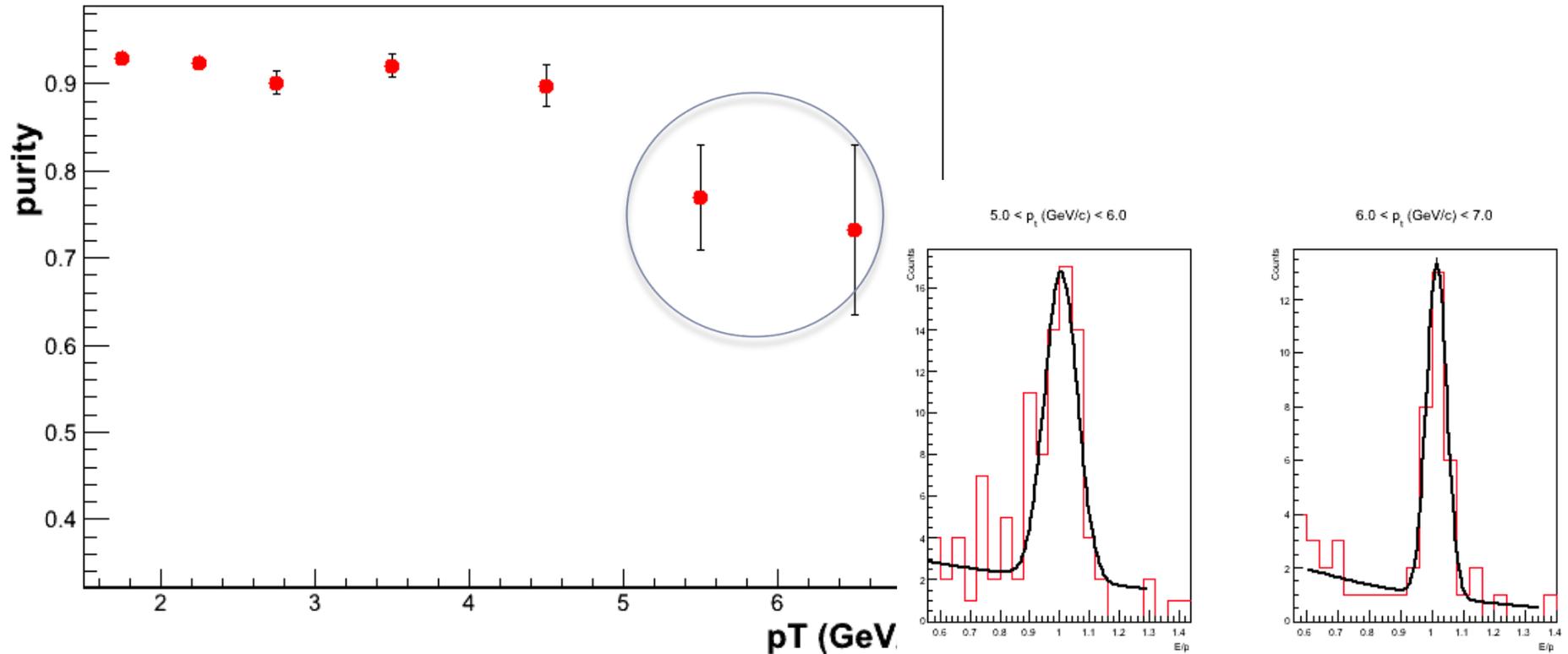


HFE with EMCAL

Shingo Sakai

Hadron contamination @ high p_T

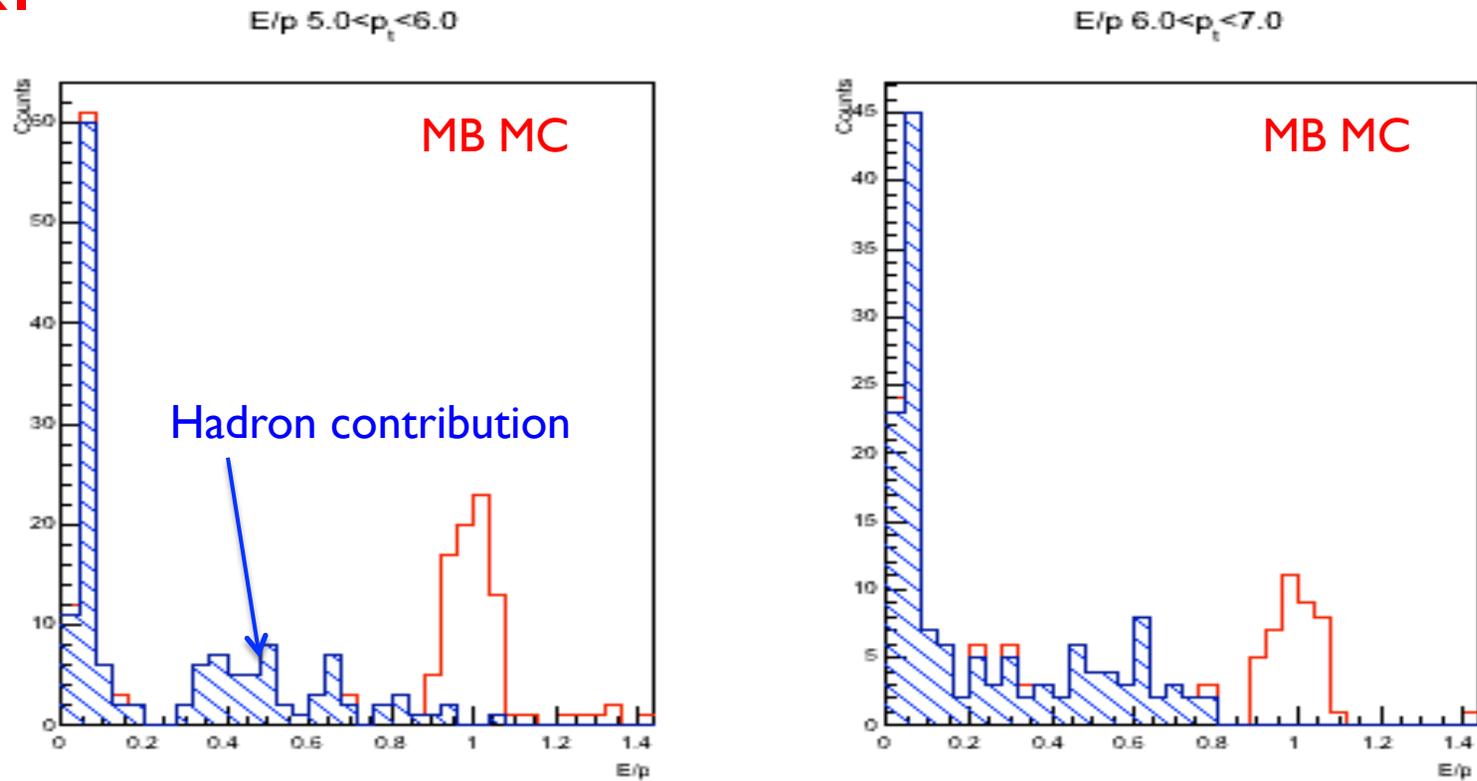
Graph



- E/p fit with Gaussian + exponent was failed due to limited statistics @ high p_T
- Checked the contamination with some methods

