

Box Opening

Results

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Systematic uncertainty study list

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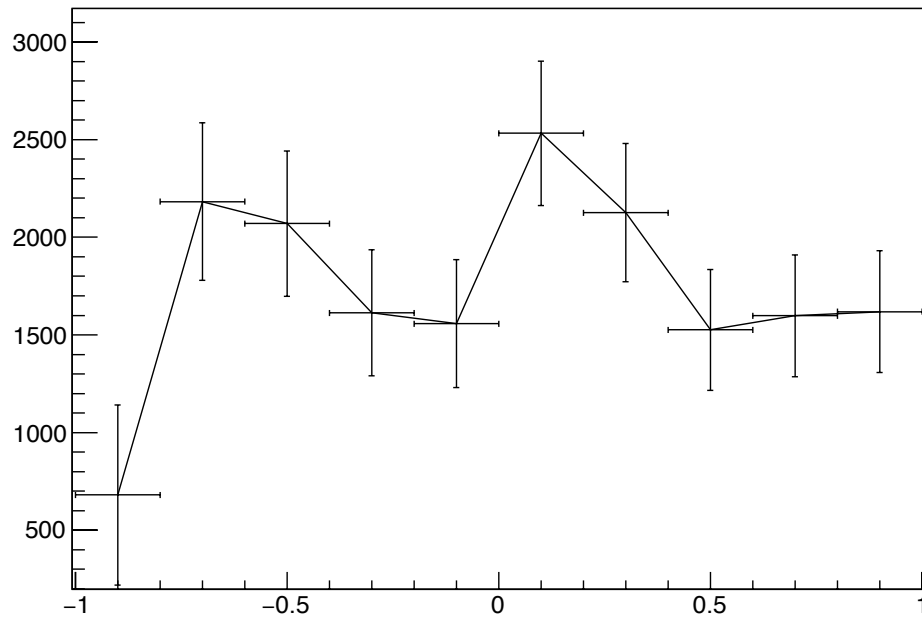
8 Jan, 2020

Box Open Result

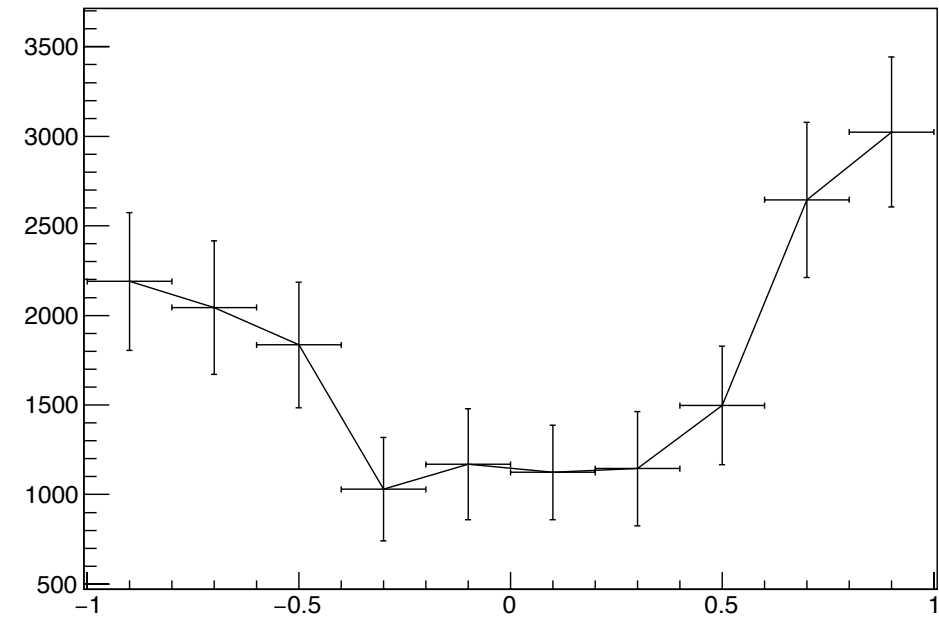
- Spin -

- $\Xi_c(2970)^+ \rightarrow \Xi_c(2645)^0 \pi^+ : \cos\theta_h$
- $\Xi_c(2970)^+ \rightarrow \Xi_c(2645)^0 \pi^+ \rightarrow \Xi_c^+ \pi^- \pi^+ : \cos\theta_c$

Yield vs $\cos\theta_h$



Yield vs $\cos\theta_c$



$$W_{\frac{1}{2}} = 1$$

$$W_{\frac{3}{2}} = \rho_{33} \left\{ 1 + T \left(\frac{3}{2} \cos^2 \theta_h - \frac{1}{2} \right) \right\} + \rho_{11} \left\{ 1 + T \left(-\frac{3}{2} \cos^2 \theta_h + \frac{1}{2} \right) \right\}$$

$$W_{\frac{5}{2}} = \frac{3}{32} [\rho_{55} 5 \{ (-\cos^4 \theta_h - 2 \cos^2 \theta_h + 3) + T(-5 \cos^4 \theta_h + 6 \cos^2 \theta_h - 1) \} \\ + \rho_{33} \{ (15 \cos^4 \theta_h - 10 \cos^2 \theta_h + 11) + T(75 \cos^4 \theta_h - 66 \cos^2 \theta_h + 7) \} \\ + \rho_{11} 2 \{ (-5 \cos^4 \theta_h + 10 \cos^2 \theta_h + 3) + T(-25 \cos^4 \theta_h + 18 \cos^2 \theta_h - 1) \}]$$

$$W_{\frac{3}{2} \rightarrow \frac{1}{2} + 0} = \frac{3}{2} \left[\rho_{33} \sin^2 \theta_c + \rho_{11} \left(\frac{1}{3} + \cos^2 \theta_c \right) \right]$$

Systematic Uncertainty

- Cut Conditions -

- Momentum fraction x_p
 - $0.7 \rightarrow 0.6 \text{ or } 0.8$
- Mass window for $\Xi_c(2645)$, Ξ_c'
 - For $\Xi_c(2645)$, $\pm 5 \text{ MeV} \rightarrow \pm 3 \text{ or } \pm 7 \text{ MeV}$
 - For Ξ_c' , $\pm 8 \text{ MeV} \rightarrow \pm 6 \text{ or } 10 \text{ MeV}$
- Background function : $1\text{st order poly.} \rightarrow 2\text{nd order poly.}$

Systematic Uncertainty

- Fixed Parameters -

- Resolution function (Double Gaussian)
 - σ of core narrower gaussian : +10% (MC-data correction)
 - ratio of σ of two Gaussians; σ_1/σ_2 : ± 1 x standard deviation
 - ratio of yield of two Gaussians; N_1/N_2 : ± 1 x standard deviation
- Convolution function (Lorentzian)
 - intrinsic width : errors in PDG
- Reconstruction efficiency : ± 1 x standard deviation
- Branching fraction of $\Xi_c^{+,0}$: errors in PDG or references