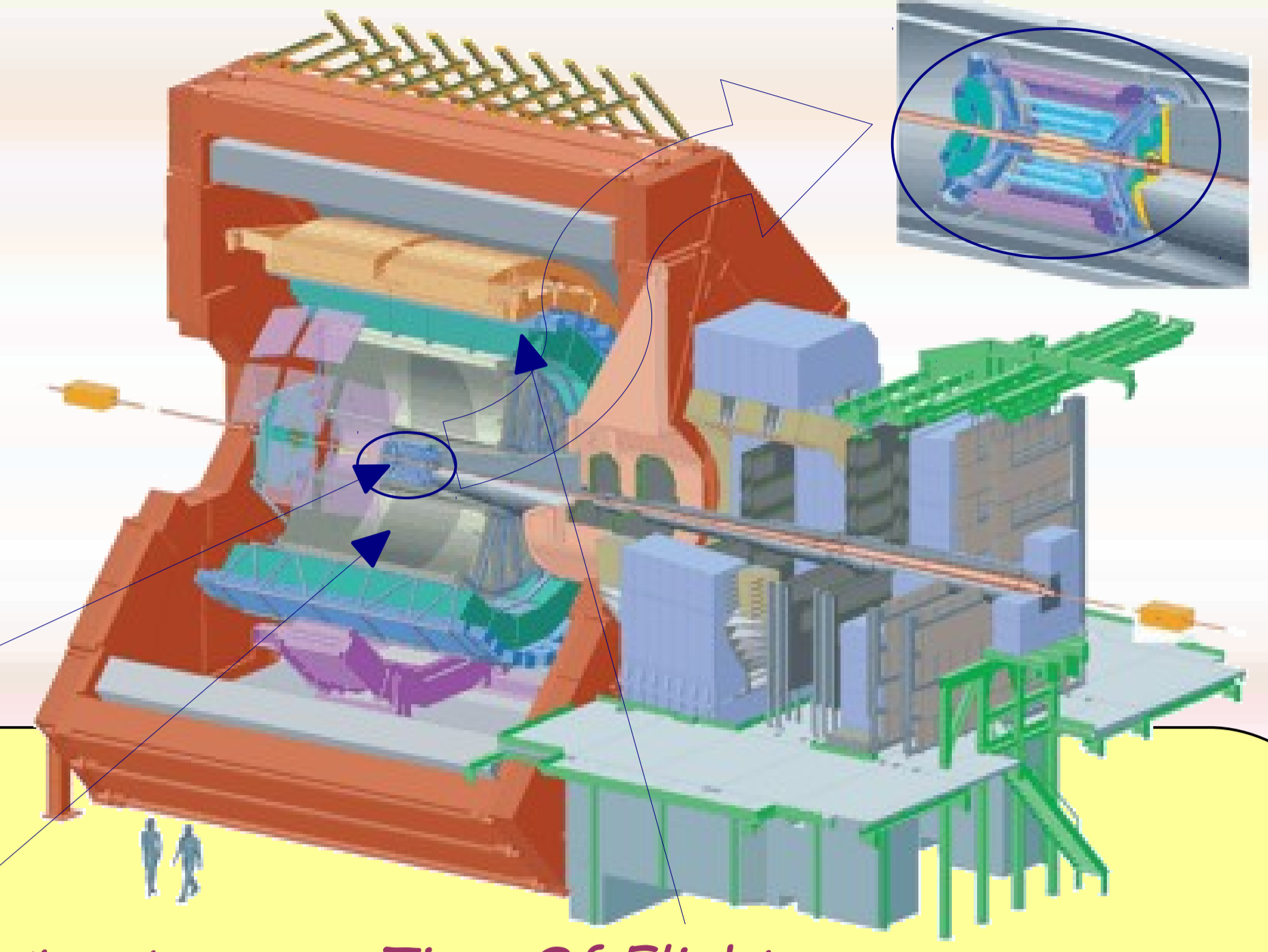
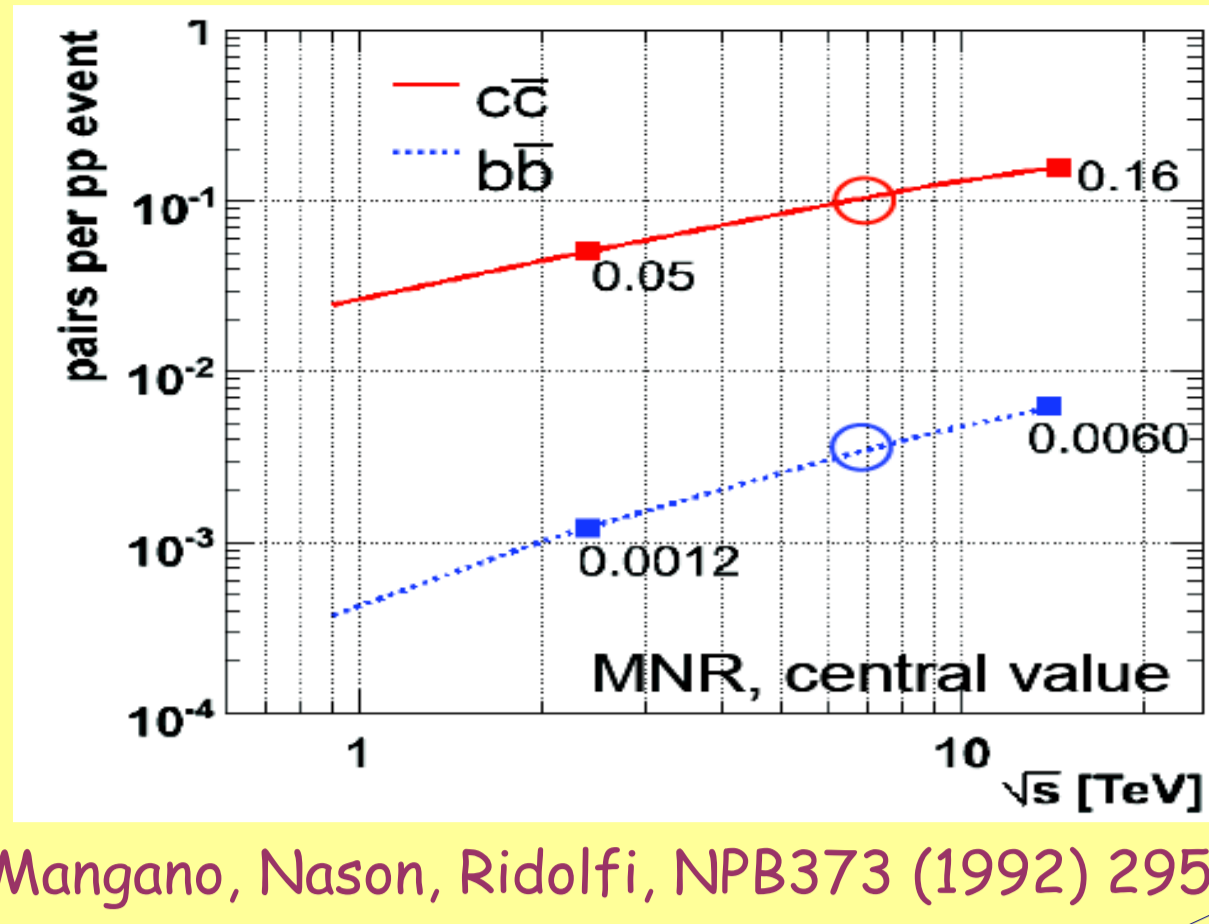
