



# Status report

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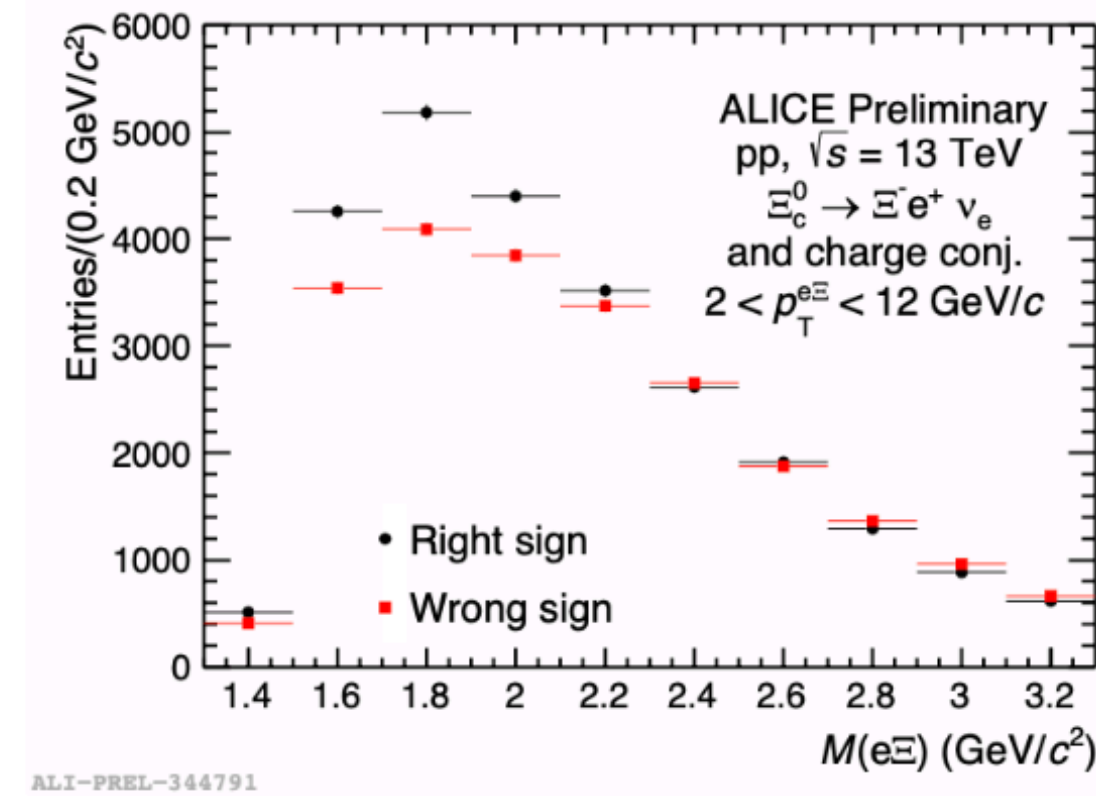
## - Correction of oversubtraction caused by bottom baryon

### • Bottom baryon contribution in WS

- $\Xi_{cb} \rightarrow \Xi e \nu$  neutrino
- The  $\Xi_{cb}$  baryons are not measured at LHC energies

### • Assumption

- The shape of  $p_T$  spectrum is same as  $\Lambda_b$ .
- The  $B(b \rightarrow \Xi_{cb})B(\Xi_{cb} \rightarrow e \Xi X) / (B(b \rightarrow \Lambda_b)B(\Lambda_b \rightarrow e \Lambda X))$  ratio is the same in ee and pp collisions.



### - Make $e^+ \Xi^-$ pair

- RS(Right Sign) and WS(Wrong Sign) are made.  
→ RS :  $e^+ \Xi^-$  and  $e^- \Xi^+$   
WS :  $e^- \Xi^-$  and  $e^+ \Xi^+$
- WS pairs are used to estimate background .

## - Correction of oversubtraction caused by bottom baryon

### • Strategy

1. Fit  $\Lambda_b$  7TeV measurement using Tsallis function.

$$C \cdot p_T \left[ 1 + \frac{\sqrt{p_T^2 + m^2} - m}{nT} \right]^{-n}$$

CMS:  $n = 7.6 \pm 0.4$ ,  $T = 1.10$  GeV (fixed, determined by  $B^{0,+}$ )

2.  $\Lambda_b$  7TeV measurement is scaled to 13TeV by FONLL.

