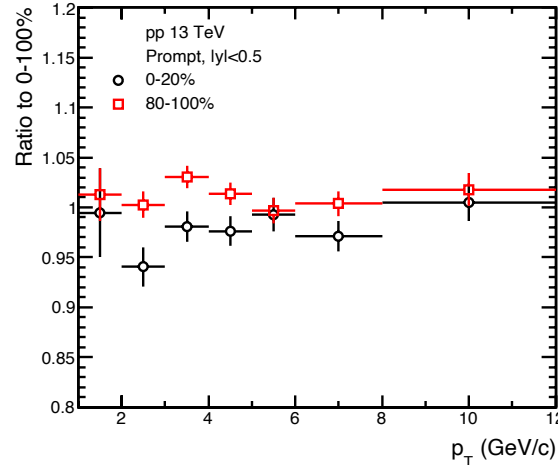
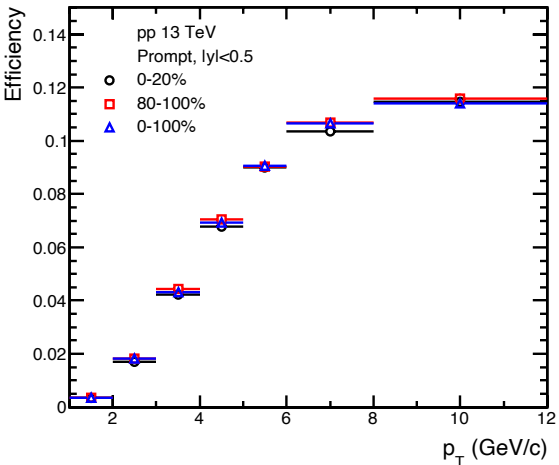
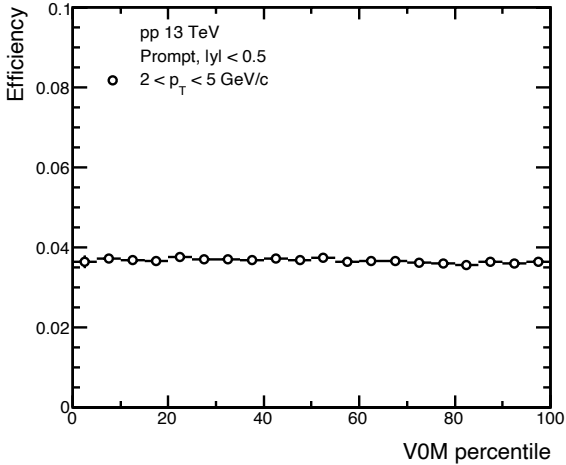
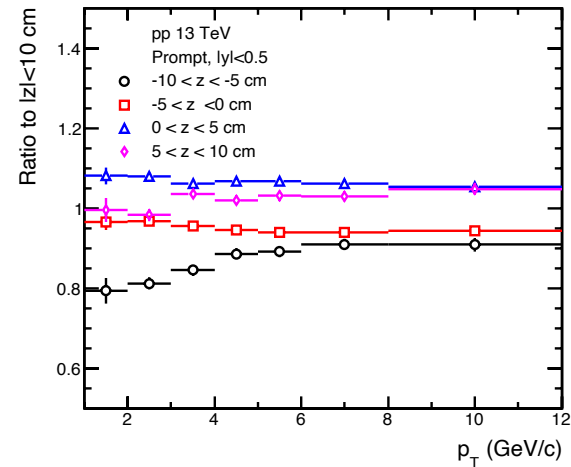
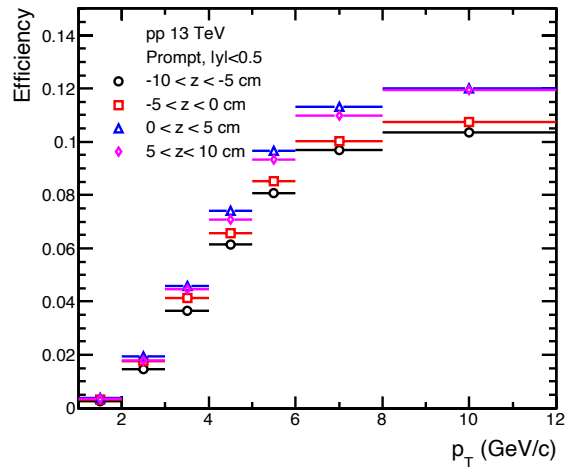
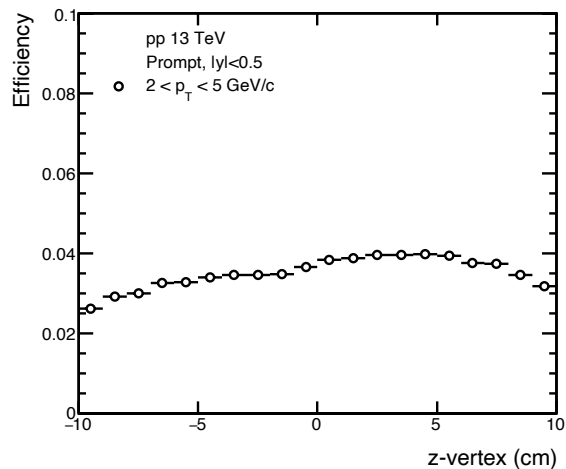