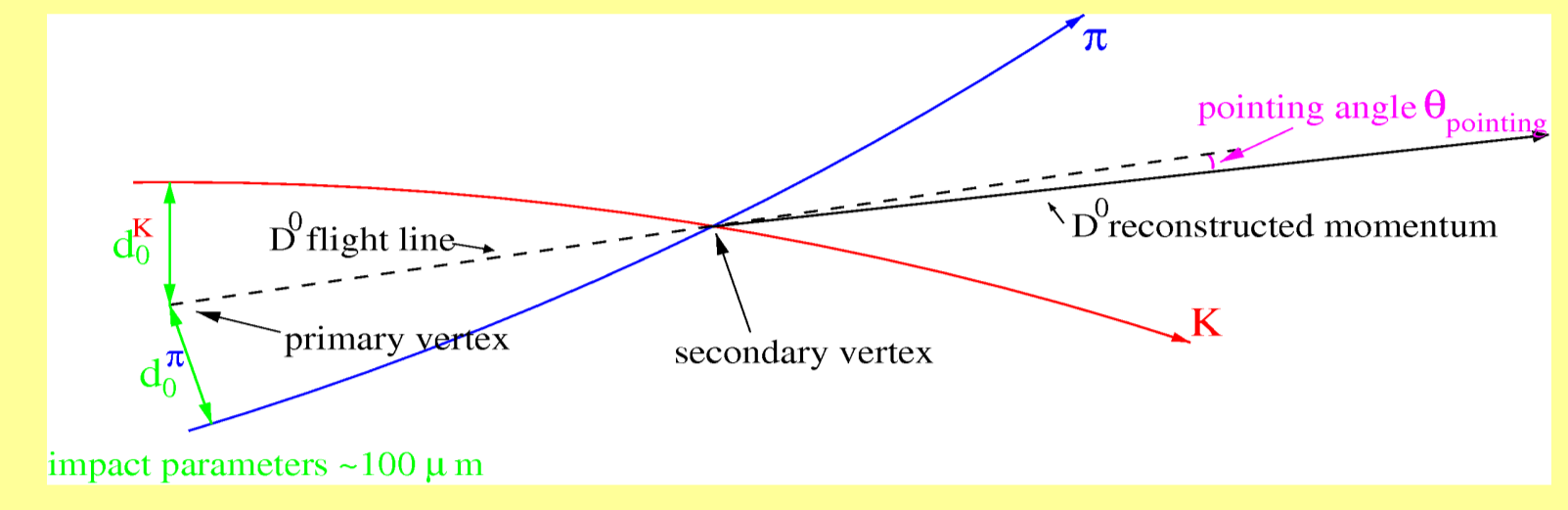


