



# A first look at decays in flight in CSA07 samples

F. Rebassoo, J. Richman, J.-R. Vlimant

# Next Slides

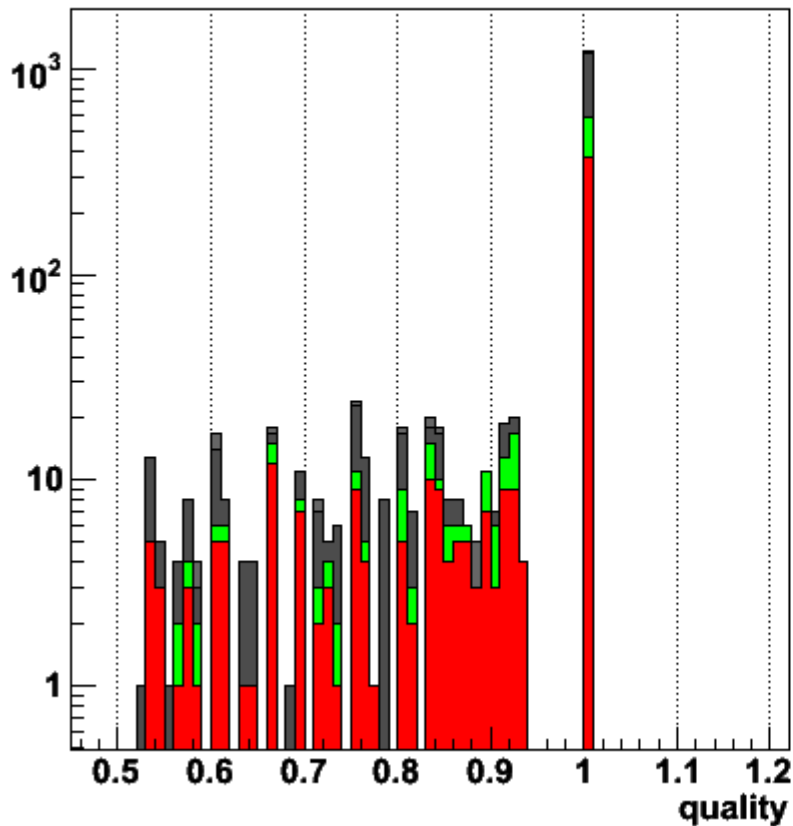
- no L1/HLT filters
- QCD\_Pt\_30\_50 CSA07 samples

# Associate L3 Tk-Tracks By Hits

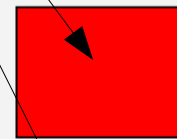
~50% of h13L3Muons:L2Seeded  
(tracker tracks) are made of  $\pi$ /K hits !

#hltL3Muon:L2Seeded = 1570  
no major pb with associator

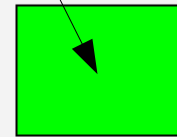
reconstructed by L3(tracker)



