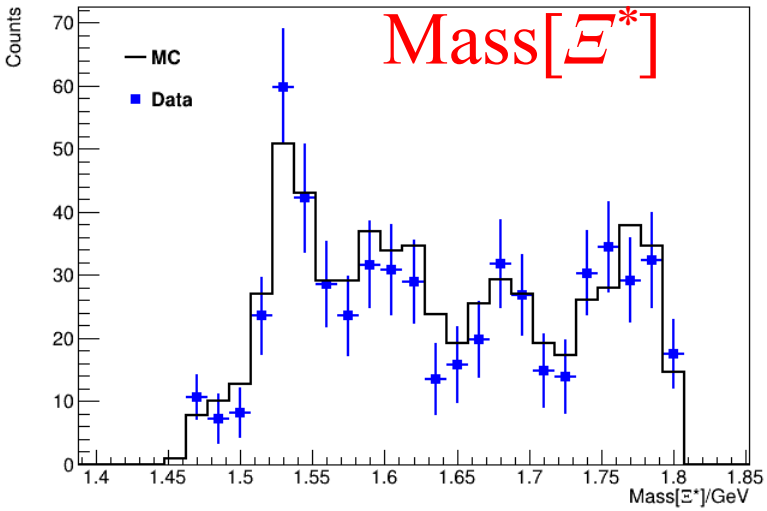


Ξ^* Comparison of Reconstructed MC to Actual Data Round 9 (slide 1)

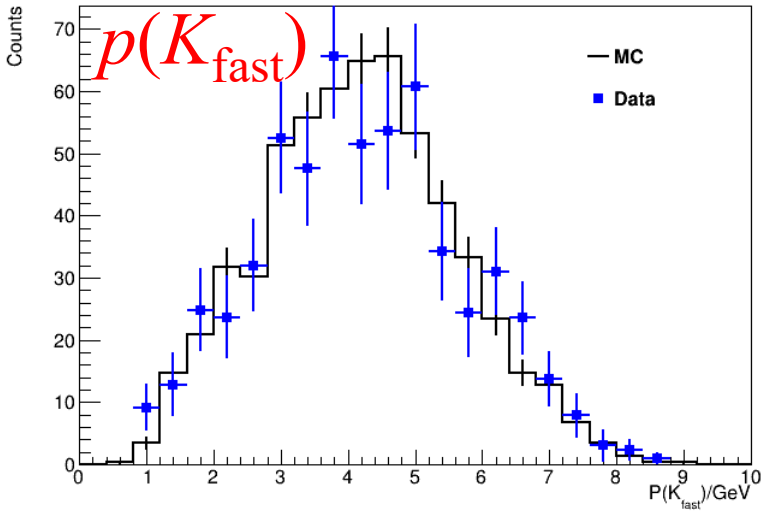








Ξ^* Comparison of Reconstructed MC to Actual Data Round 9 (slide 2)



Near future:

- $p(K_{slow})$
- Angles for K_{slow} and K_{fast}

After kaon comparisons

- Look at backgrounds using side bands

Title