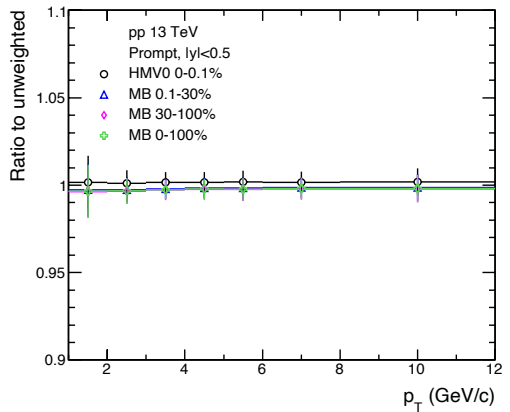
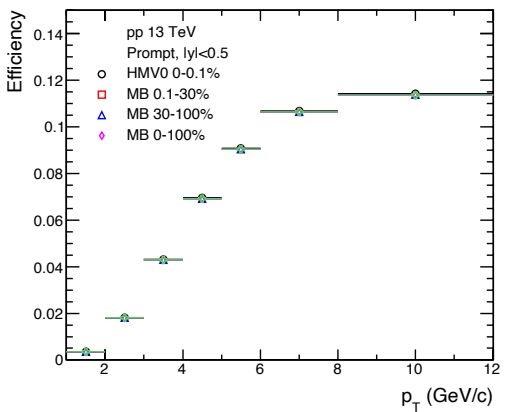
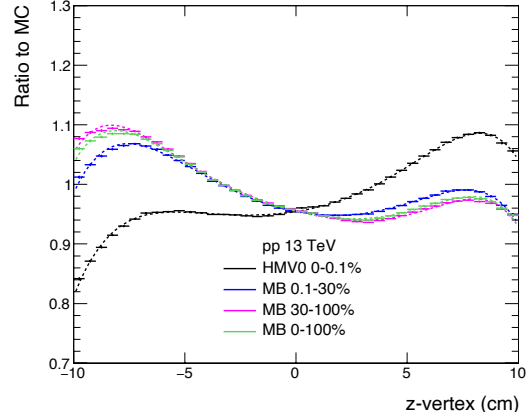
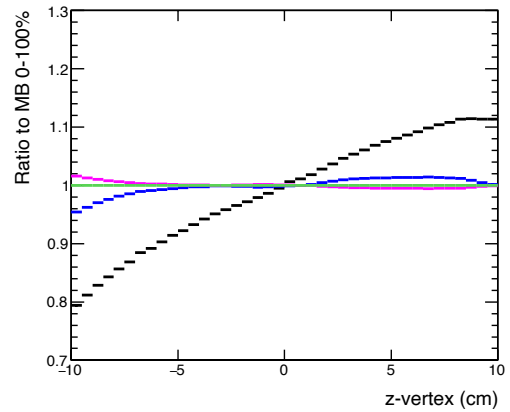
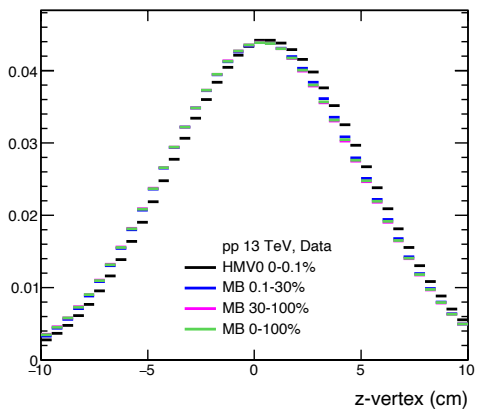
- Little multiplicity dependence
- Not enough statistics to check the efficiency in 0-0.1% VOM multiplicity



