

Particle ID in MC09

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Introduction

- Particle ID Performance in latest MC09 Min. Bias samples
 - Using “Sim03Reco02” samples
 - Fixed OT material description
 - Compare to DC06 samples (Brunel v32)
- Particle ID at higher luminosities
 - Latest $\nu=1,2,3,4$ MC09 Minimum Bias samples
 - *Disclaimer* - A first look only :-
 - No algorithm tuning or optimisation for high occupancies
 - Not all results fully understood.
 - Please consider all results as preliminary

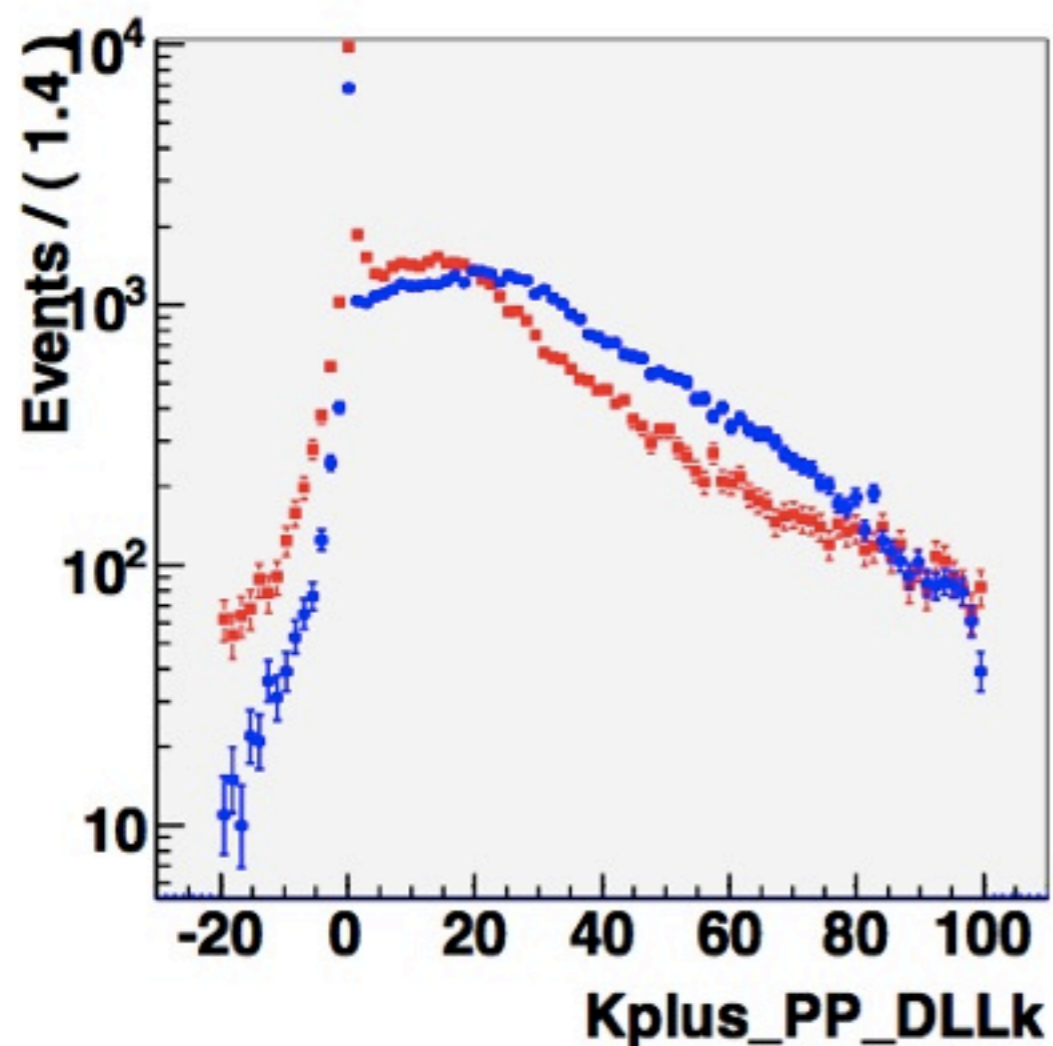
Kaon ID

RICH

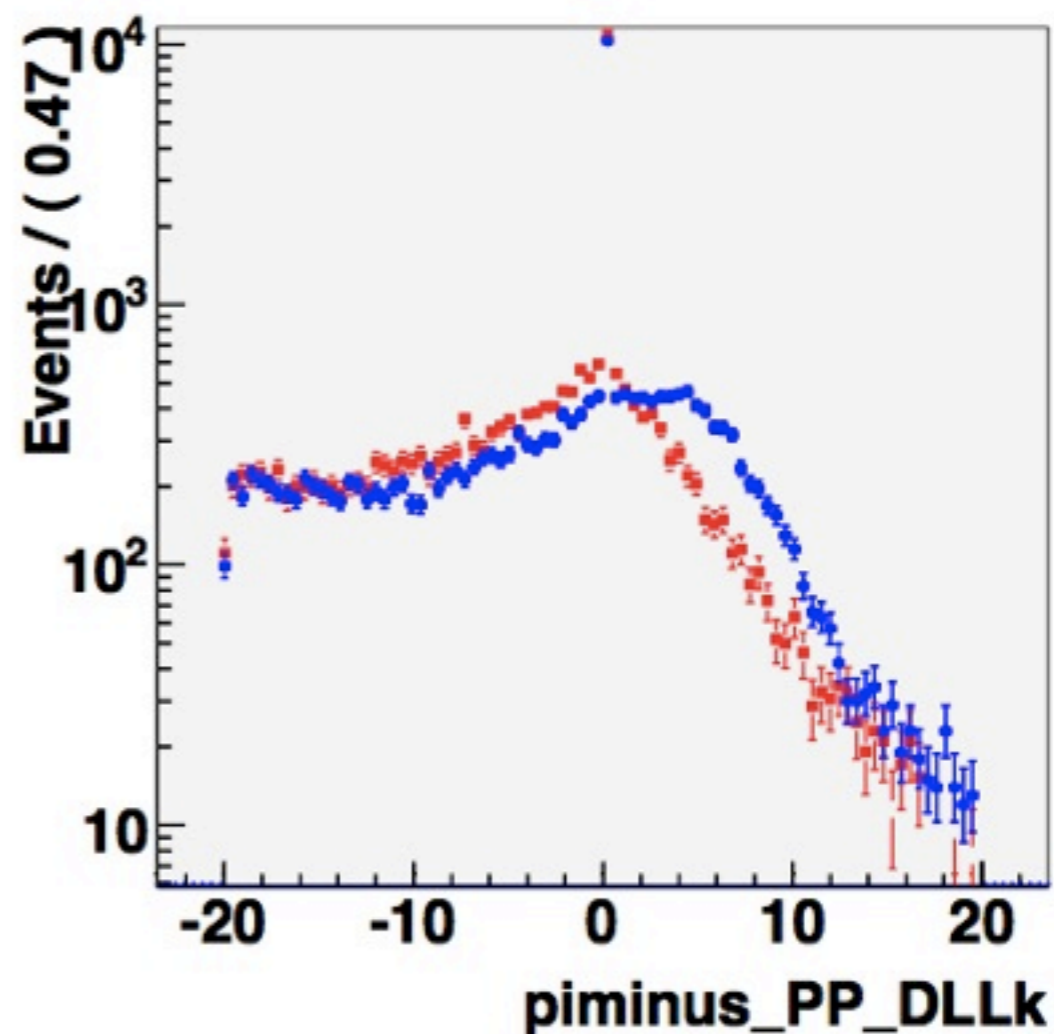
DLL $K - \pi$

MC09

DC06(v30)



True K DLL($K - \pi$)