Hadron contamination @ high pT

Check I

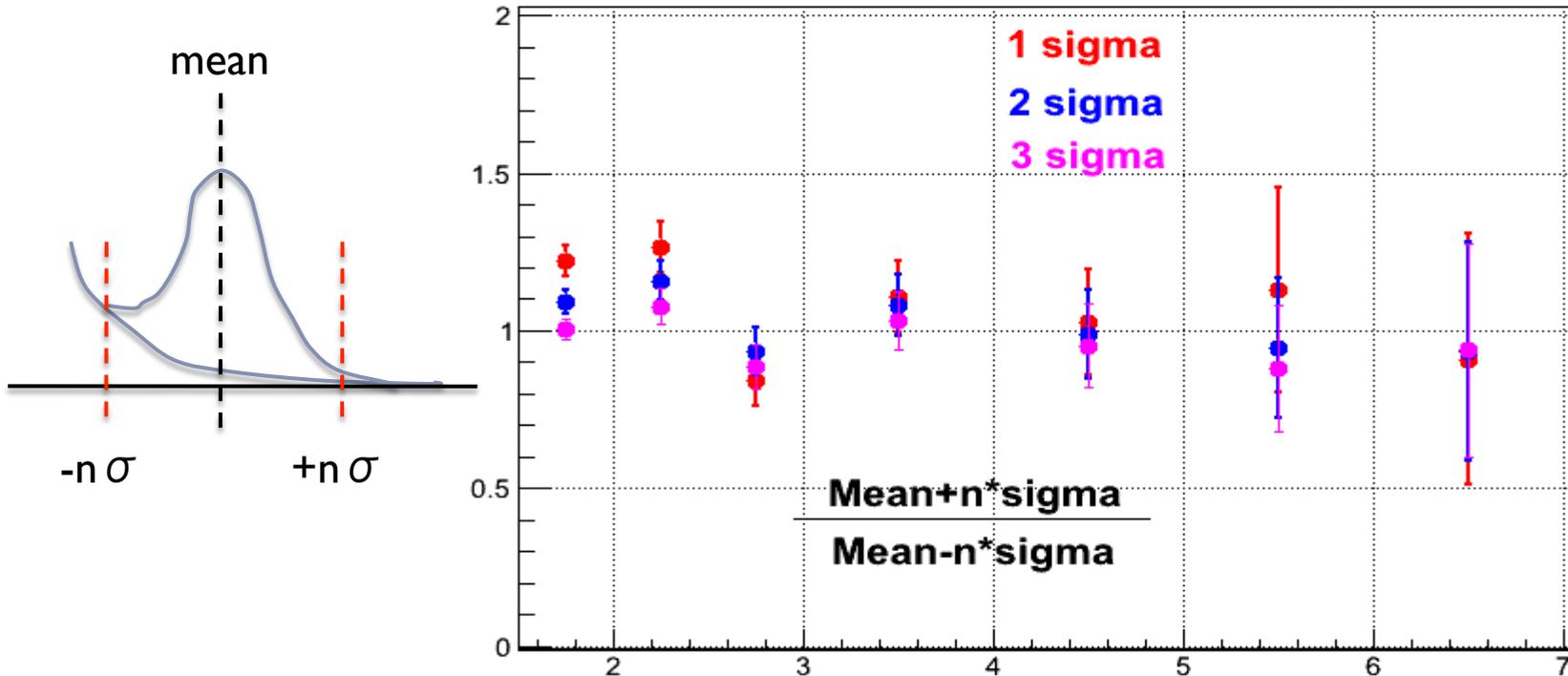


- E/p distribution from MB MC sample
- Very small contamination @ high pT but limited statistics

Hadron contamination @ high pT