reconstructed by L3(tracker) : 1544.00



33.03 [%] association quality of reco::Track to  $\pi^{\pm}$



16.71 [%] association quality of reco::Track to K



47.22 [%] association quality of reco::Track to  $\mu^{\pm}$



3.04 [%] association quality of reco::Track to other

remember

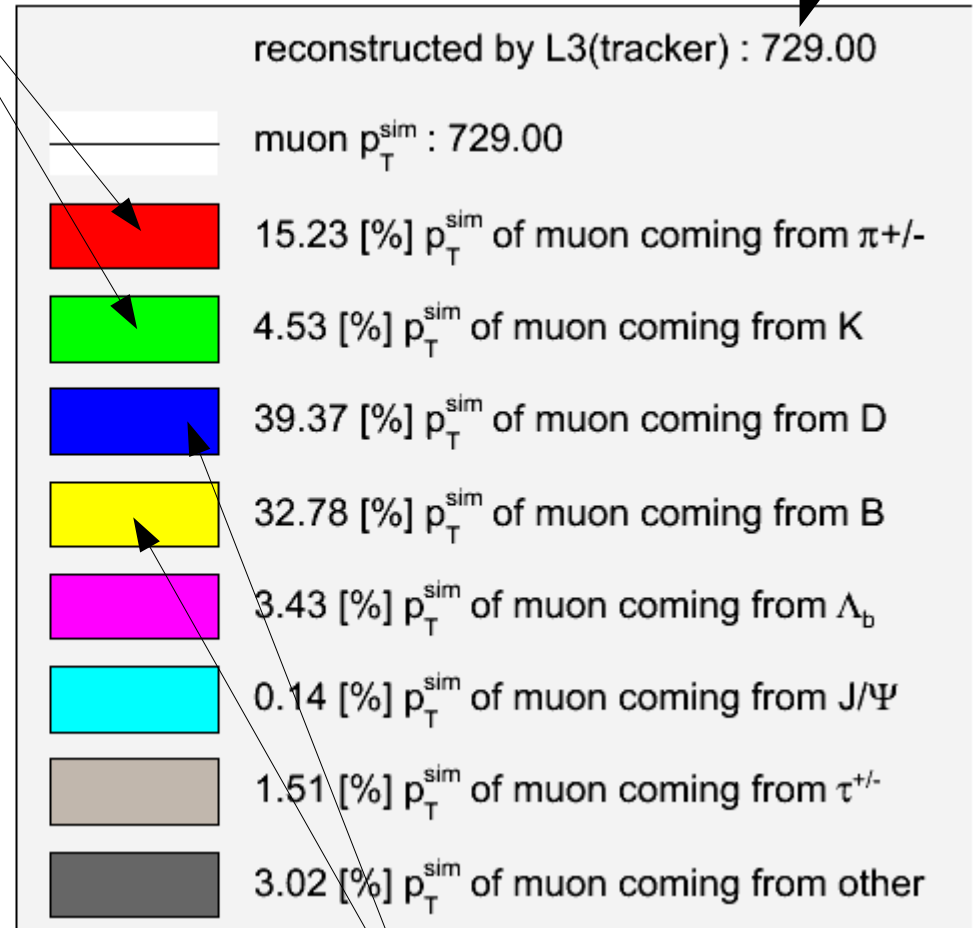
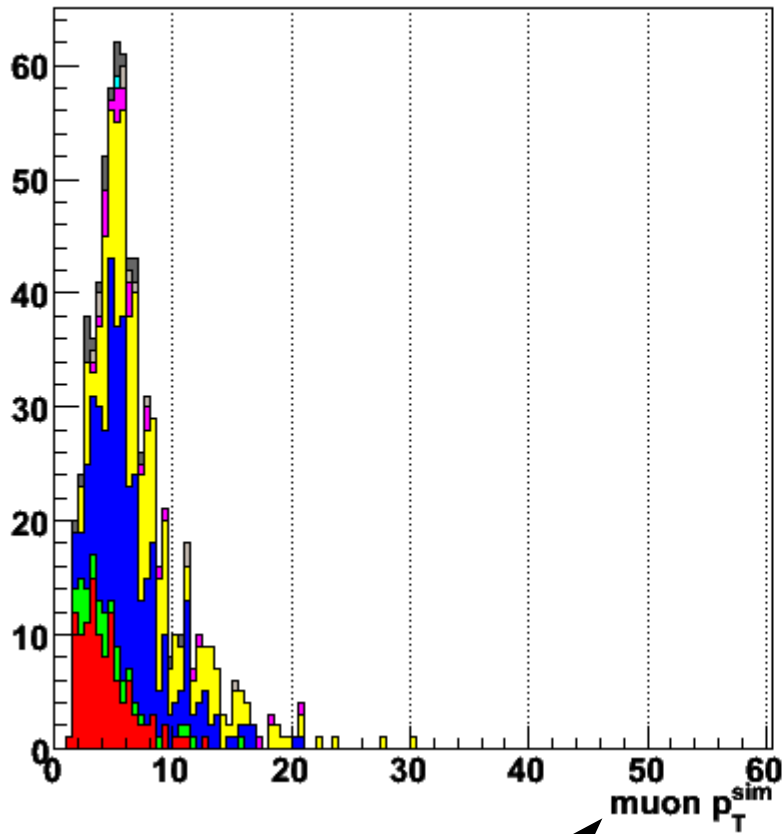
47.22% of 1544 = 729

# L3 Tk-tracks Associated (by hits) to $\mu$

~20% coming from  $\pi/K$  decays in  $\mu$

remember  
47.22% of 1544 = 729

reconstructed by L3(tracker)