## Heavy flavours in pp collisions with ALICE

- Test pQCD in a new energy domain (3.5-7 x  $\sqrt{s}_{\text{Tevatron}}$ )
- Uncertainty in NLO predictions ~ factor 2
- c and b factory
- Normalization for PbPb HF yield

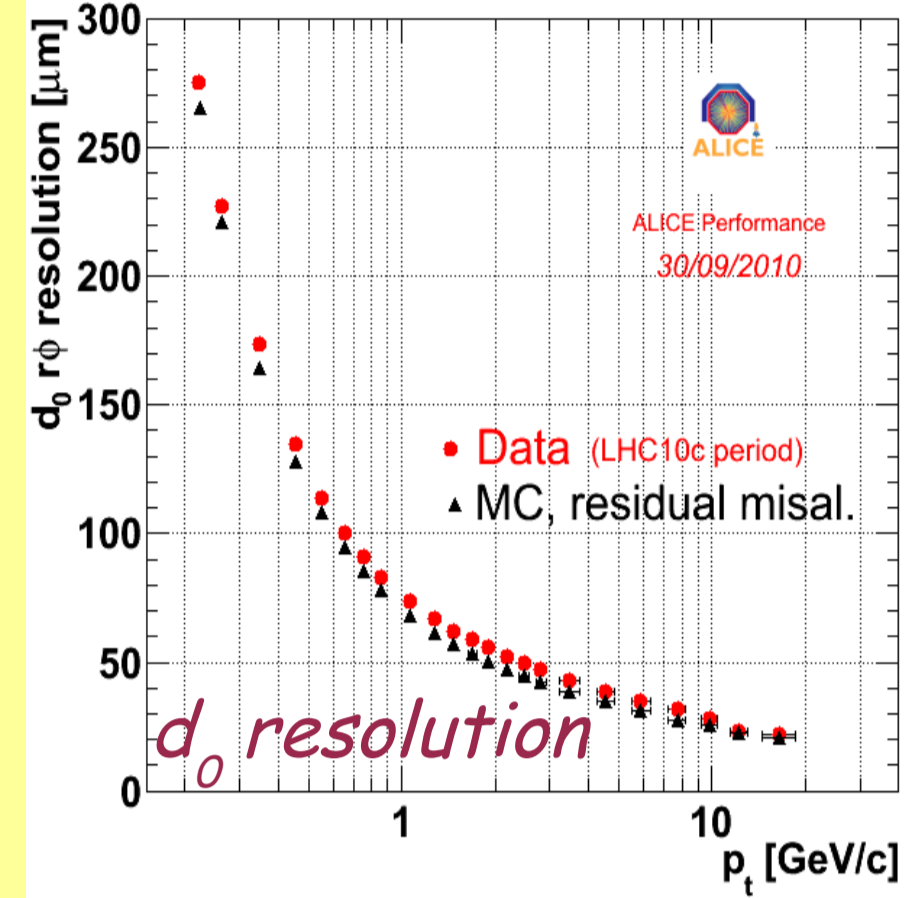


- D<sup>0</sup> mesons are reconstructed in the channel D<sup>0</sup> → K π
- Decay vertex displaced by few 100 μm
- Need good vertex resolution