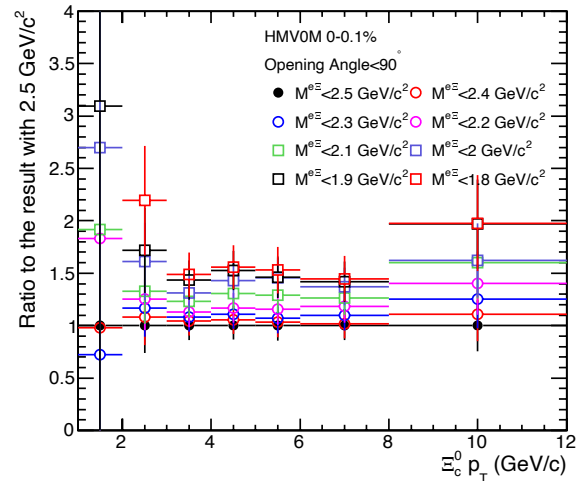
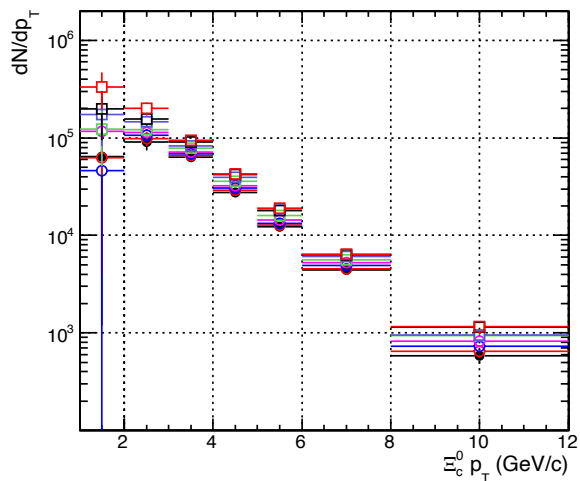
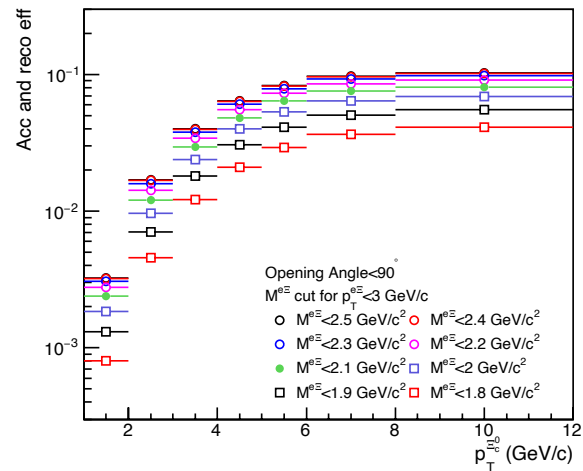
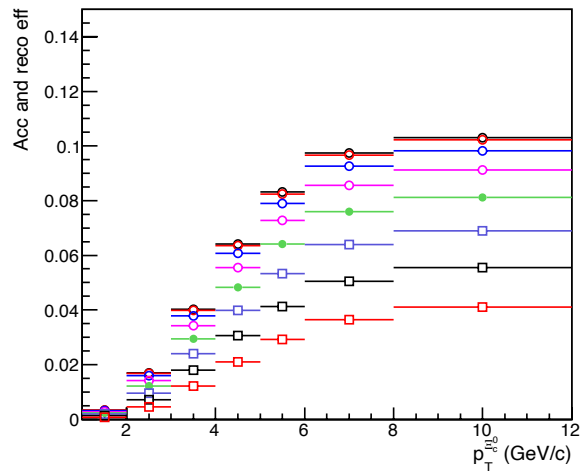
- Clear z -vertex dependence (probably due to variation of tracking efficiency in η ?)



- A small offset in z-vertex between MB and HMV0 events
- z-vertex distribution in MC is in between distributions from MB and HMV0 events
- Very small change with weight as a function of z-vertex



Corrected yield with various eXi mass cuts

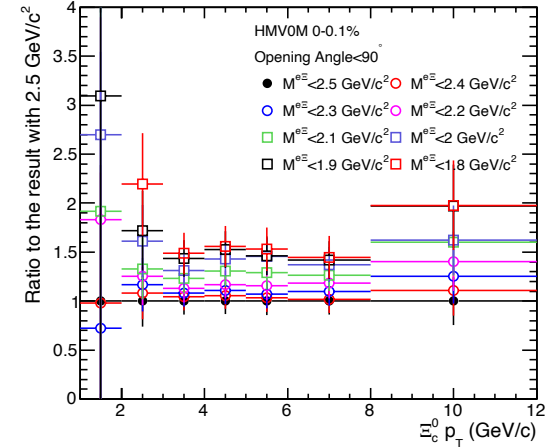
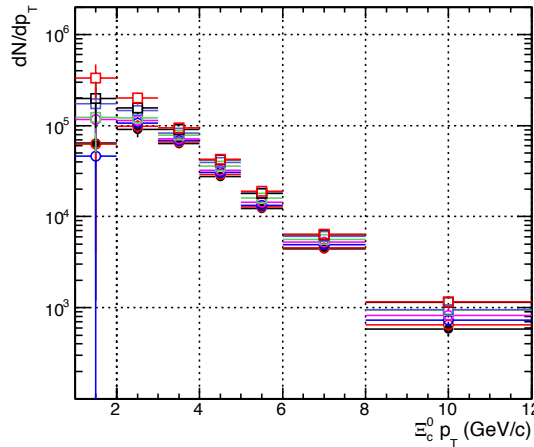
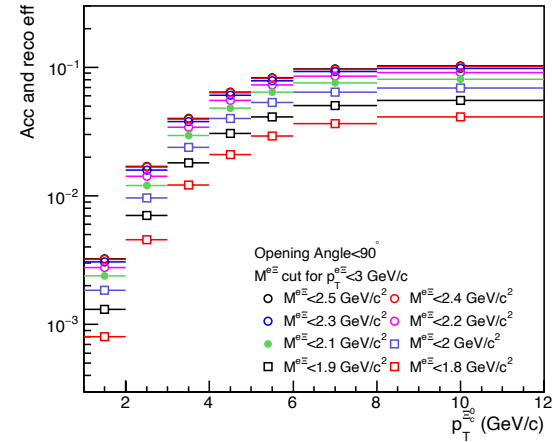
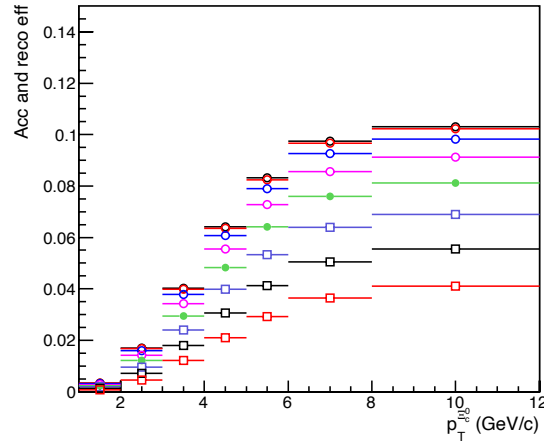