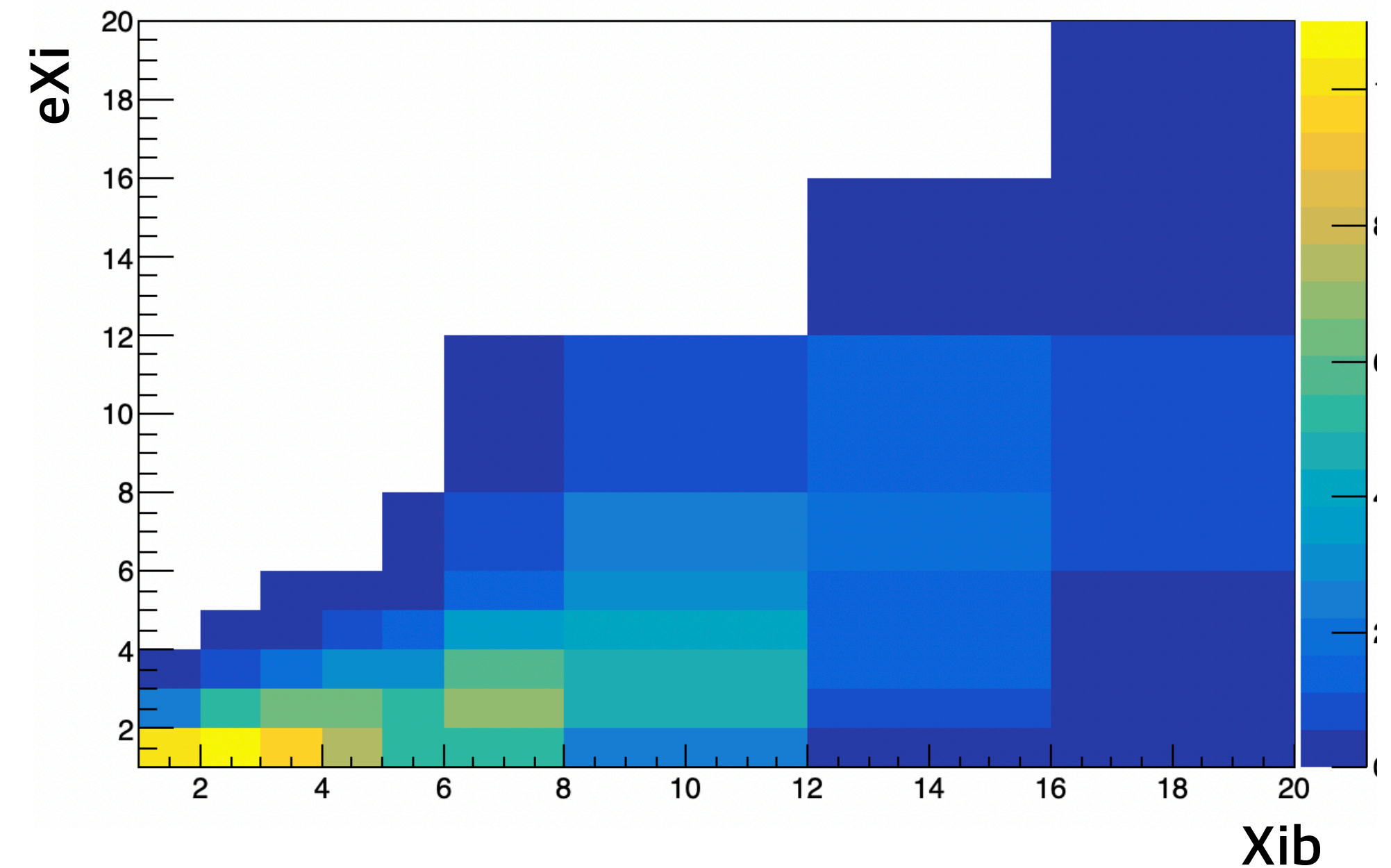
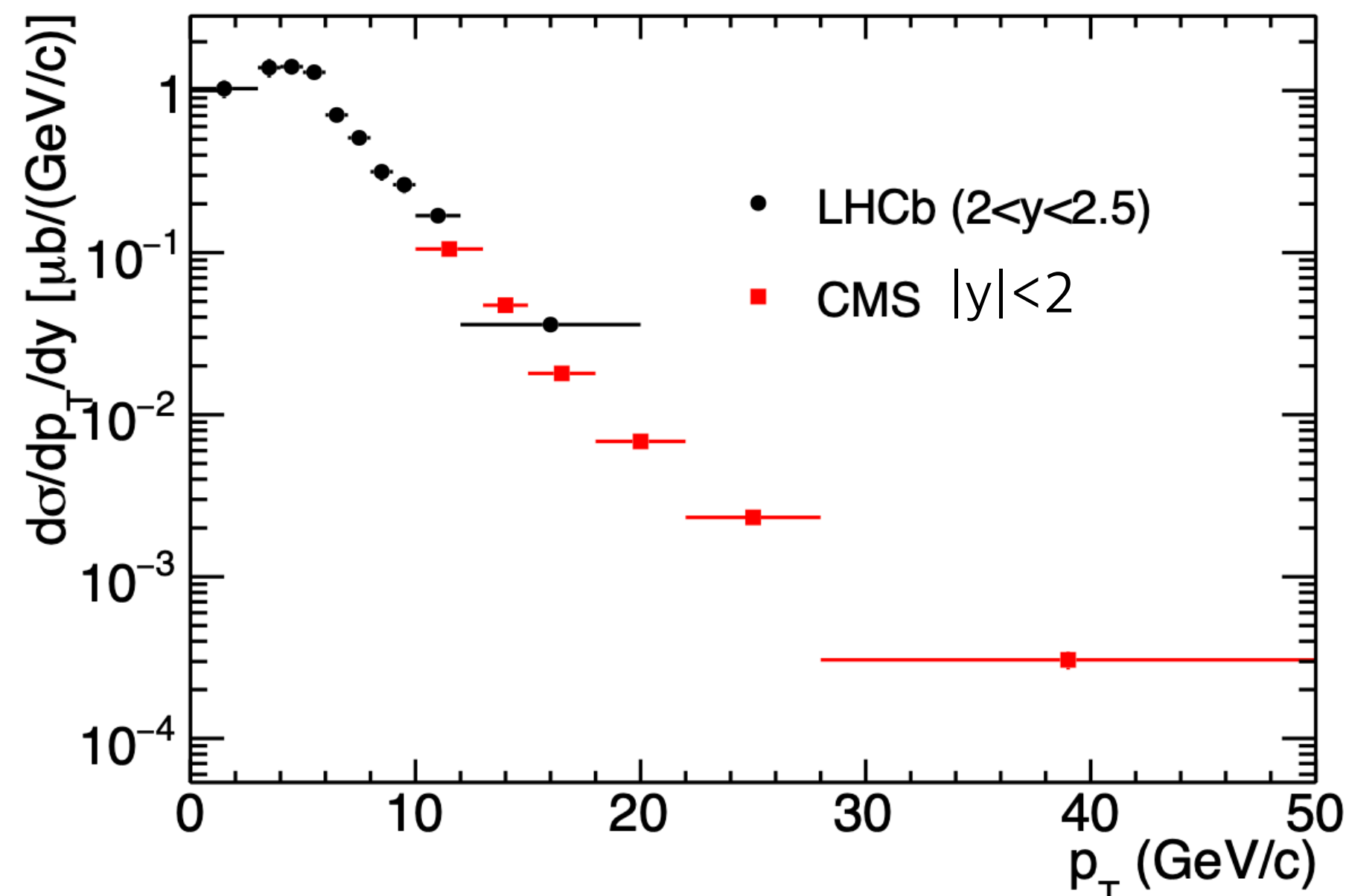
3. Multiply branching ratio factor