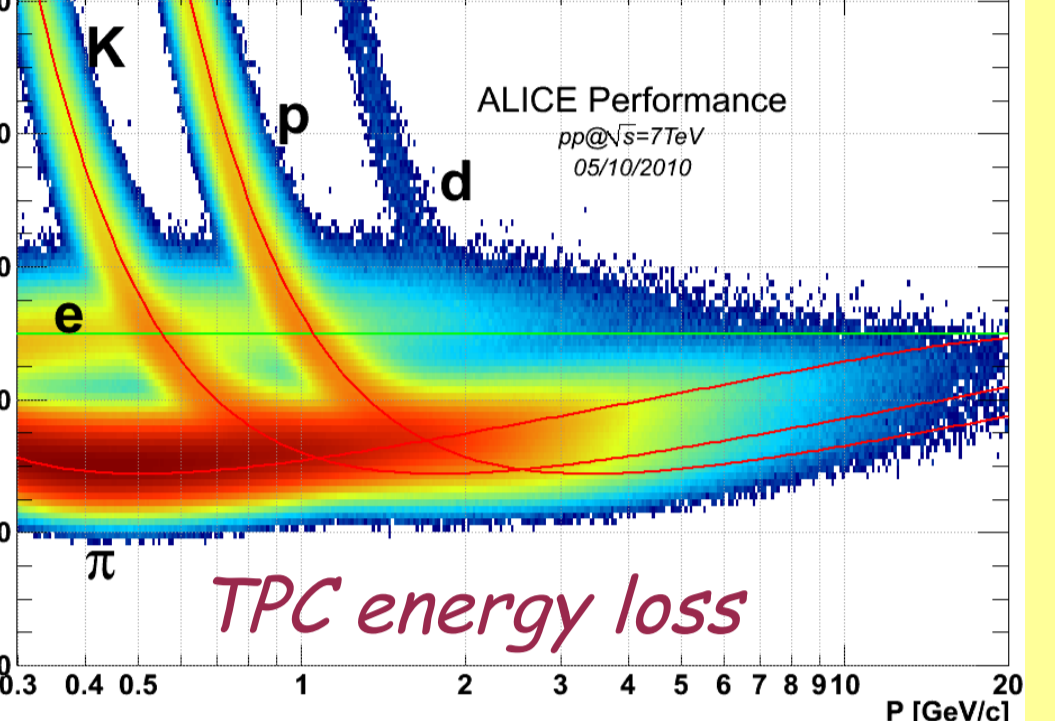


## ALICE detector performance:

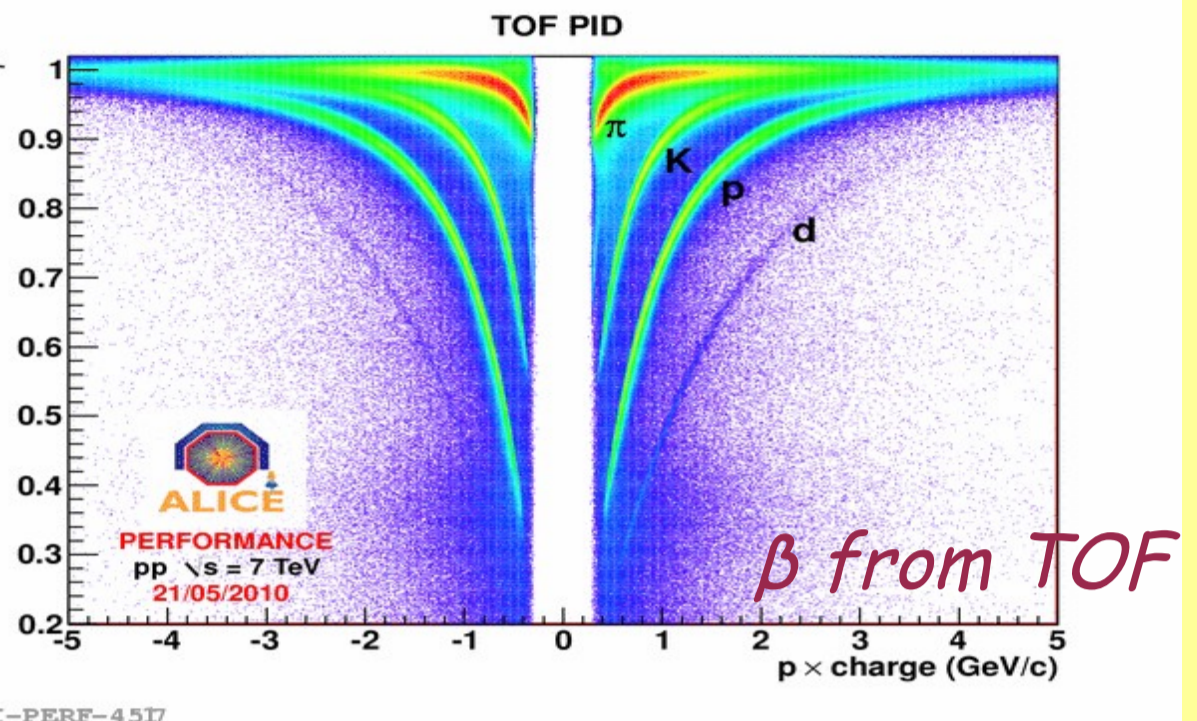
- Inner Tracking System (ITS):
- Vertex reconstruction, low p<sub>t</sub> tracking, PID



## Time Projection Chamber:



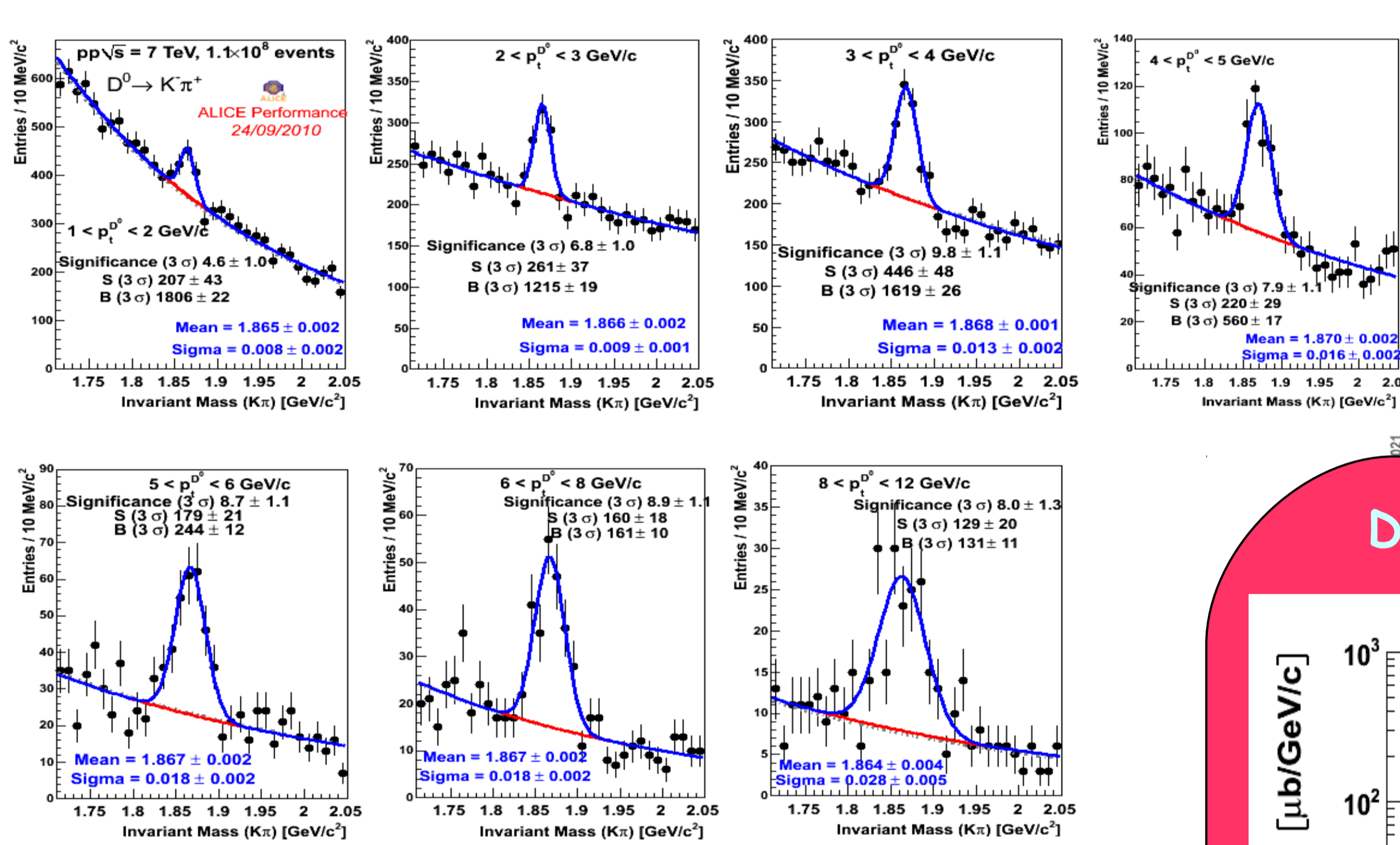
## Time Of Flight:



Combine TPC&TOF for K identification → low p<sub>t</sub> background rejection

## Signal extraction

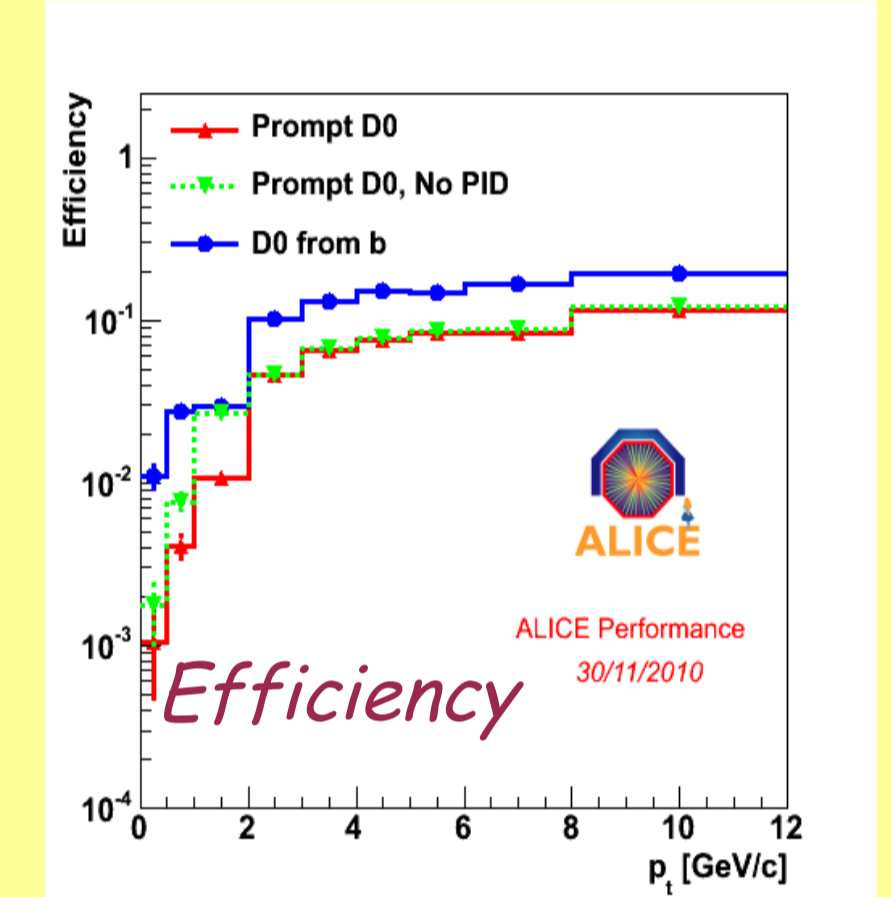
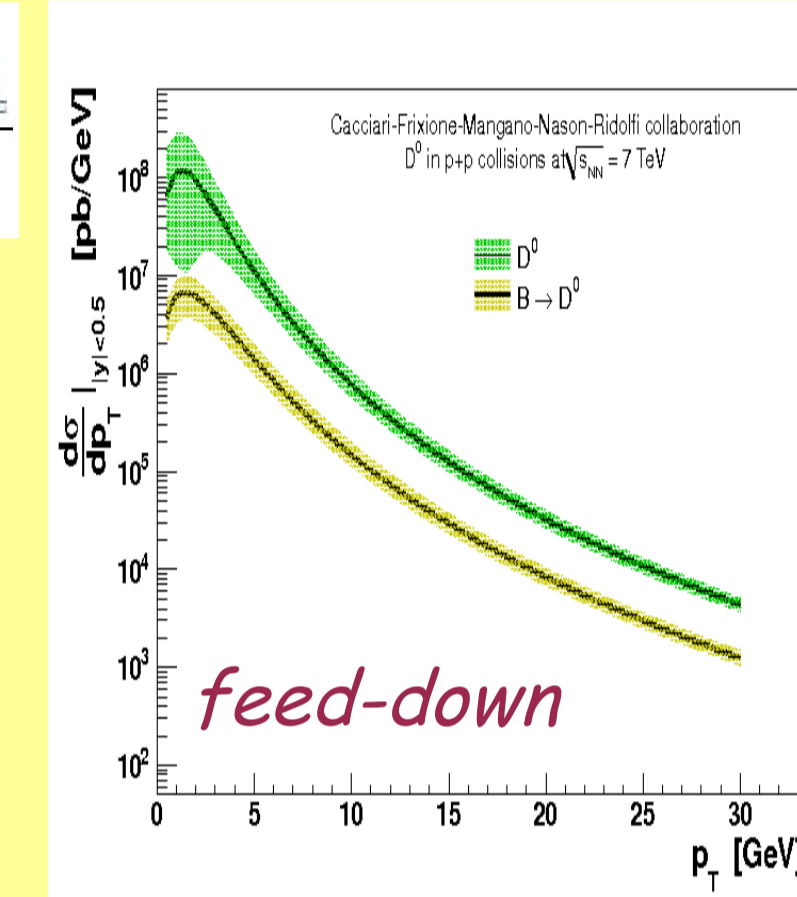
- Topological cuts and PID to reduce combinatorial pairs
- Fit of the invariant mass spectra