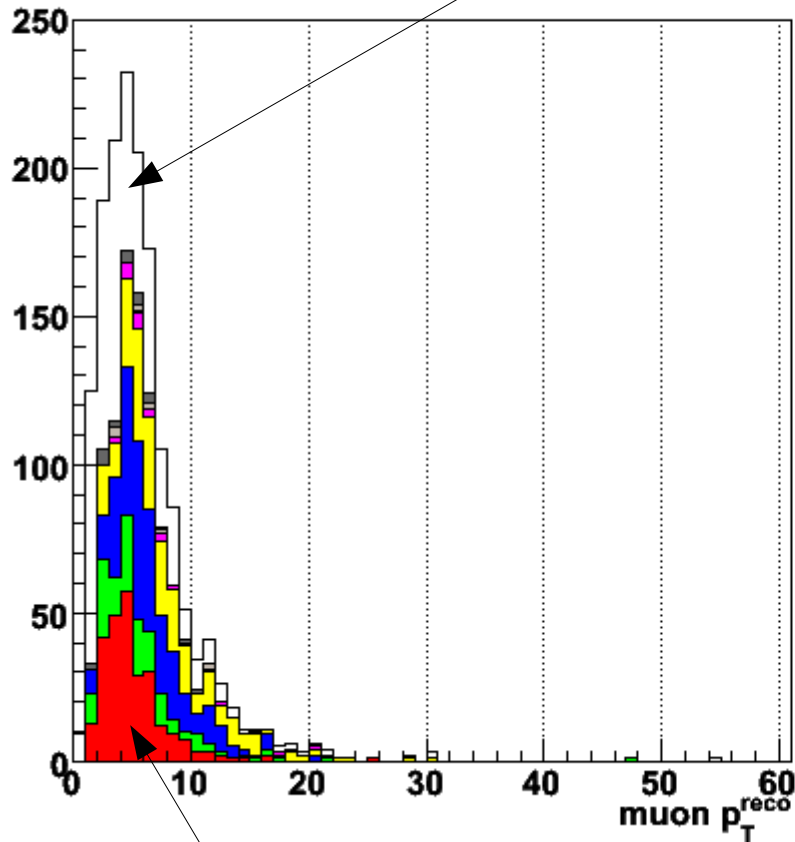
hltL3Muons:L2Seeded are not refitted  
in 16X: cannot plot the track  $p_T$

~70% coming from B/D decays in  $\mu$

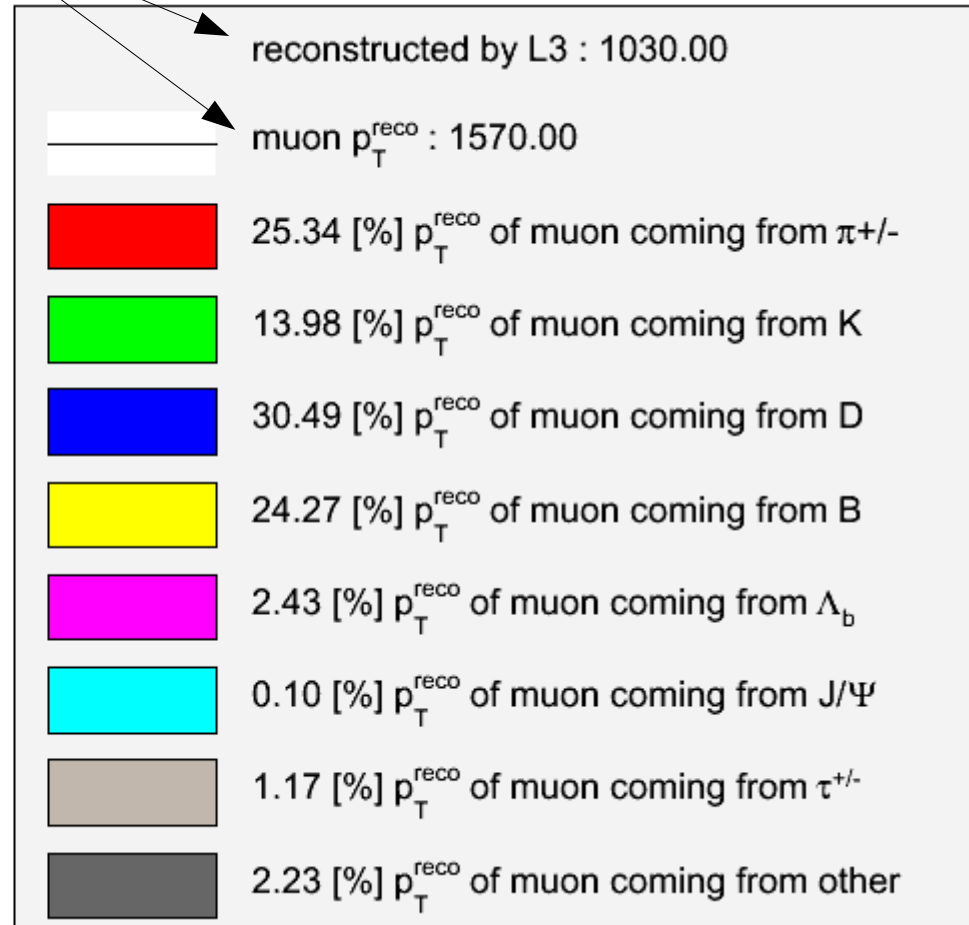
# Associate L3 Glb-Fit by $\Delta R < 0.1$ to $\mu$