$$\frac{BR(b \rightarrow \Xi_b)BR(\Xi_b \rightarrow e\Xi\nu)}{BR(b \rightarrow \Lambda_b)BR(\Lambda_b \rightarrow e\Lambda\nu)}$$

4. Multiply Xib efficiency

$$Efficiency = \frac{\Xi_b(Reco, WS)}{\Xi_b(Gen)_{|y|<0.5}}$$

5. Convert Xib pT to eXi pT using response matrix



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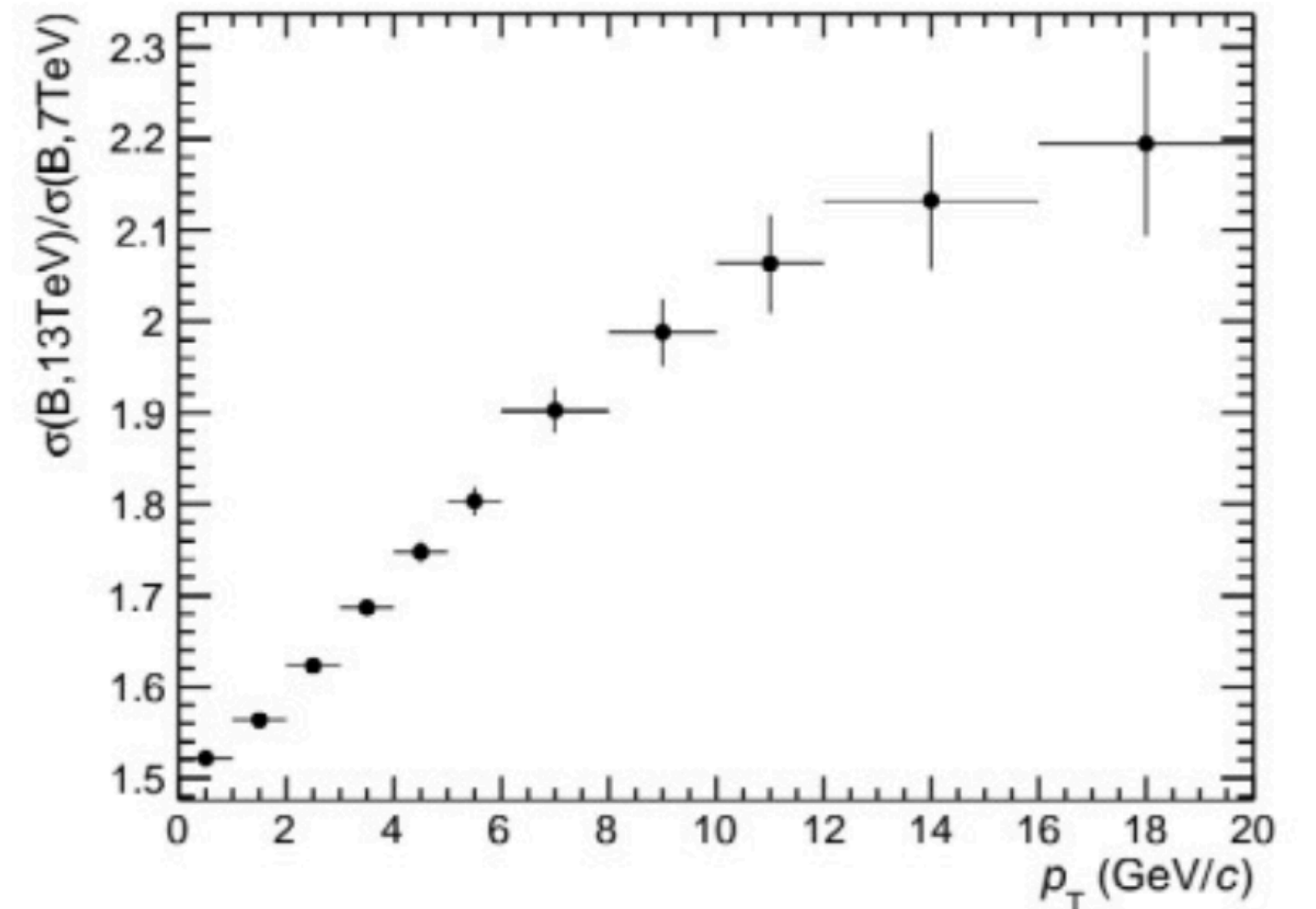
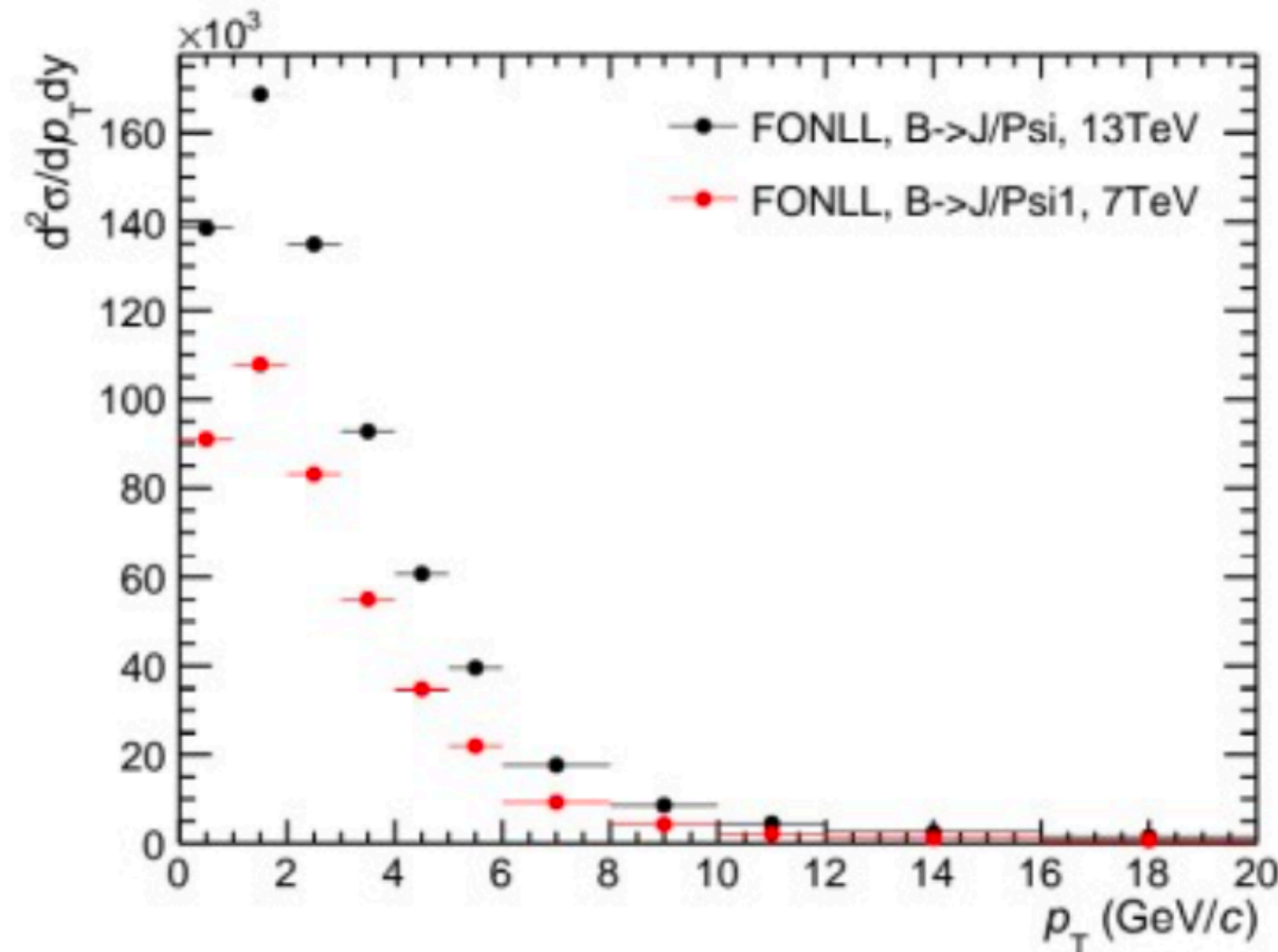
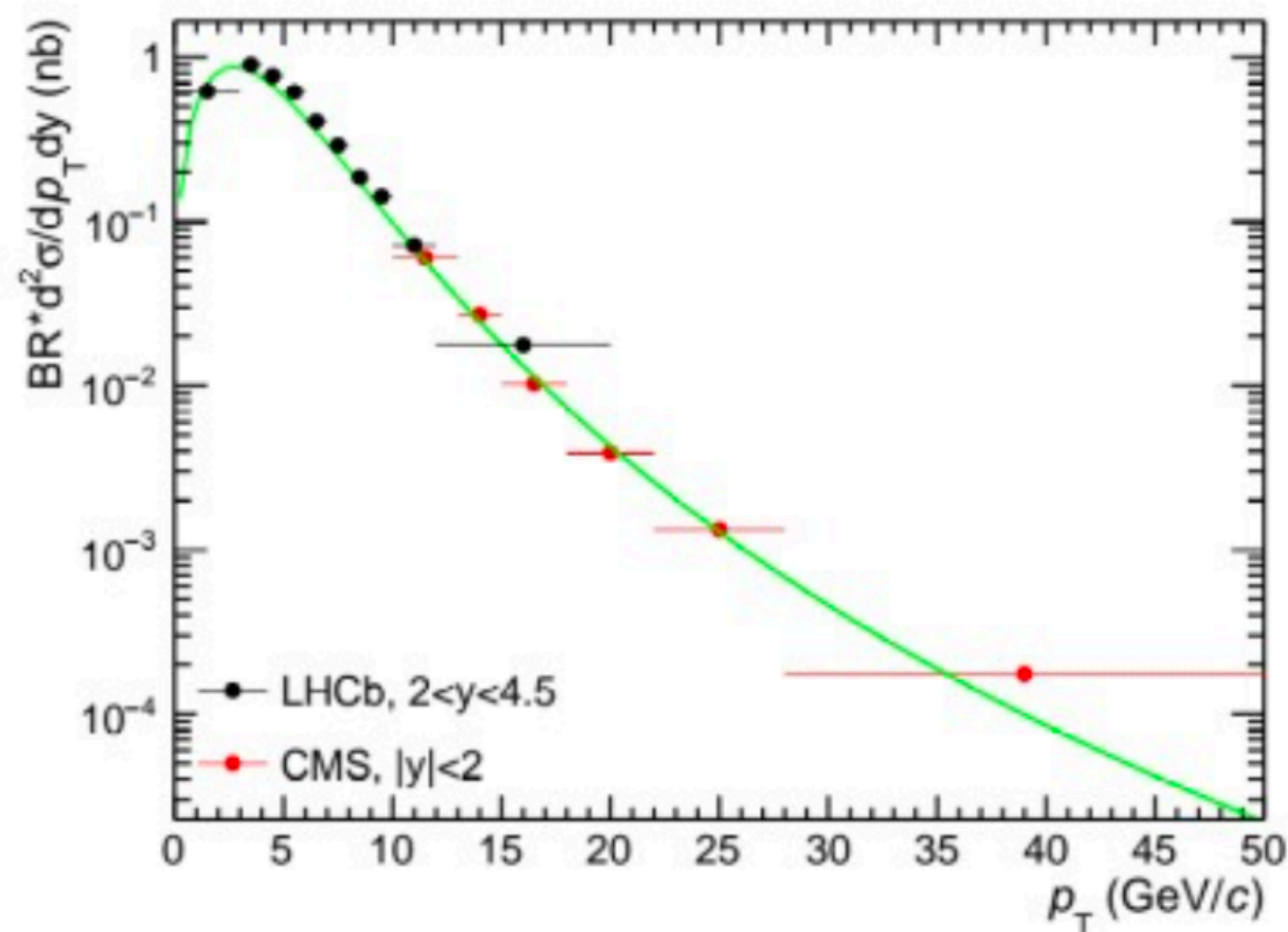
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- Measurement from CMS is fit by Tsallis function ( CMS fit parameter is used)