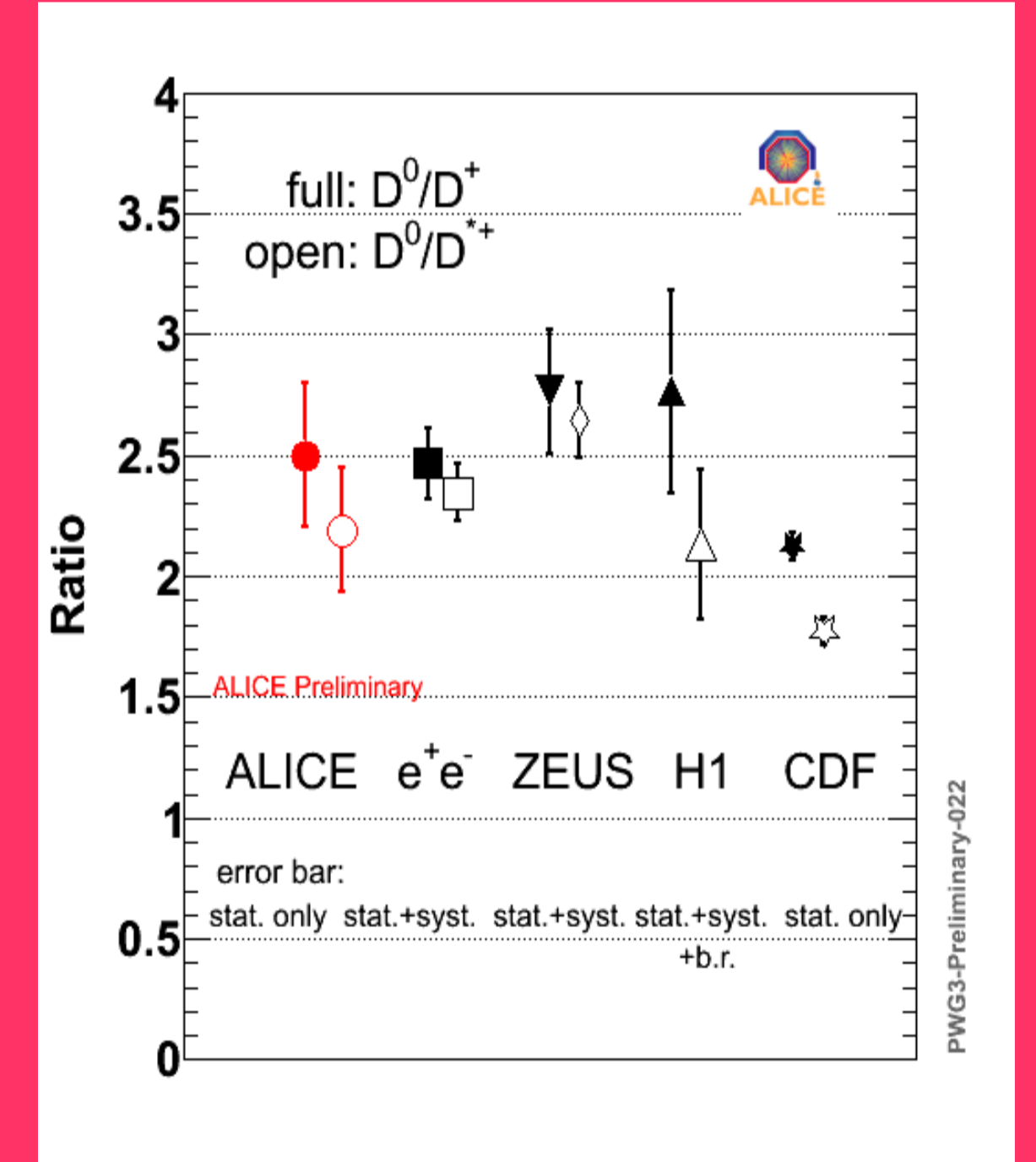
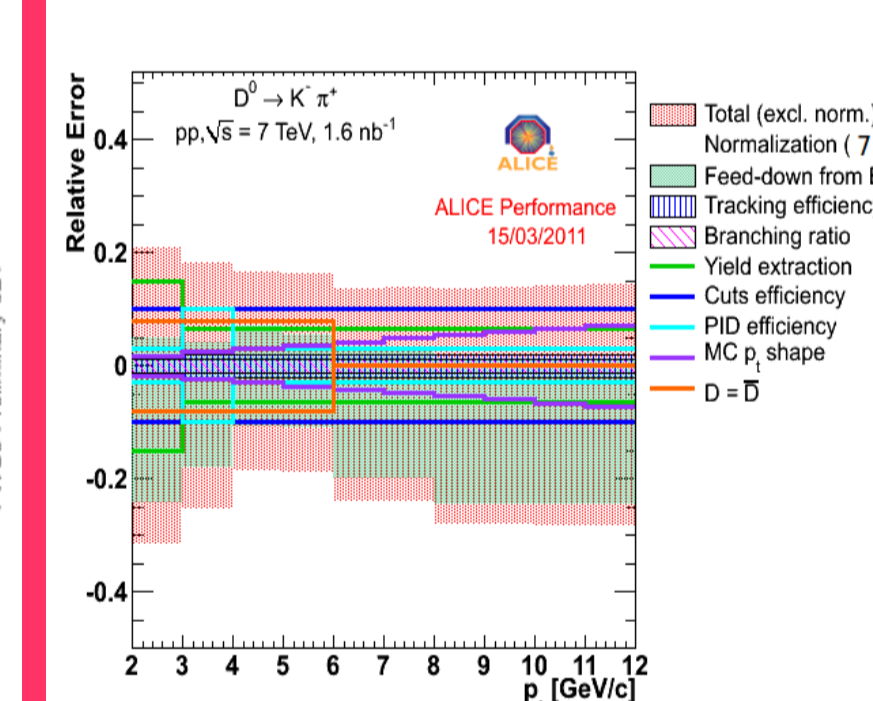
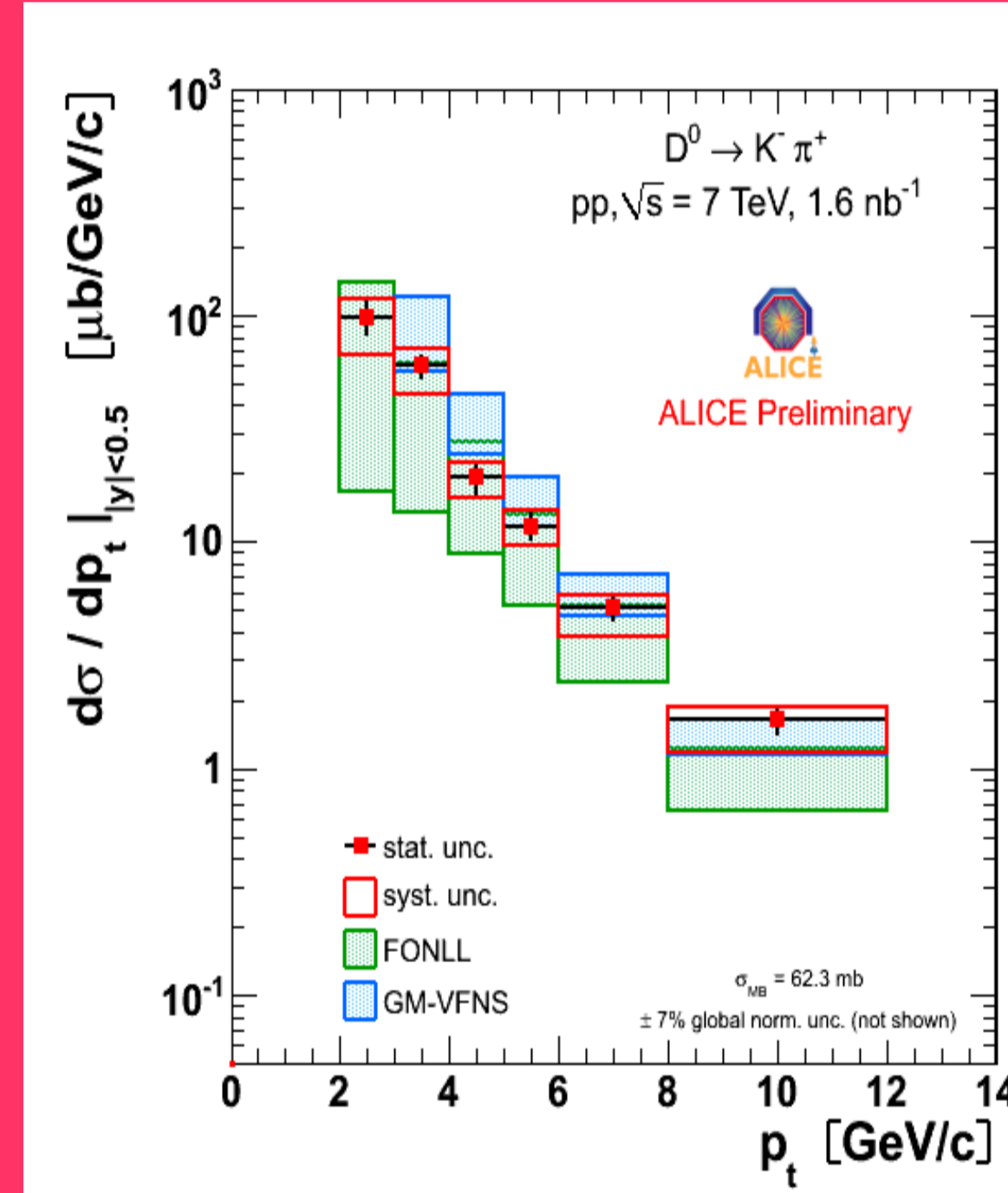
## Corrections