540 not associated to  $\mu$ ,  
open space in stack

reconstructed by L3



$p_T$  of  $\mu$  from  $\pi/K$  decays are  
not too much overestimated



# Summary and Deductions

Decay vertex outside of the tracker

Is there a muon at all?  $\mu?$

Punch through?

1030 associated by  $\Delta R < 0.1$  to  $\mu$

Muon system

Tracker

Decay vertex inside of the tracker

$\pi/K$

$\pi/K$

$\pi/K$  and others

~800 associated by hits to  $\pi/K$

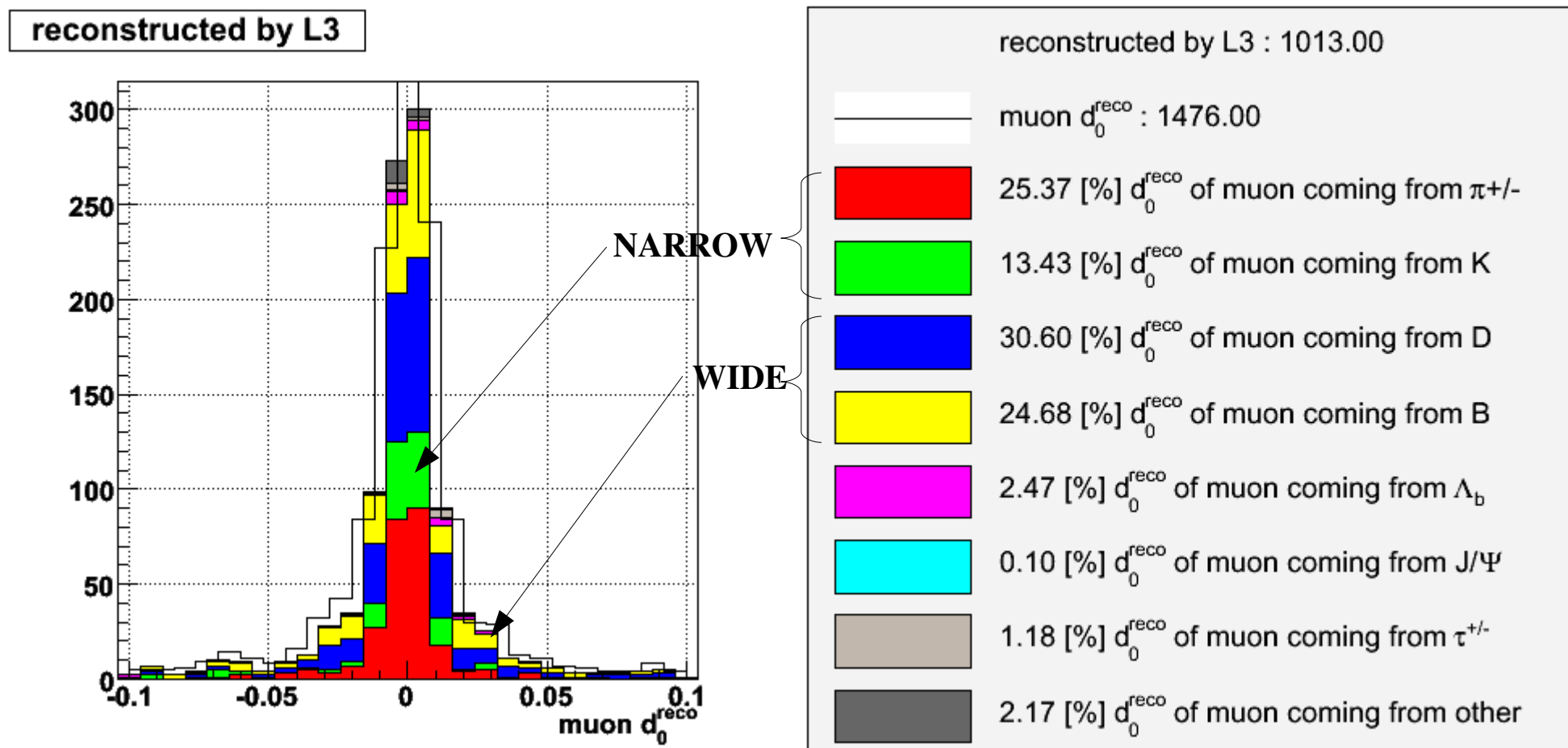
729 associated by hits to  $\mu$

By deduction ~500

By deduction ~300

# Conclusions: part 1

- A lot (50%) of L3 muons are **made from  $\pi/K$  tracks**
- Implication on  $d_0$  cut
  - short lived hadrons: pick up the muon track,  $d_0$  of muon (**wide**)