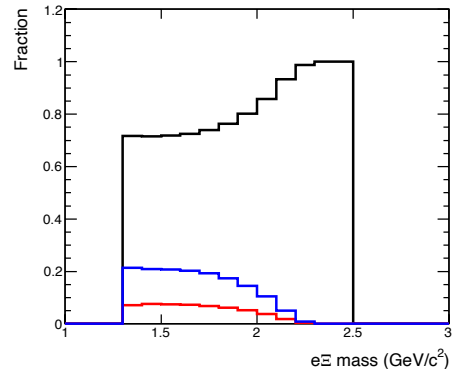
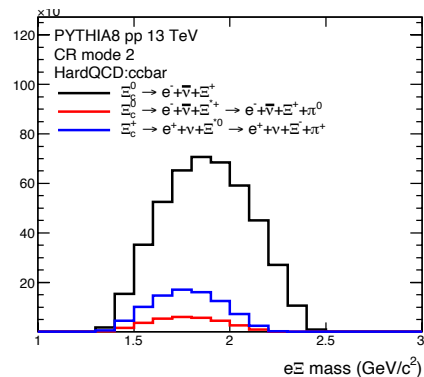
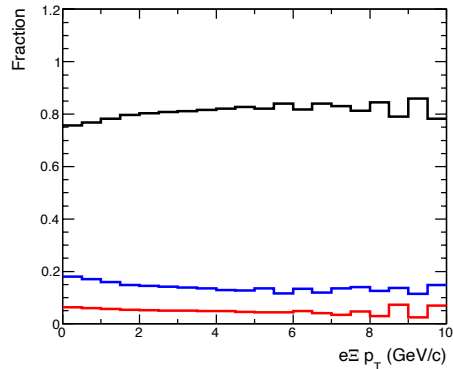
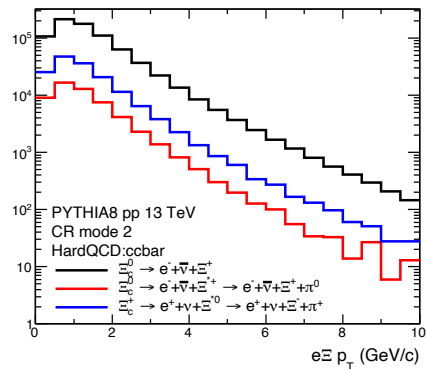
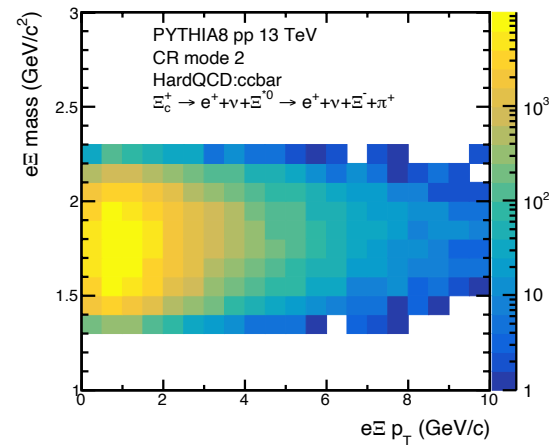
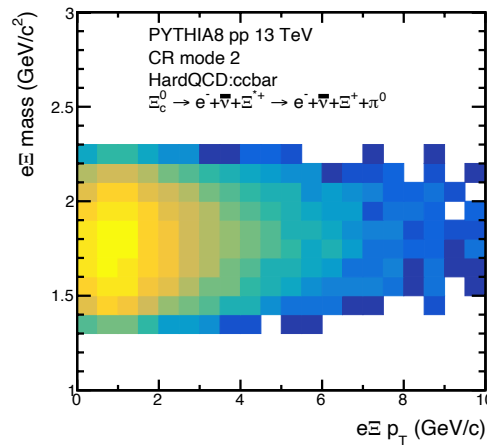
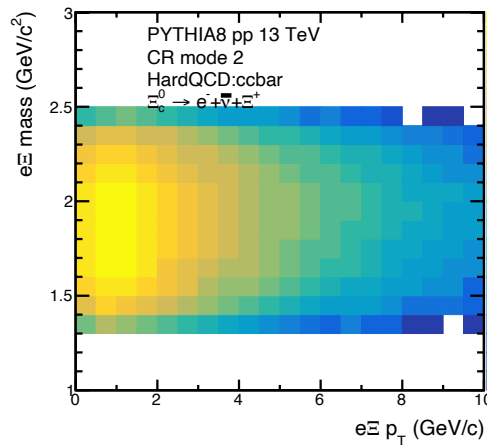
Corrected yield with various eXi mass cuts