- Assumption : B ratio =  $\Lambda_b$  ratio

- B meson 13TeV/7TeV is fit by pol4.

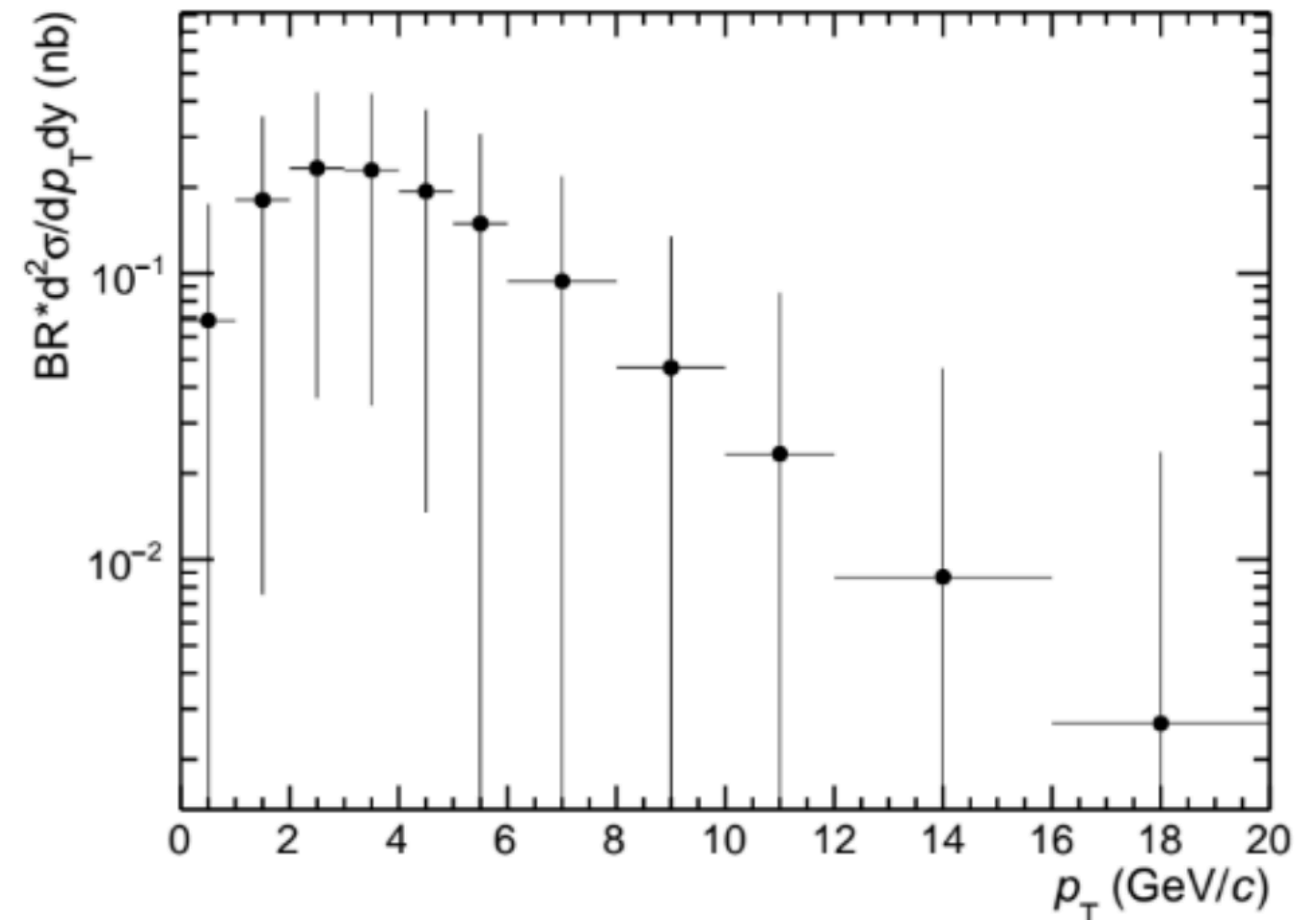