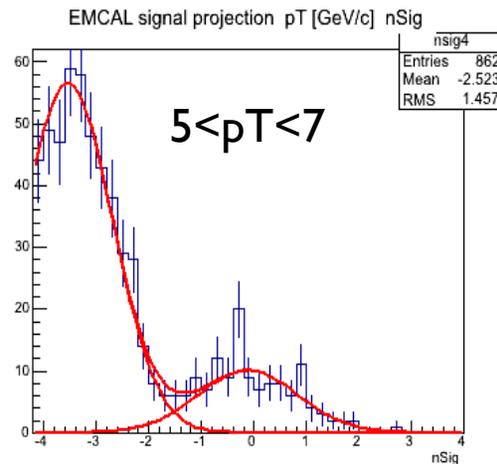
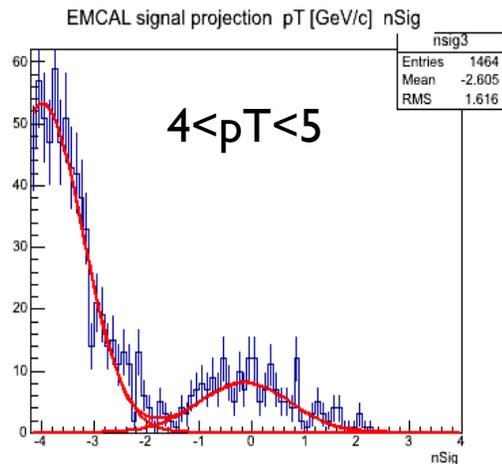
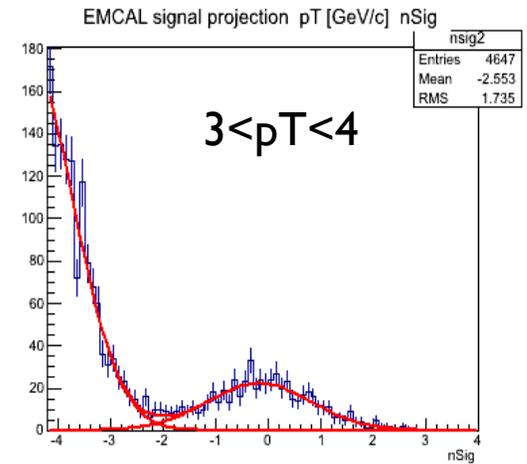
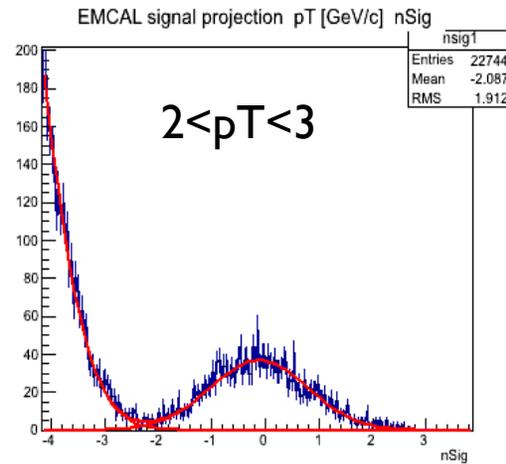
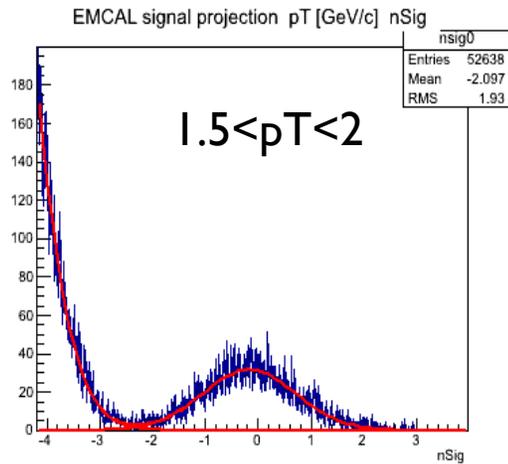
Check2