- Clear difference with different eXi mass cut
- MC for efficiency calculation
Xi c0 → e nu Xi (forced decay)
- In PYTHIA8

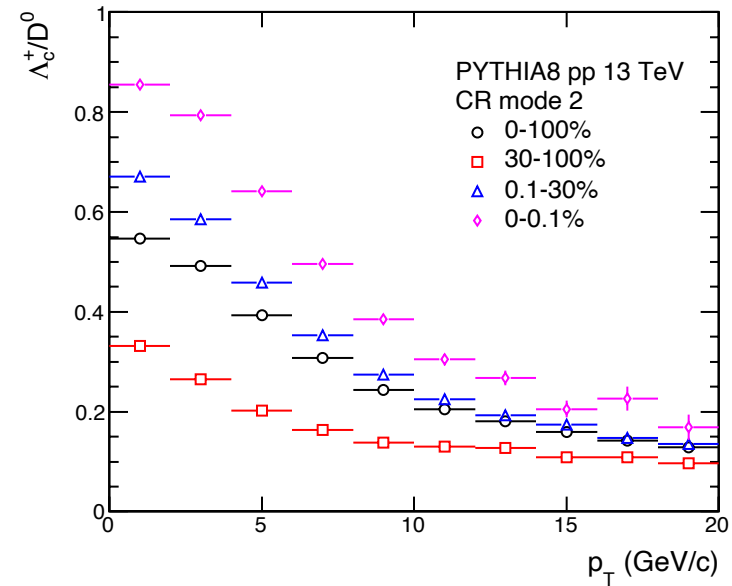
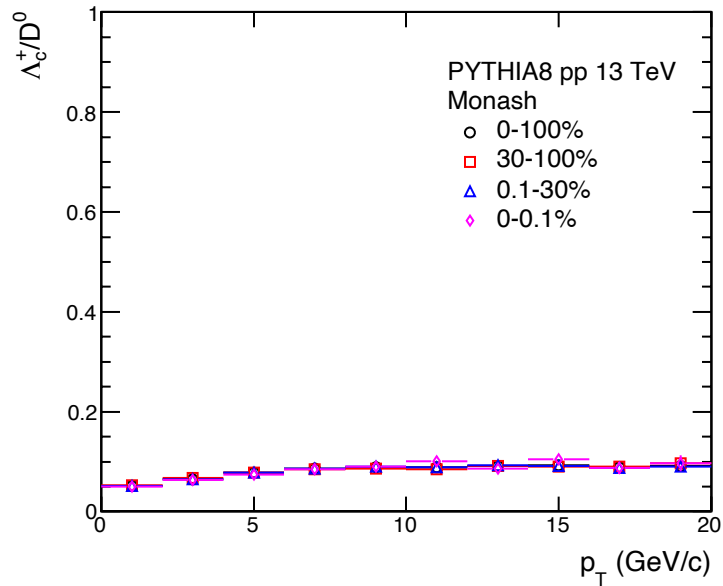
4132	Xi_c0		Xi_cbar0	2	0	0	2.47088	0.00000
0	0	0.0200000	22	-11	12	3	3101	
1	0	0.0050000	22	-11	12	3	3103	
2	0	0.0200000	22	-13	14	3	3101	
3	0	0.0050000	22	-13	14	3	3103	
4	0	0.5400000	42	2	-1	3	3101	
5	0	0.2100000	42	3	3201			
6	0	0.1000000	42	3	3203			
7	0	0.1000000	42	2	3303			
4232	Xi_c+		Xi_cbar-	2	3	0	2.46780	0.00000
0	0	0.0280000	22	-11	12	3	3201	
1	0	0.0070000	22	-11	12	3	3203	
2	0	0.0280000	22	-13	14	3	3201	
3	0	0.0070000	22	-13	14	3	3203	
4	0	0.9300000	42	2	-1	3	3201	