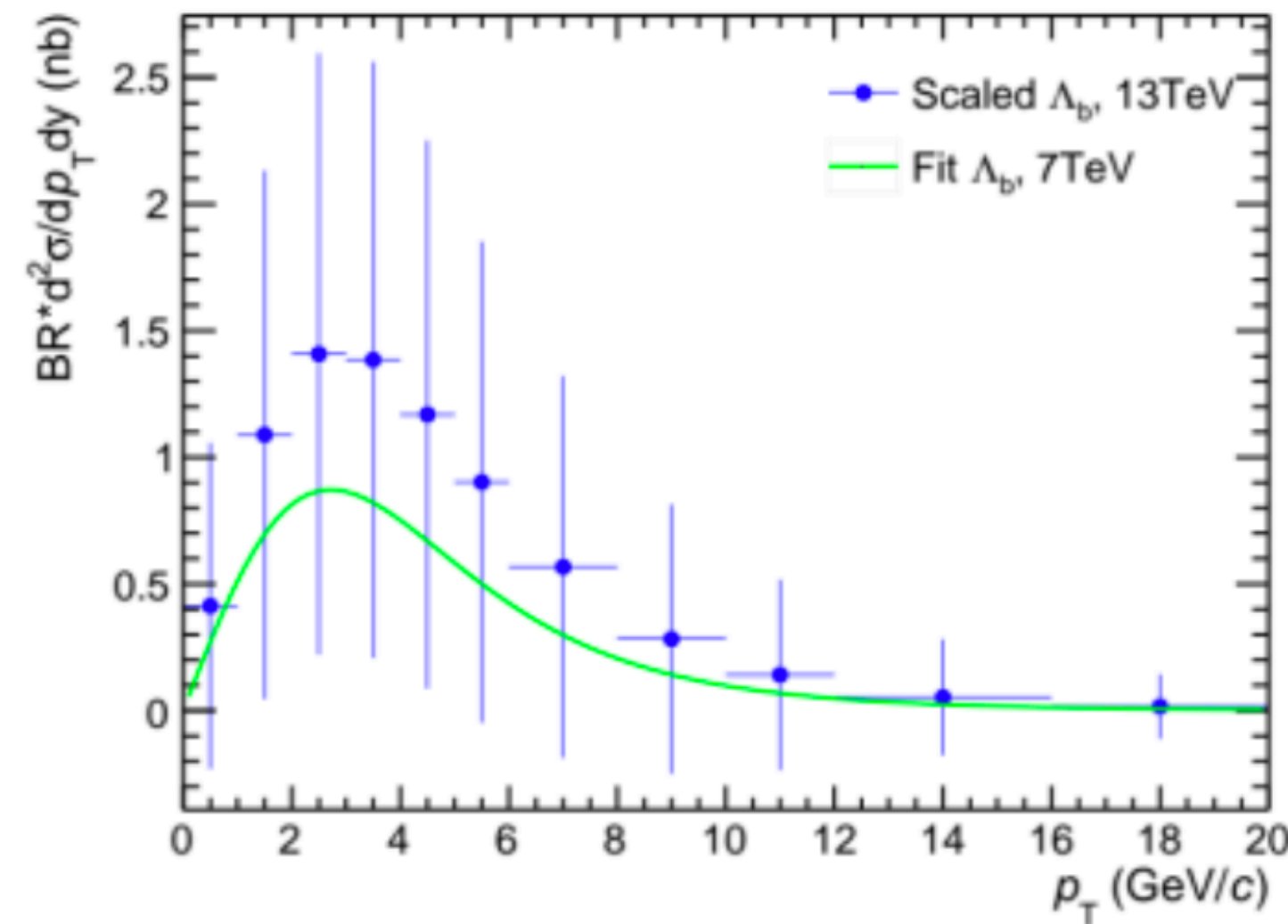
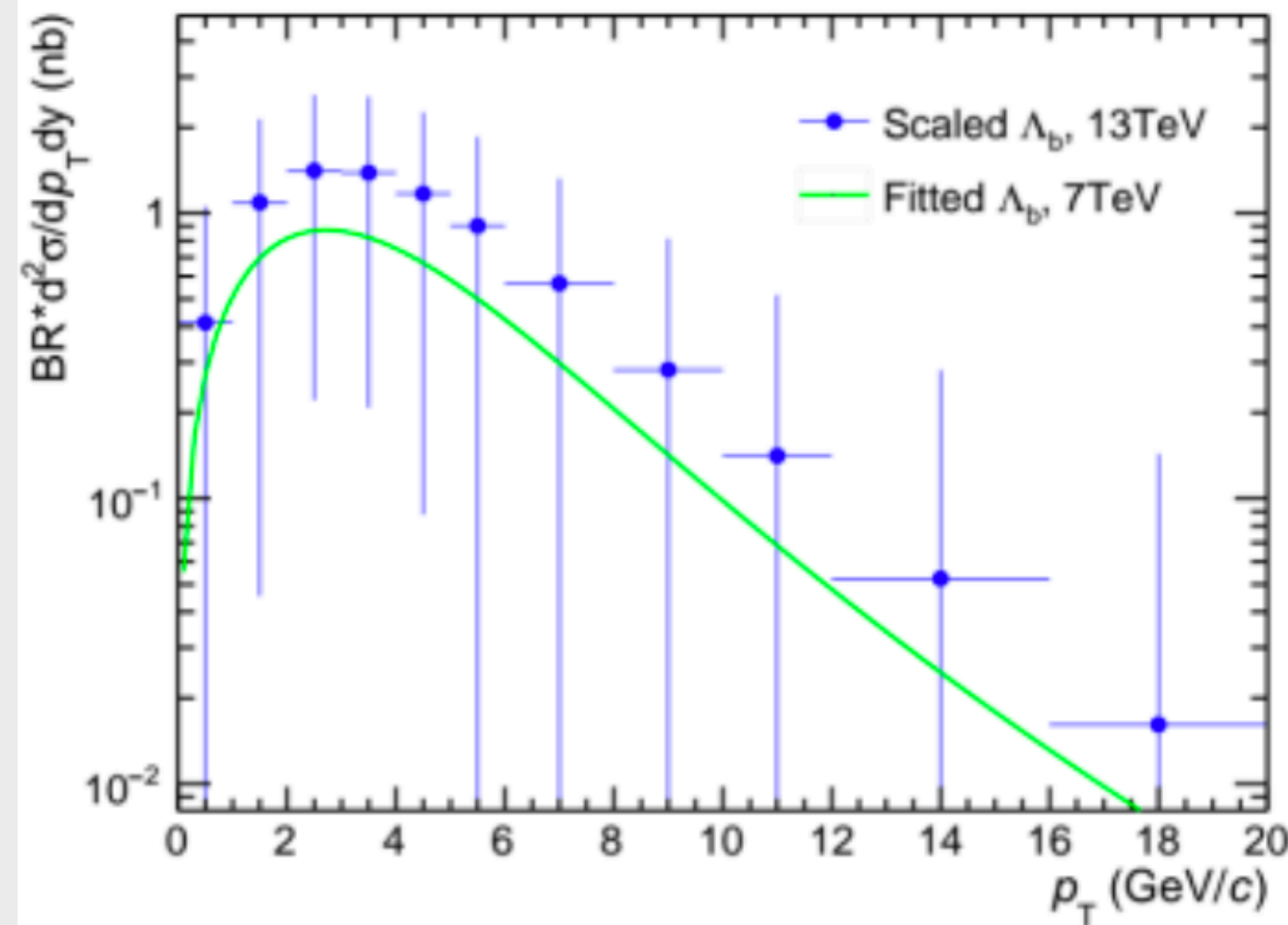