  - long lived hadrons: pick up the **hadron track,  $d_0$  of hadron track... (narrow)**
- Tend to remove B/D but not  $\pi/K$



# Remember

Open space in stack histograms mostly  $\pi/K$  :

- Punch through
- Hadron “late” decays



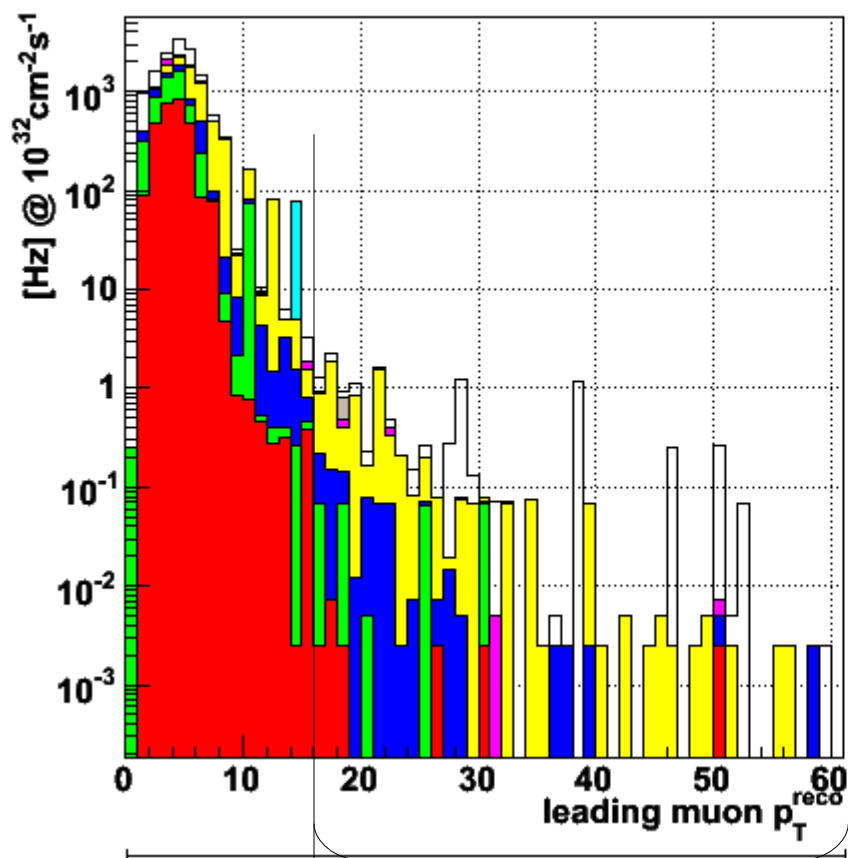
# Next Slides

- No filter Cut
- Plot L2 pT and L3 pT: need to plot 90% pT threshold
- Combine CSA07 samples according to Xsec/NbEvts
  - QCD\_Pt\_0\_15
  - QCD\_Pt\_15\_20
  - QCD\_Pt\_20\_30
  - QCD\_Pt\_30\_50
  - QCD\_Pt\_50\_80 : job aborted, not in plots
  - QCD\_Pt\_80\_120
  - QCD\_Pt\_120\_170 : job aborted, not in plots

$$\kappa = \frac{\sigma [mb]}{NbEvt [M]} \text{ for } L = 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$$