Graph



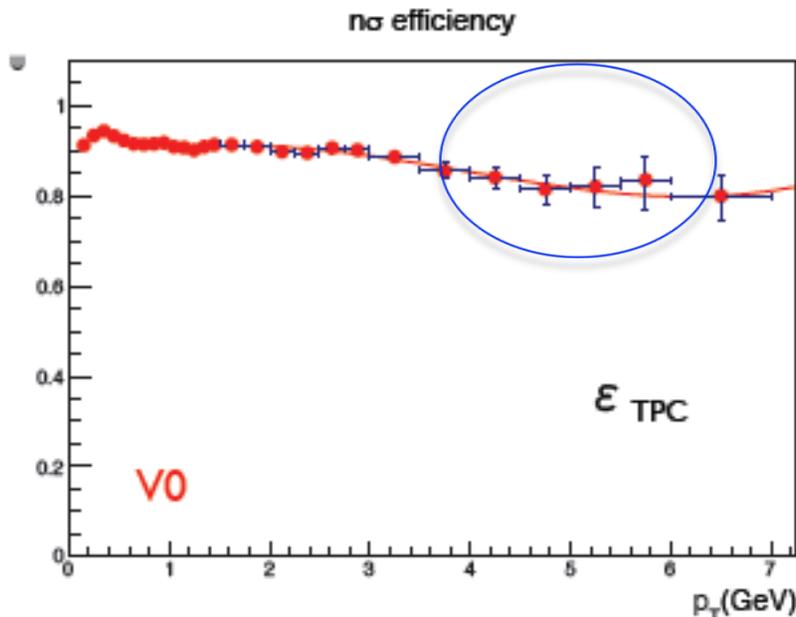
- Compared yield $\text{mean}+n\sigma$ & $\text{mean} - n\sigma$
- < 1 ; due to hadron contamination
- High pT ; same level as low pT
- high pT contamination ; extrapolated from low pT
- 7 % +/- 5 %