3101: (sd)₀
 3103: (sd)₁
 3201: (su)₀
 3203: (su)₁





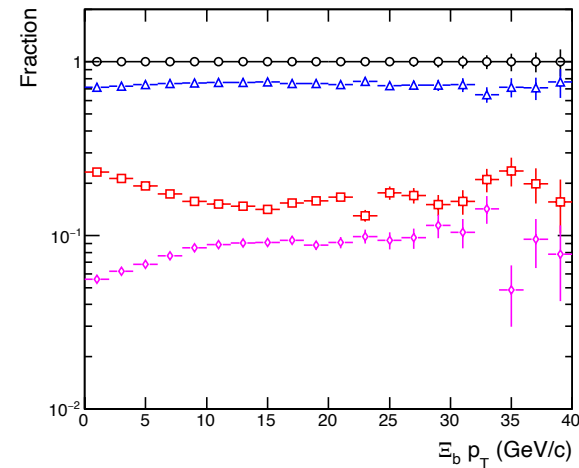
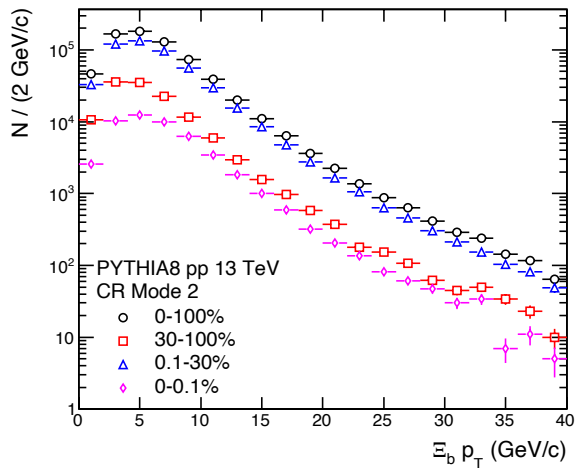
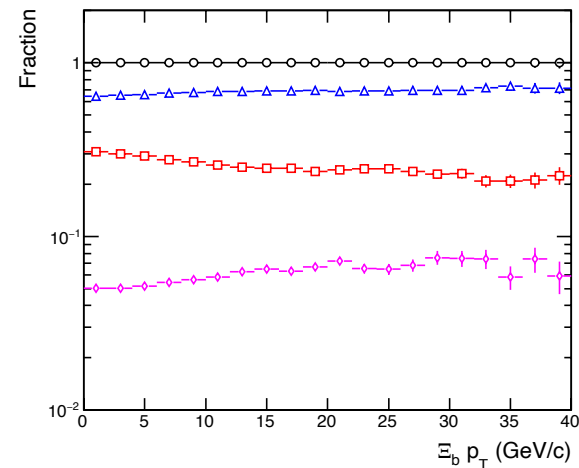
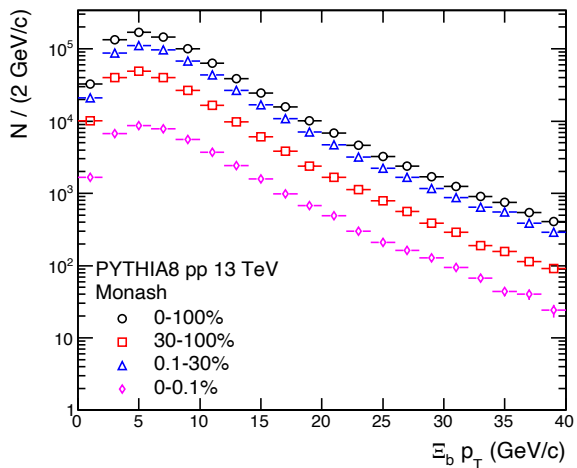
- Lc/D0 ratio in PYTHIA
- Confirmation of CR mode 2 configuration



- Fraction of Xib in various multiplicity bins (multiplicity at VOM acceptance)

- Monash:
 - 0-0.1% VOM: 5.5%
 - 0.1-30% VOM: 66.7%
 - 30-100% VOM: 27.8%

- CR mode 2:
 - 0-0.1% VOM: 7.2%
 - 0.1-30% VOM: 74.0%
 - 30-100% VOM: 18.8%



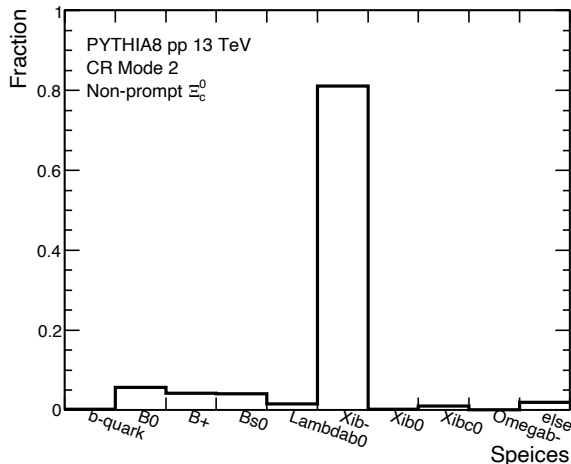
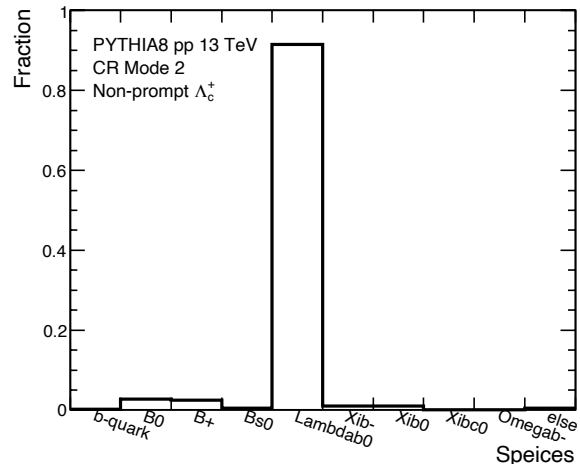
- b-quark cross section vs. p_T from FONLL
- Scale with $BR(b \rightarrow \Lambda_b^0)BR(\Lambda_b^0 \rightarrow \Lambda_c^+)$ and apply the 2D response matrix for p_T smearing of $\Lambda_b^0 \rightarrow \Lambda_c^+$ ($b p_T \rightarrow \Lambda_b^0 p_T$)
 → obtain non-prompt Λ_c^+ cross section vs. p_T (explicitly, Λ_c^+ from Λ_b^0)
- Cross section of $\Lambda_c^+ \rightarrow pK\pi$ from b-hadron
- Scale with $BR(\Lambda_c^+ \rightarrow pK\pi)$ (scale factor is $1e-6/(0.068*20)$, '20' is dp_T (bin width))
 → obtain non-prompt Λ_c^+ cross section vs. p_T
- Scale with the yield ratio $\frac{\text{inclusive } \Xi_c^0}{\text{prompt } \Lambda_c^+} \approx \frac{\text{inclusive } \Xi_c^0}{\text{inclusive } \Lambda_c^+}$
 (Q. additional correction for $\frac{\text{non-prompt } \Xi_c^0}{\text{non-prompt } \Lambda_c^+}$? A. 0.616)
 → obtain non-prompt Ξ_c^0 cross section vs. p_T