$$\frac{d\sigma^{D^0}}{dp_t} \Big|_{|y|<0.5} = \frac{1}{2} \frac{1}{2\Delta p_t} \frac{f_{\text{prompt}} \cdot N^{D^0} \text{ raw}(p_t)}{\epsilon_{\text{prompt}} \cdot \text{BR} \cdot L_{\text{int}}}$$

- Efficiencies from MC
- Tracking, PID, cuts
- Feed-down from B decay, 10% after selection cuts
- Fraction of secondary D estimated from FONLL



## D cross section in pp @ 7 TeV and comparison with other experiments

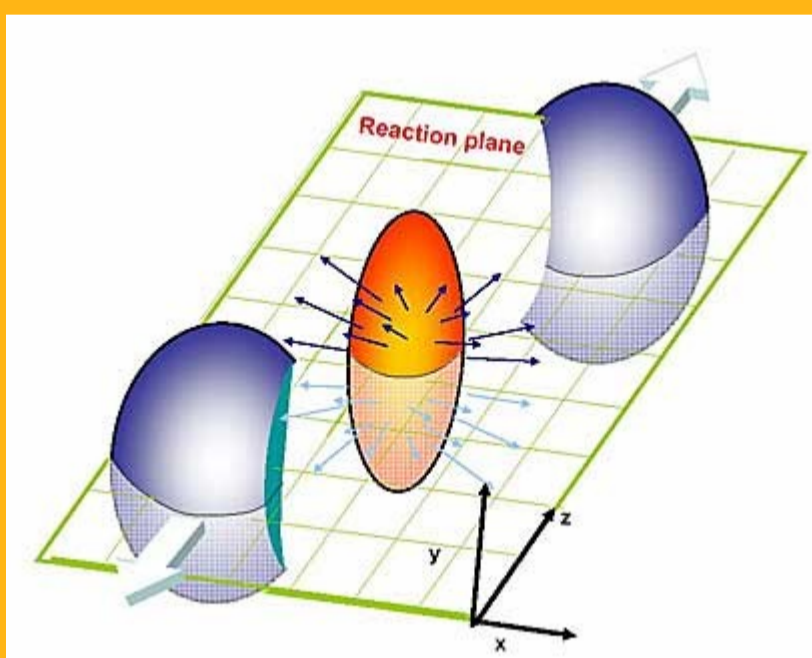


- Preliminary D<sup>0</sup> cross section in 2 < p<sub>t</sub> < 12 GeV/c
- pQCD predictions agree with our measurement