Efficiency from TPC nsigma cut



Checked TPC nsigma
Efficiency by using
The distribution

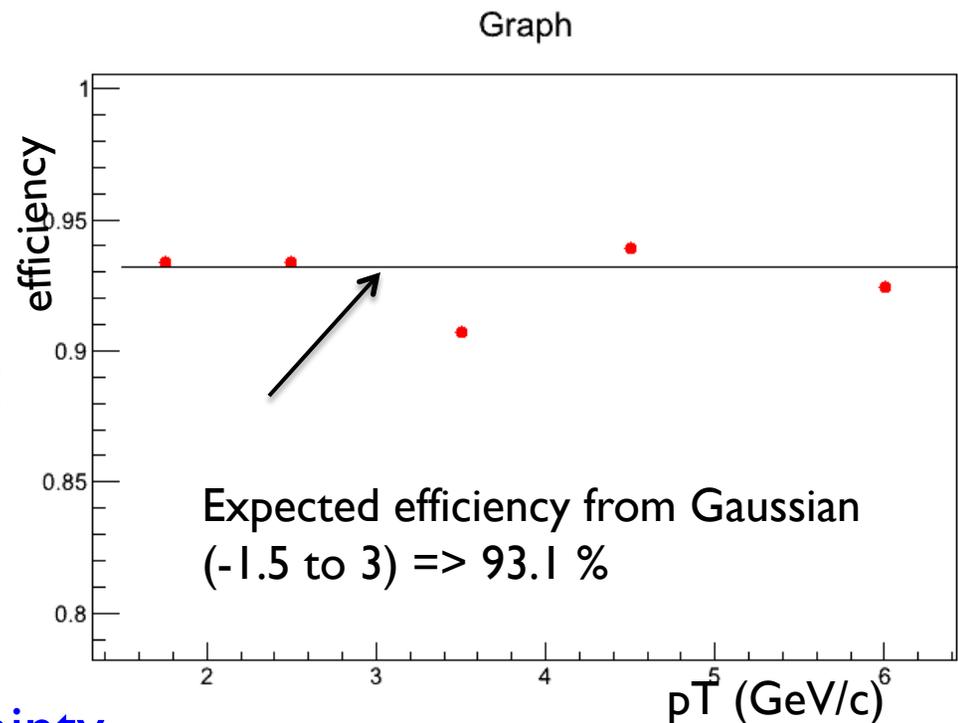
Efficiency from TPC nsigma cut



Checked the efficiency using
nSigma dE/dx distribution
(previous slides)

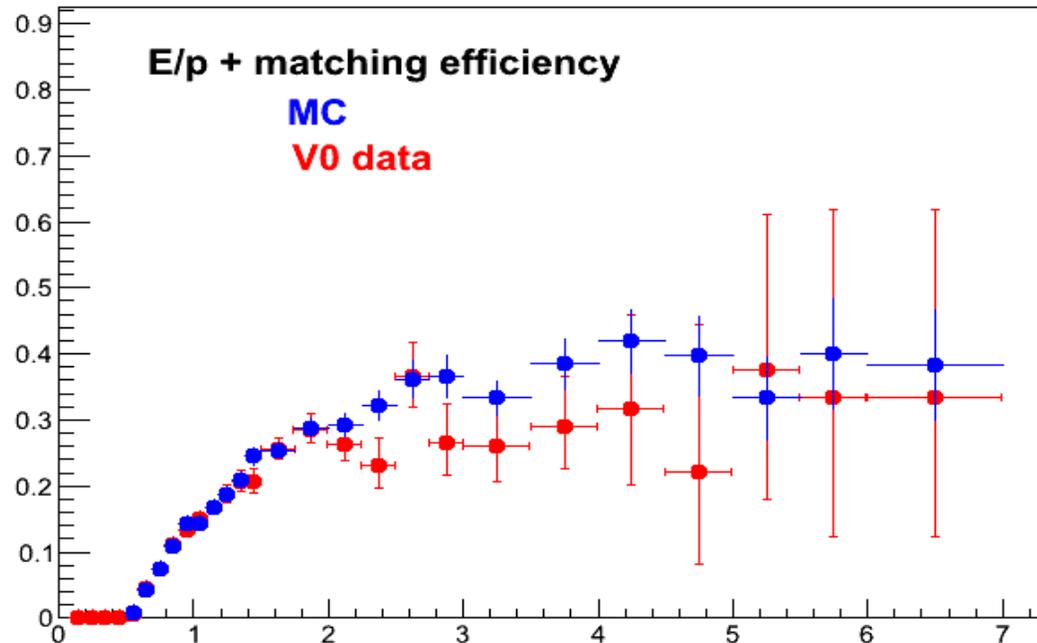
➔ Now we use 93.1 (const)
Give $\pm 3\%$ as the uncertainty

Previous analysis used V0 efficiency
=> high p_T drop
(due to hadron contamination)