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- 13TeV Lambda b spectrum is obtained by 7TeV Lambda b measurement and  $B(13\text{TeV})/B(7\text{TeV})$ .
  - Error calculation is needed but is not critical for results.
- 13TeV  $\Xi$  b spectrum is obtained by 13TeV Lambda b spectrum and Branching ratio's fraction.

$$\frac{BR(b \rightarrow \Xi_b)BR(\Xi_b \rightarrow e\Xi\nu)}{BR(b \rightarrow \Lambda_b)BR(\Lambda_b \rightarrow e\Lambda\nu)} = \frac{3.26 \pm 0.16(\text{stat.}) \pm 0.39(\text{syst.}) * 10^{-3}}{5.4 \pm 1.1(\text{stat.}) \pm 0.8(\text{syst.}) * 10^{-4}}$$





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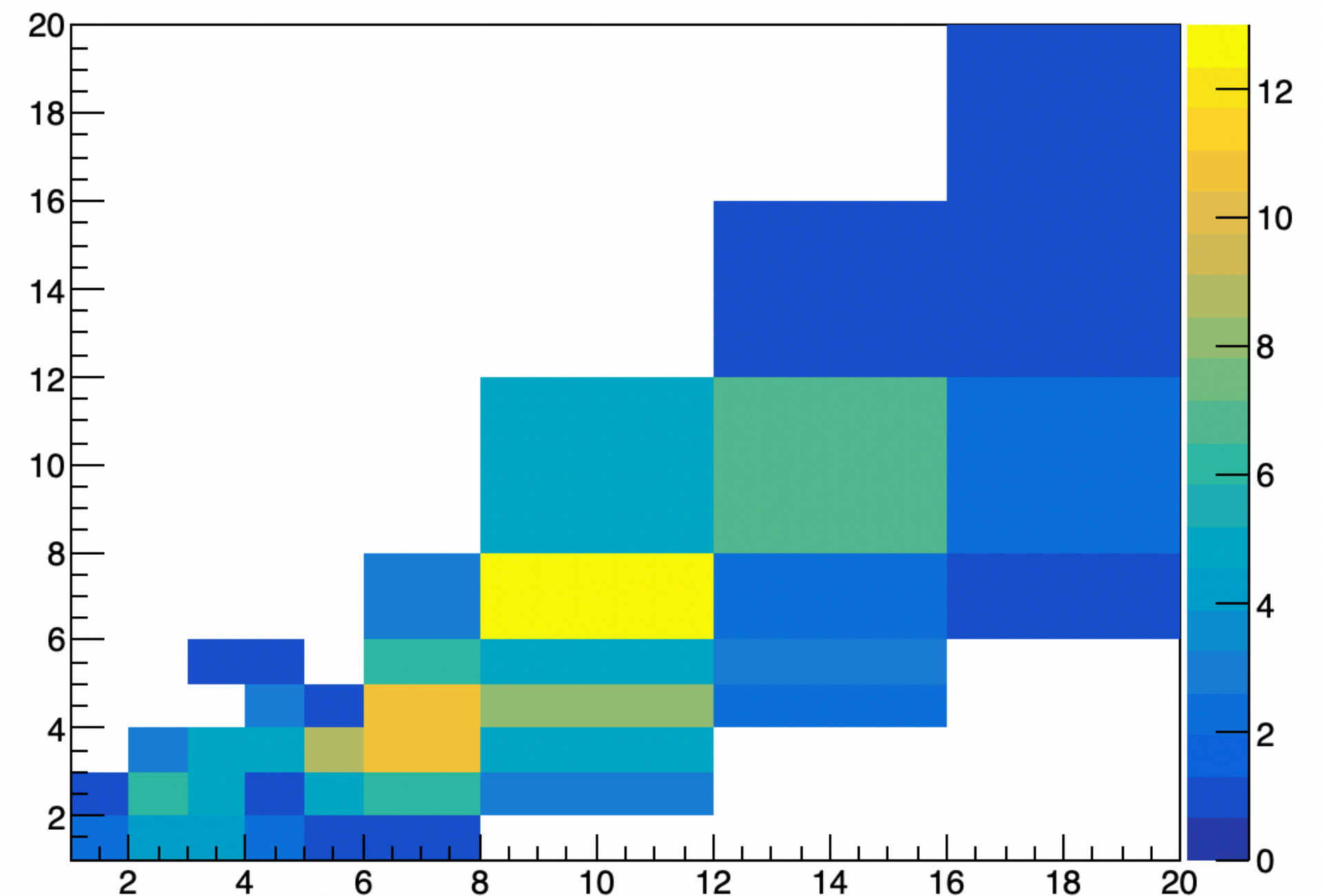
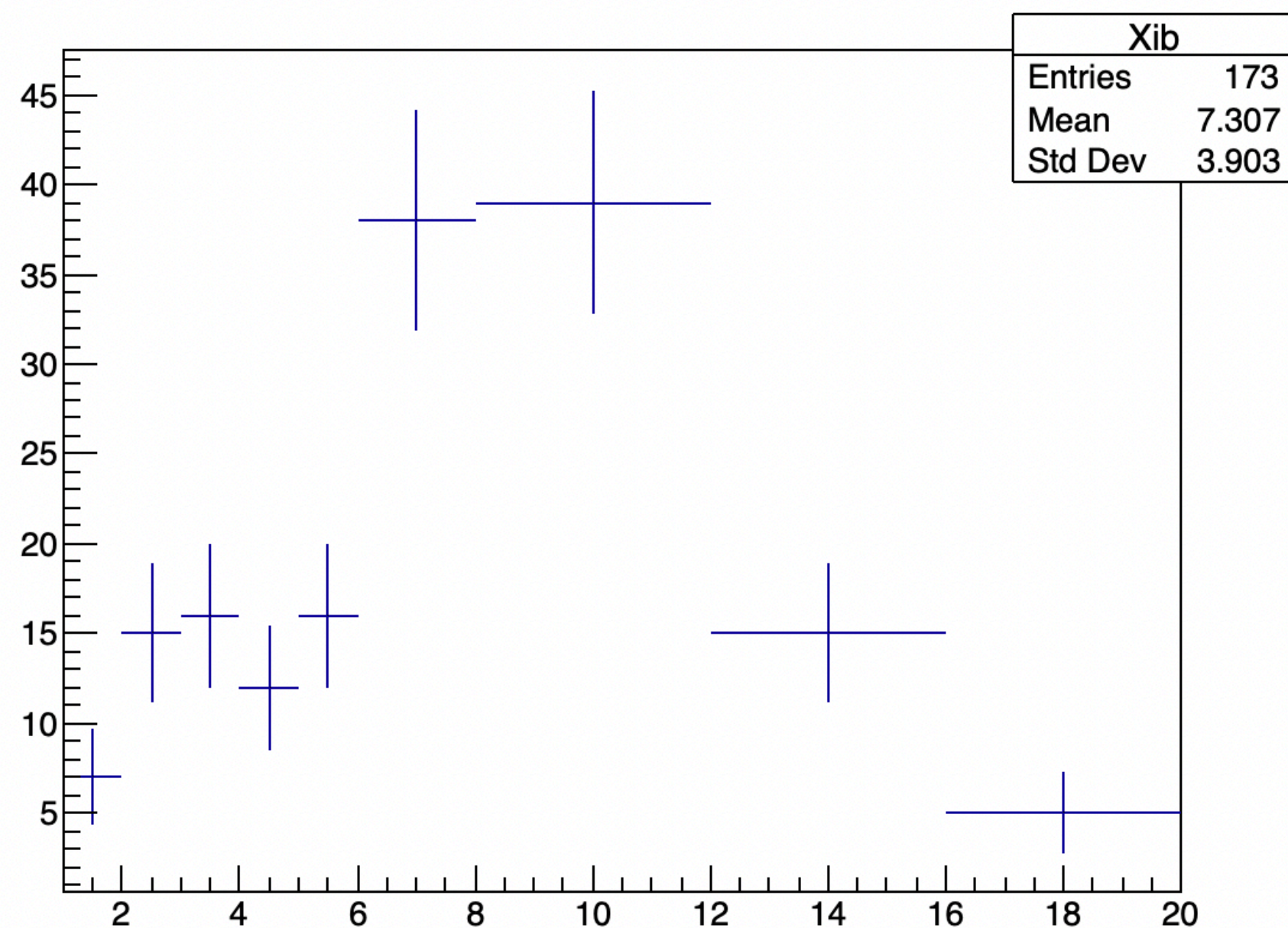
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Back up

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