$$\Lambda_b^0 \times \frac{\Lambda_b^0 \rightarrow \Lambda_c^+}{\Lambda_b^0} \times \frac{\frac{\Xi_b^- \rightarrow \Xi_c^0}{\Xi_b^-}}{\frac{\Lambda_b^0 \rightarrow \Lambda_c^+}{\Lambda_b^0}} = \Lambda_b^0 \times \frac{\Xi_b^- \rightarrow \Xi_c^0}{\Xi_b^-}$$

- Scale with the efficiency for inclusive and non-prompt Ξ_c^0 (gen level → reco level)
 → obtain the spectra of reconstructed inclusive and non-prompt Ξ_c^0

BRs check for $B \rightarrow \Xi_c^0$ and $B \rightarrow \Lambda_c^+$

- Hb → Lc + X BRs in PYTHIA8:
 - B0 → Lc++ + X = 0.0184059 (ignore)
 - B+ → Lc++ + X = 0.0169298 (ignore)
 - Bs → Lc++ + X = 0.0195037 (ignore)
 - Lb → Lc++ + X = 0.819539 (dominate)
- Hb → Xic0 + X BRs in PYTHIA8:
 - B0 → Xic0 + X = 0.00267 (ignore)
 - B+ → Xic0 + X = 0.002089 (ignore)
 - Bs → Xic0 + X = 0.0126 (ignore)
 - Lb → Xic0 + X = 0.00094 (ignore)
 - Xib0 → Xic0 + X = 0.00104 (ignore)
 - Xib- → Xic0 + X = 0.505056 (dominate)
- $BR(\Xi_b^- \rightarrow \Xi_c^0)/BR(\Lambda_b \rightarrow \Lambda_c^+) = 50.5\% / 82.0\% = 0.616$

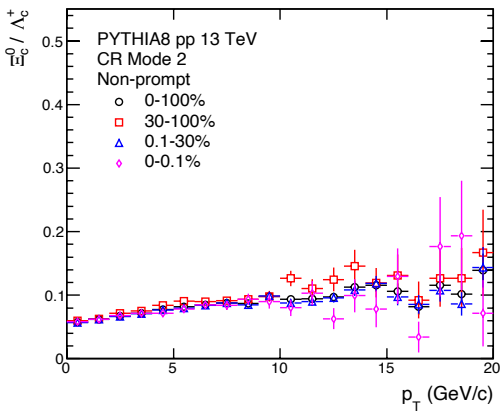
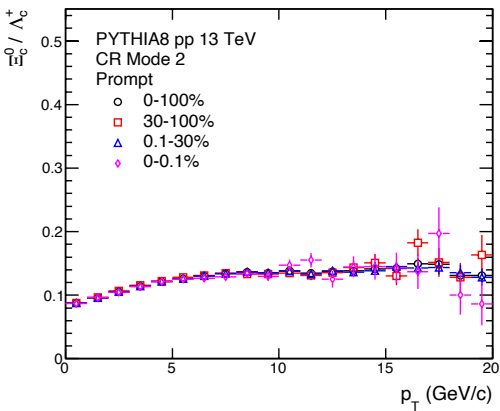
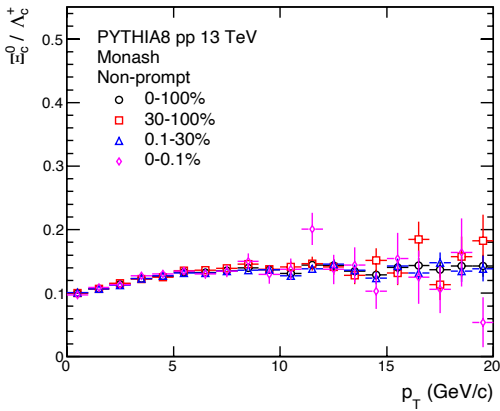
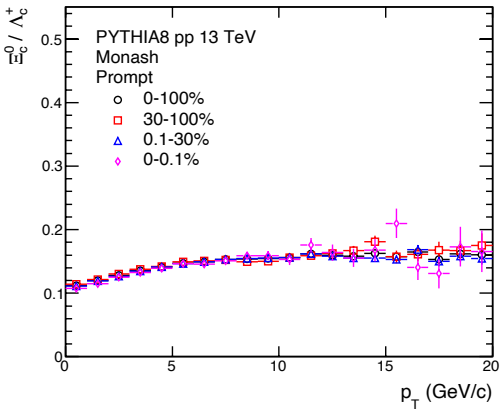