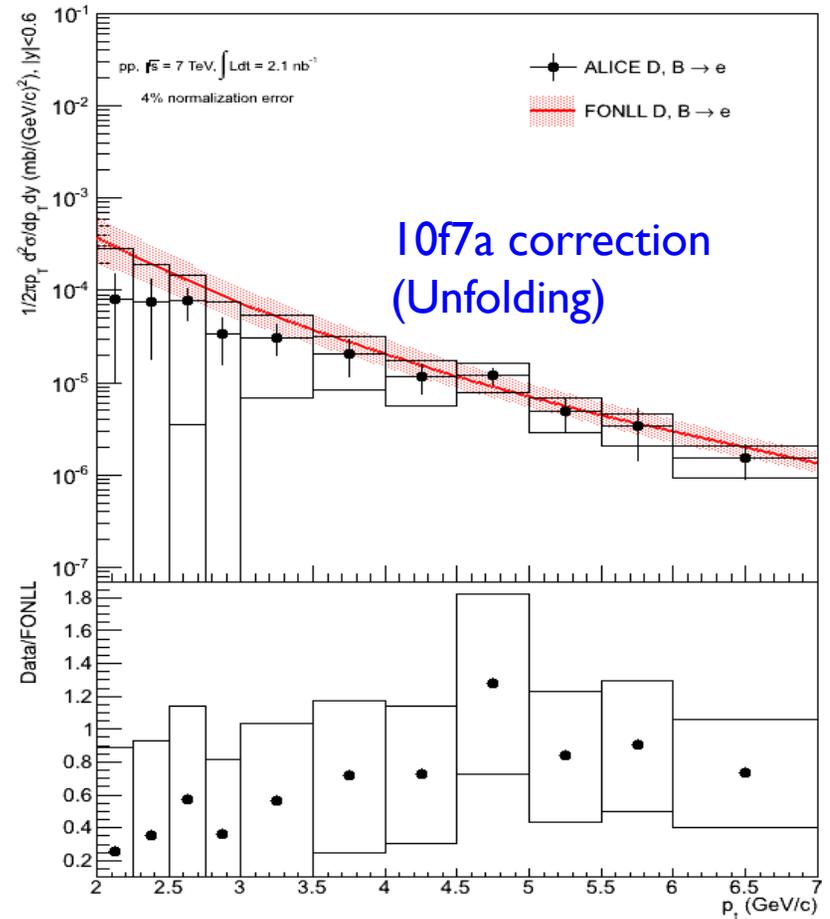
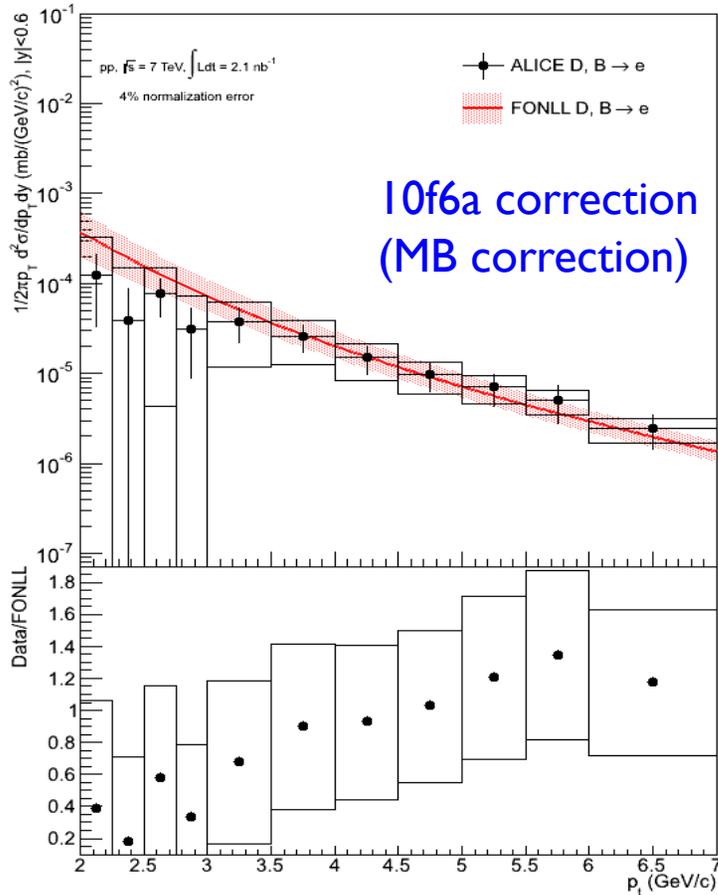
Electron selection efficiency with EMCal