# Leading L2 Muon $p_T$

L2



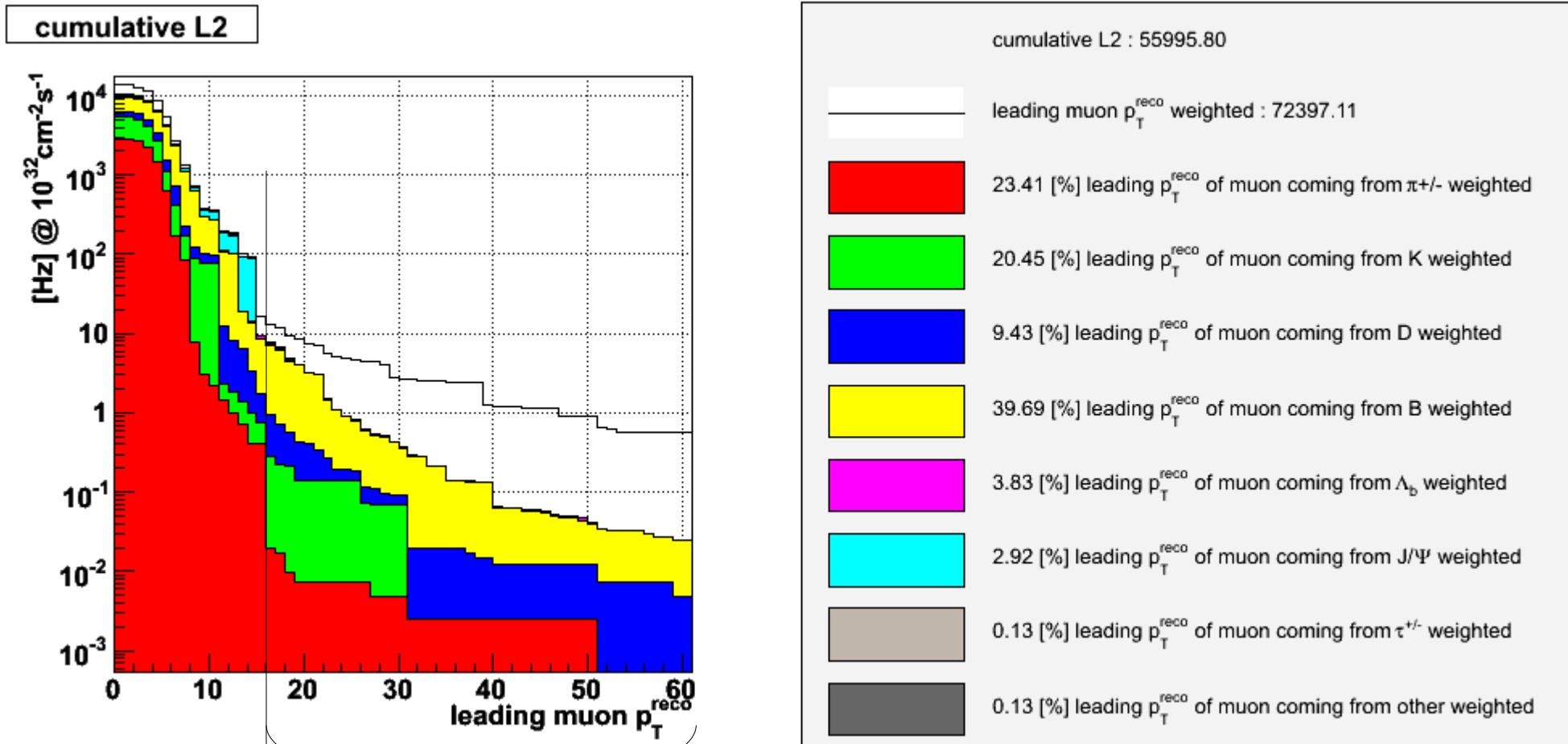
16 GeV

- There's not much  $\mu$  from  $\pi/K$  above threshold
- There are quite some punch throughs (open space in the stack)