- BRs check for $B \rightarrow \Xi_c^0$ and $B \rightarrow \Lambda_c^+$**
- $H_b \rightarrow Lc + X$ BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Lc^{+-} + X = 0.0184059$ (ignore)
 - ➔ $B+ \rightarrow Lc^{+-} + X = 0.0169298$ (ignore)
 - ➔ $Bs \rightarrow Lc^{+-} + X = 0.0195037$ (ignore)
 - ➔ $Lb \rightarrow Lc^{+-} + X = 0.819539$ (dominate)
 - $H_b \rightarrow Xic0 + X$ BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Xic0 + X = 0.00267$ (ignore)
 - ➔ $B+ \rightarrow Xic0 + X = 0.002089$ (ignore)
 - ➔ $Bs \rightarrow Xic0 + X = 0.0126$ (ignore)
 - ➔ $Lb \rightarrow Xic0 + X = 0.00094$ (ignore)
 - ➔ $Xib0 \rightarrow Xic0 + X = 0.00104$ (ignore)
 - ➔ $Xib- \rightarrow Xic0 + X = 0.505056$ (dominate)
 - $BR(\Xi_b^- \rightarrow \Xi_c^0) / BR(\Lambda_b \rightarrow \Lambda_c^+) = 50.5\% / 82.0\% = 0.616$

- No multiplicity dependence in Xic0/Lc
- Monash
Similar ratio for prompt and non-prompt
- CR mode 2
Slightly lower ratio than Monash

BRs check for $B \rightarrow \Xi_c^0$ and $B \rightarrow \Lambda_c^+$

- Hb \rightarrow Lc + X BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Lc^{+-} + X = 0.0184059$ (ignore)
 - ➔ $B+ \rightarrow Lc^{+-} + X = 0.0169298$ (ignore)
 - ➔ $Bs \rightarrow Lc^{+-} + X = 0.0195037$ (ignore)
 - ➔ $Lb \rightarrow Lc^{+-} + X = 0.819539$ (dominate)
- Hb \rightarrow Xic0 + X BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Xic0 + X = 0.00267$ (ignore)
 - ➔ $B+ \rightarrow Xic0 + X = 0.002089$ (ignore)
 - ➔ $Bs \rightarrow Xic0 + X = 0.0126$ (ignore)
 - ➔ $Lb \rightarrow Xic0 + X = 0.00094$ (ignore)
 - ➔ $Xib0 \rightarrow Xic0 + X = 0.00104$ (ignore)
 - ➔ $Xib- \rightarrow Xic0 + X = 0.505056$ (dominate)
- $BR(\Xi_b^- \rightarrow \Xi_c^0) / BR(\Lambda_b \rightarrow \Lambda_c^+) = 50.5\% / 82.0\% = 0.616$



- Small multiplicity dependence at low pT in Monash
- Slightly lower prompt fraction in CR mode2

BRs check for $B \rightarrow \Xi_c^0$ and $B \rightarrow \Lambda_c^+$

- $H_b \rightarrow Lc + X$ BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Lc^{+-} + X = 0.0184059$ (ignore)
 - ➔ $B+ \rightarrow Lc^{+-} + X = 0.0169298$ (ignore)
 - ➔ $Bs \rightarrow Lc^{+-} + X = 0.0195037$ (ignore)
 - ➔ $Lb \rightarrow Lc^{+-} + X = 0.819539$ (dominate)
- $H_b \rightarrow Xic0 + X$ BRs in PYTHIA8:
 - ➔ $B0 \rightarrow Xic0 + X = 0.00267$ (ignore)
 - ➔ $B+ \rightarrow Xic0 + X = 0.002089$ (ignore)
 - ➔ $Bs \rightarrow Xic0 + X = 0.0126$ (ignore)
 - ➔ $Lb \rightarrow Xic0 + X = 0.00094$ (ignore)
 - ➔ $Xib0 \rightarrow Xic0 + X = 0.00104$ (ignore)
 - ➔ $Xib- \rightarrow Xic0 + X = 0.505056$ (dominate)
- $BR(\Xi_b^- \rightarrow \Xi_c^0) / BR(\Lambda_b \rightarrow \Lambda_c^+) = 50.5\% / 82.0\% = 0.616$