: projection on p_T



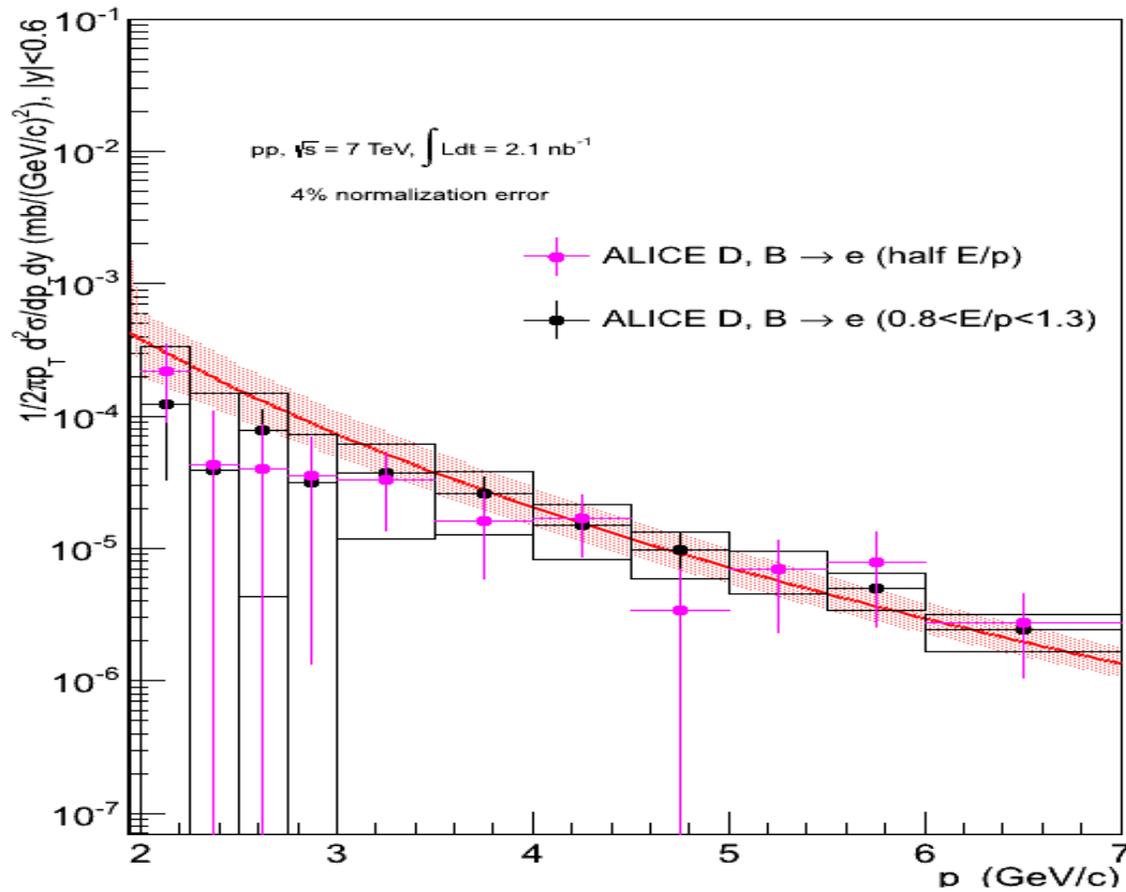
- Took half of E/p ($E/p > \text{mean}$) ; pure electron sample
- High p_T ; V0 efficiency is lower than MC (same as dE/dx nsigma)
 - hadron contamination in denominator (after TPC nSigma cut)
- Low p_T ; consistent with each other
- use MC for the efficiency calculation

HFE spectrum



- MB correction => same as TOF+TPC+TRD
- small statistics for EMCal
- 10f7a more statistics (but have problem to use ?)