L2 : 10297.11



# Cumulative: Leading L2 Muon $p_T$

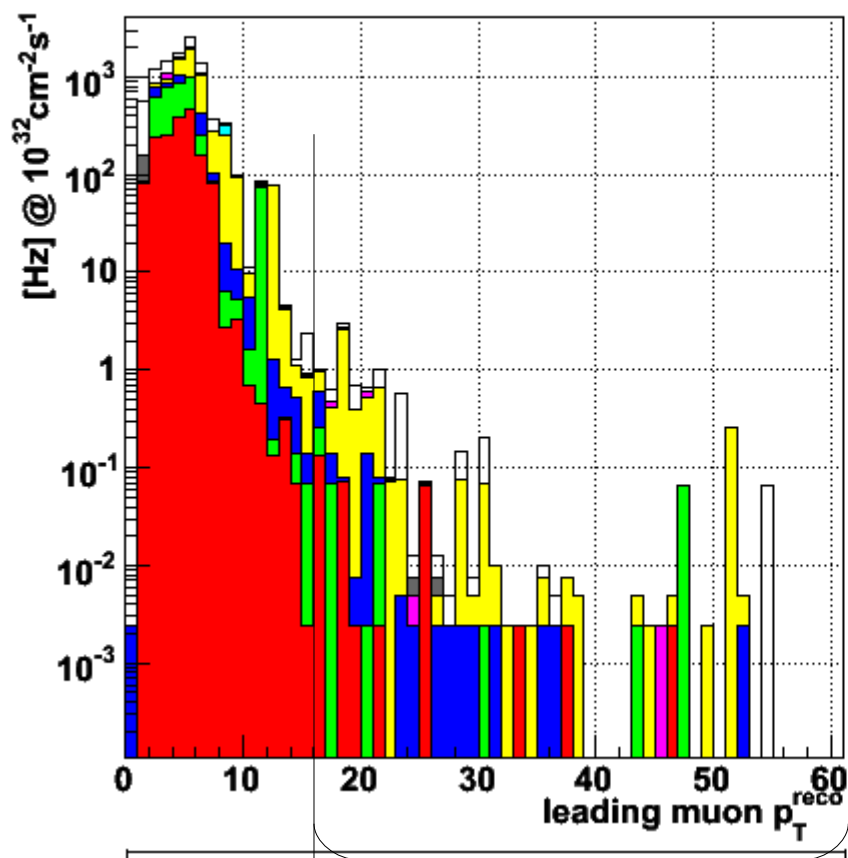


16 GeV

- There's not much  $\mu$  from  $\pi/K$  above threshold
- There are quite some punch throughs (open space in the stack)