- D<sup>0</sup>/D<sup>+</sup> and D<sup>0</sup>/D<sup>+</sup>\* ratios agree with other experiments

## Charm elliptic flow in PbPb collisions with ALICE

- In non-central heavy ion collisions, the overlap region features a geometric anisotropy
- Pressure gradients convert it into momentum anisotropy, reflected in the azimuthal distribution of final particles



- The "elliptic flow" helps to figure out some properties of the medium:
  - Is it thermalized?
  - Is it strongly coupled?
  - Does the charm behave like light quarks?

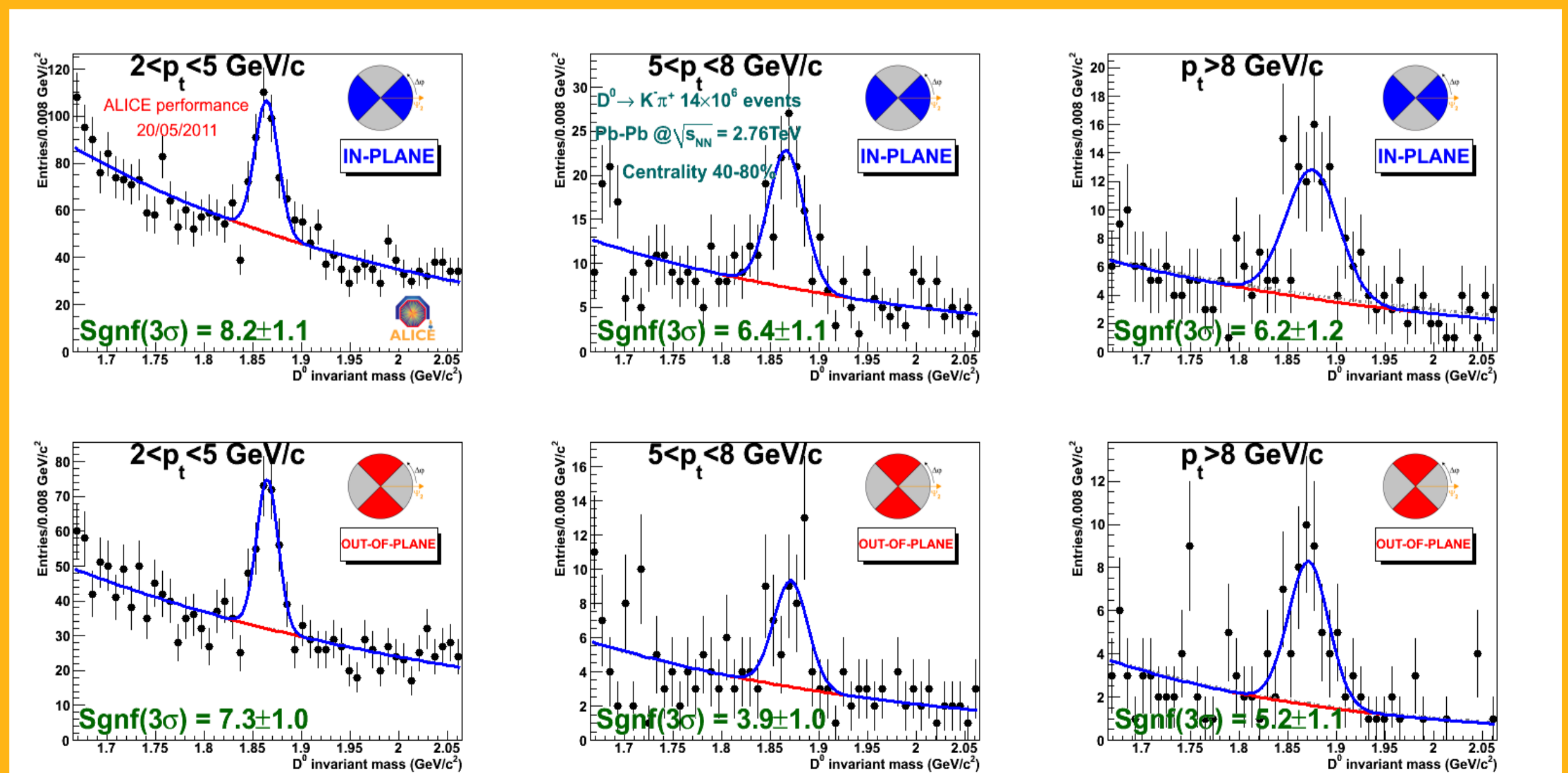
## Outlook for charm flow measurement

- Preliminary results very promising
- Next: more φ bins, other methods less affected by non-flow (statistics demanding)
- High statistics needed, looking forward for 2011 Pb-Pb run

## Analysis in preparation\*

- "Event plane" method: look for asymmetry between D<sup>0</sup> yield in-plane and out-of plane
- Reaction plane determined with all tracks, contribution of D<sup>0</sup> daughters subtracted

- D<sup>0</sup> invariant mass distributions after topological cuts and PID in-plane and out-of-plane in bins of p<sub>t</sub>



\* see R. Grajcarek's poster