HFE spectrum

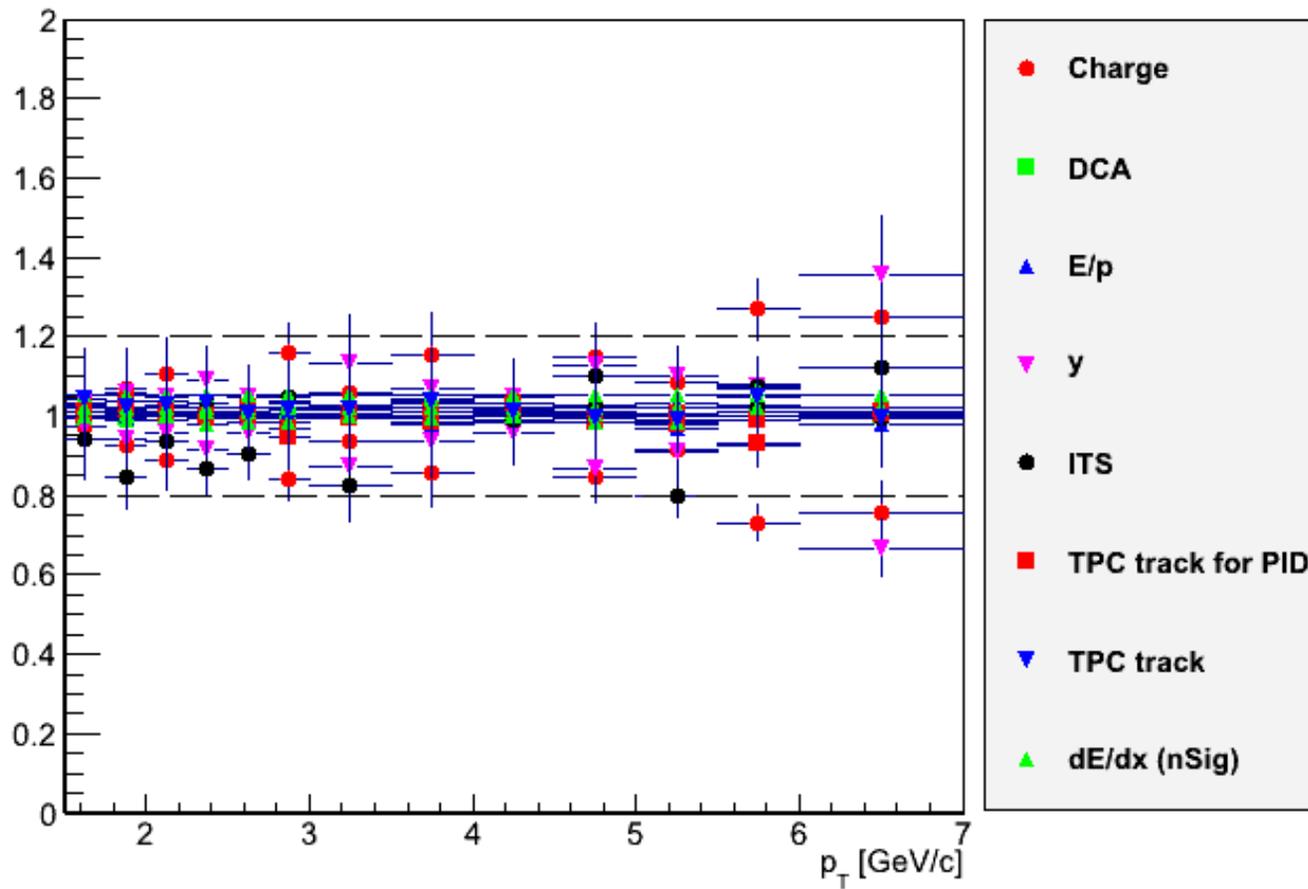


- Compare with half E/p selection

Systematic uncertainties

- ▶ ITS clusters ; 10%
- ▶ TPC clusters ; 4 %
- ▶ TPC clusters for PID ; 2 %
- ▶ TPC PID ; 5 %
- ▶ E/p ; 8 % (E/p cut + hadron contamination)
- ▶ DCA ; < 1%
- ▶ Charge ; 10 %
- ▶ η ; 10 %
- ▶ Matching ; 2 %
- ▶ Total ; ~ 20%

Systematic uncertainties



Summary

- ▶ Studied hadron contamination @ high p_T with some methods
 - ▶ Extrapolate from low p_T
- ▶ Checked nSigma dE/dx efficiency
 - ▶ Constant @ high p_T
- ▶ E/p efficiency
 - ▶ Dropped @ high p_T ; similar behavior as nSig V0 efficiency
 - ▶ Hadron contamination in denominator
 - ▶ Low p_T is consistent with MC
 - ▶ Use MC efficiency
- ▶ Final cross section



backup



Systematic uncertainties

- ▶ ITS clusters ; 10%
- ▶ TPC clusters ; 4 %
- ▶ TPC clusters for PID ; 2 %
- ▶ TPC PID ; 5 %
- ▶ E/p ; 6 % (E/p cut + hadron contamination)
- ▶ DCA ; < 1%
- ▶ Charge ; 6 %
- ▶ η ; 7 %