# Leading L3 Muon $p_T$

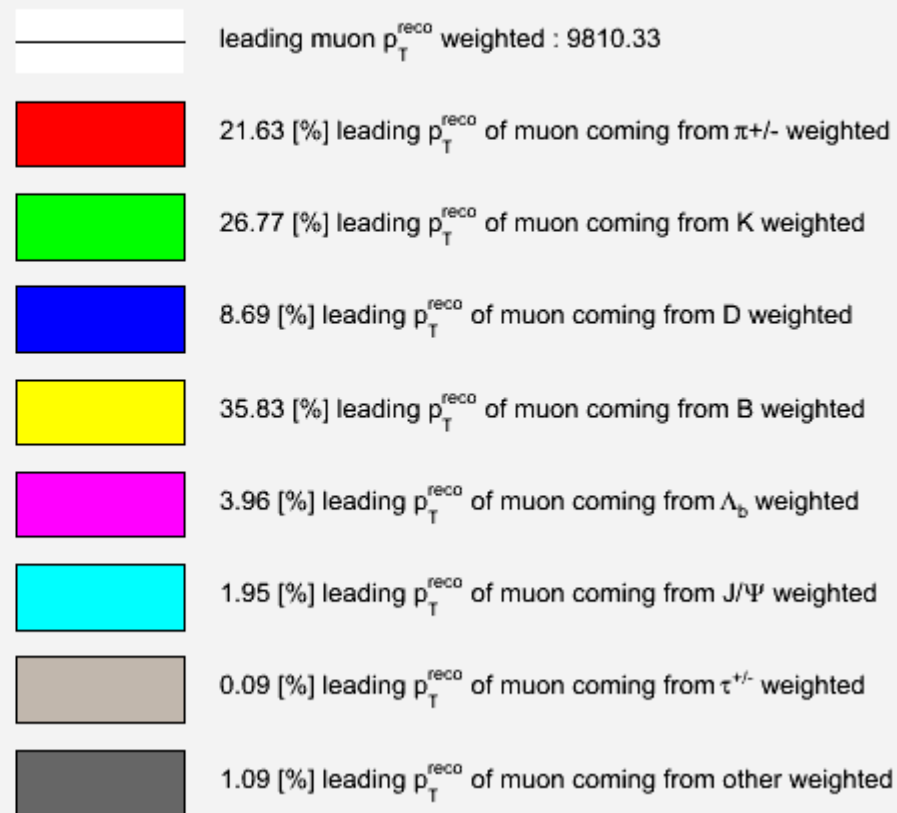
L3



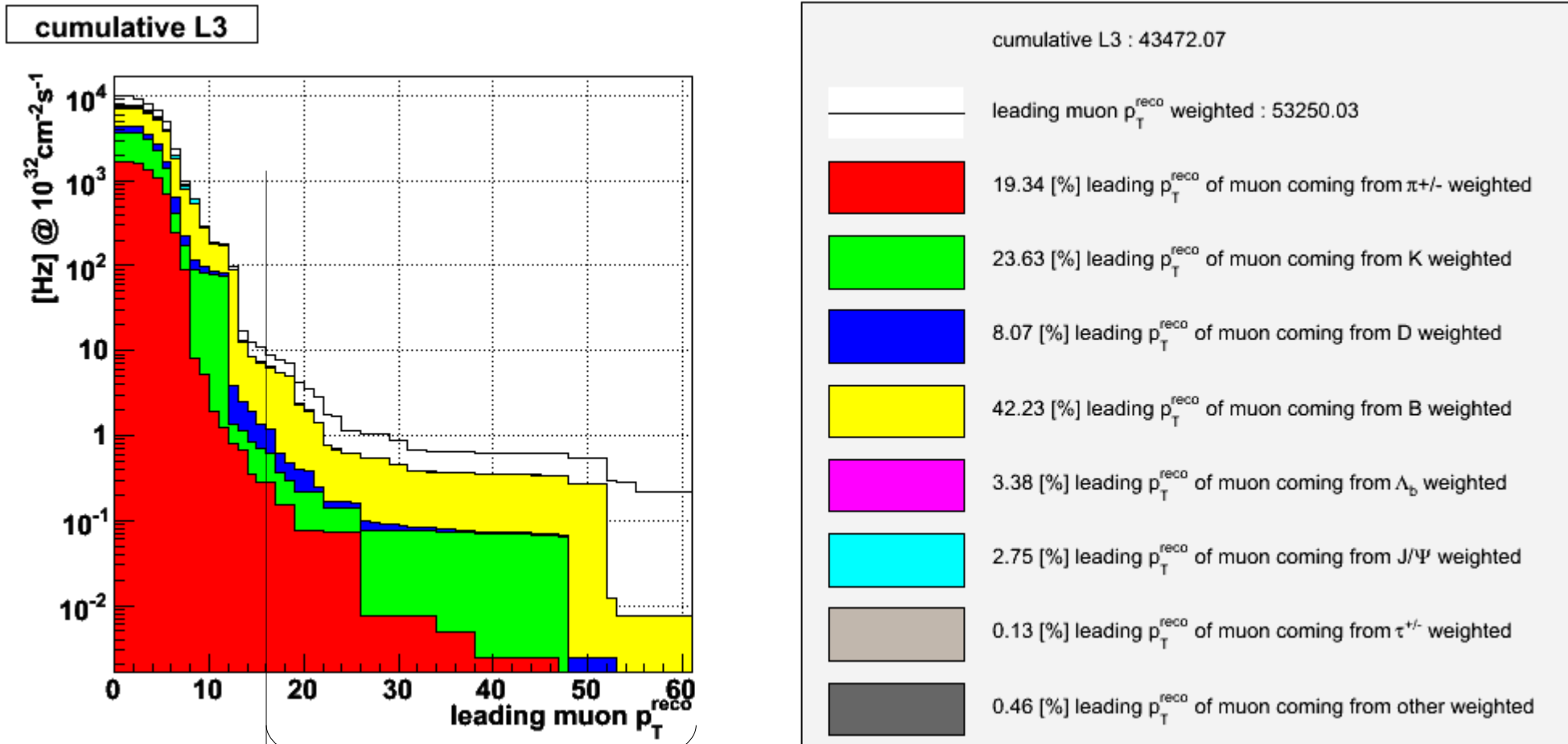
16 GeV

- There's not much  $\mu$  from  $\pi/K$  above threshold
- Less punch throughs (open space in the stack)

L3 : 7694.87



# Cumulative: Leading L3 Muon $p_T$



16 GeV

- There's not much  $\mu$  from  $\pi/K$  above threshold
- Less punch throughs (open space in the stack)

# Conclusions: part 2

- Large rate of  $\pi/K$  at L2
- Killing J/Psi ...
- Rate of  $\pi/K$  reduced at L3
  - from  $p_T$  , not  $d_0$  cut