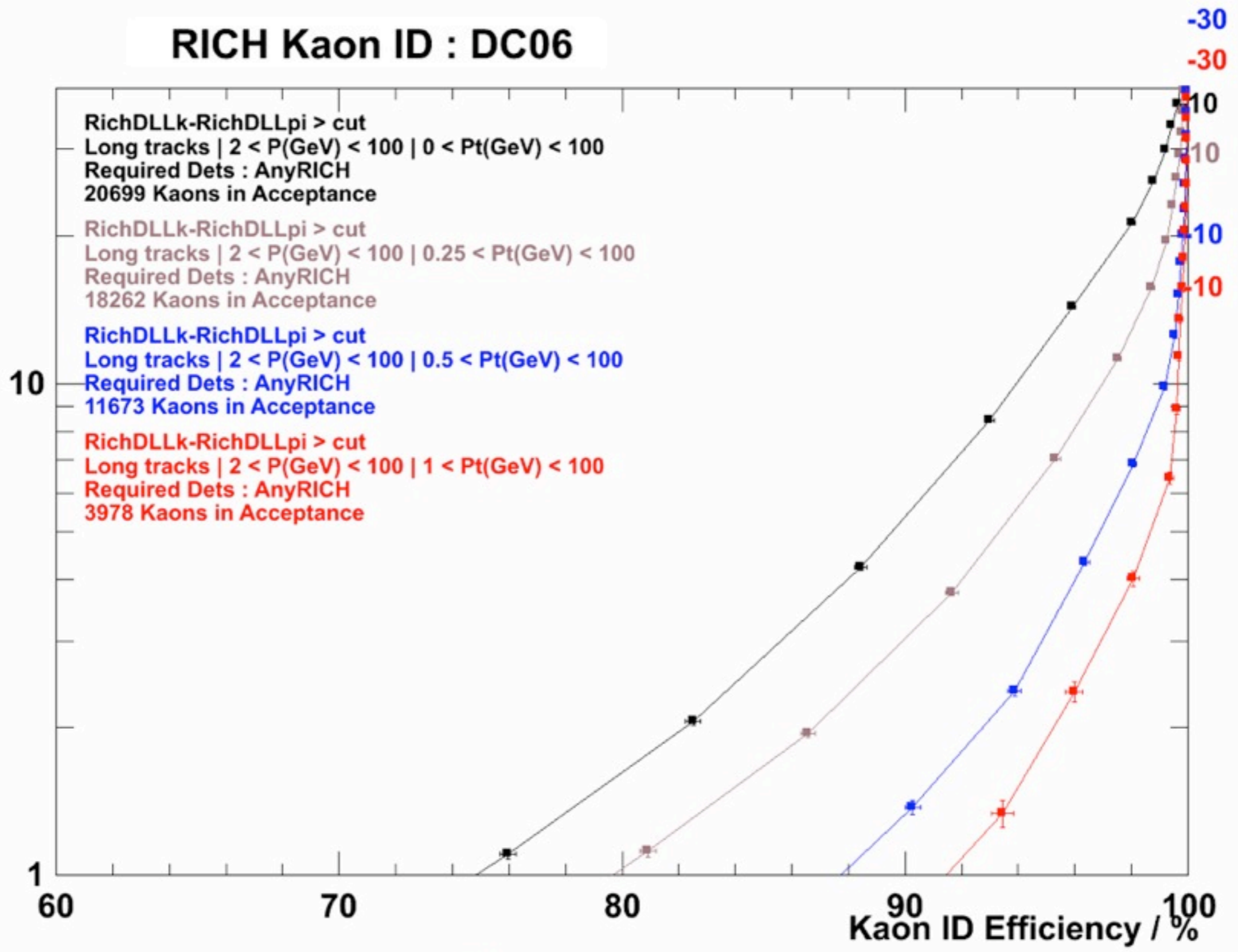


True π DLL($K - \pi$)

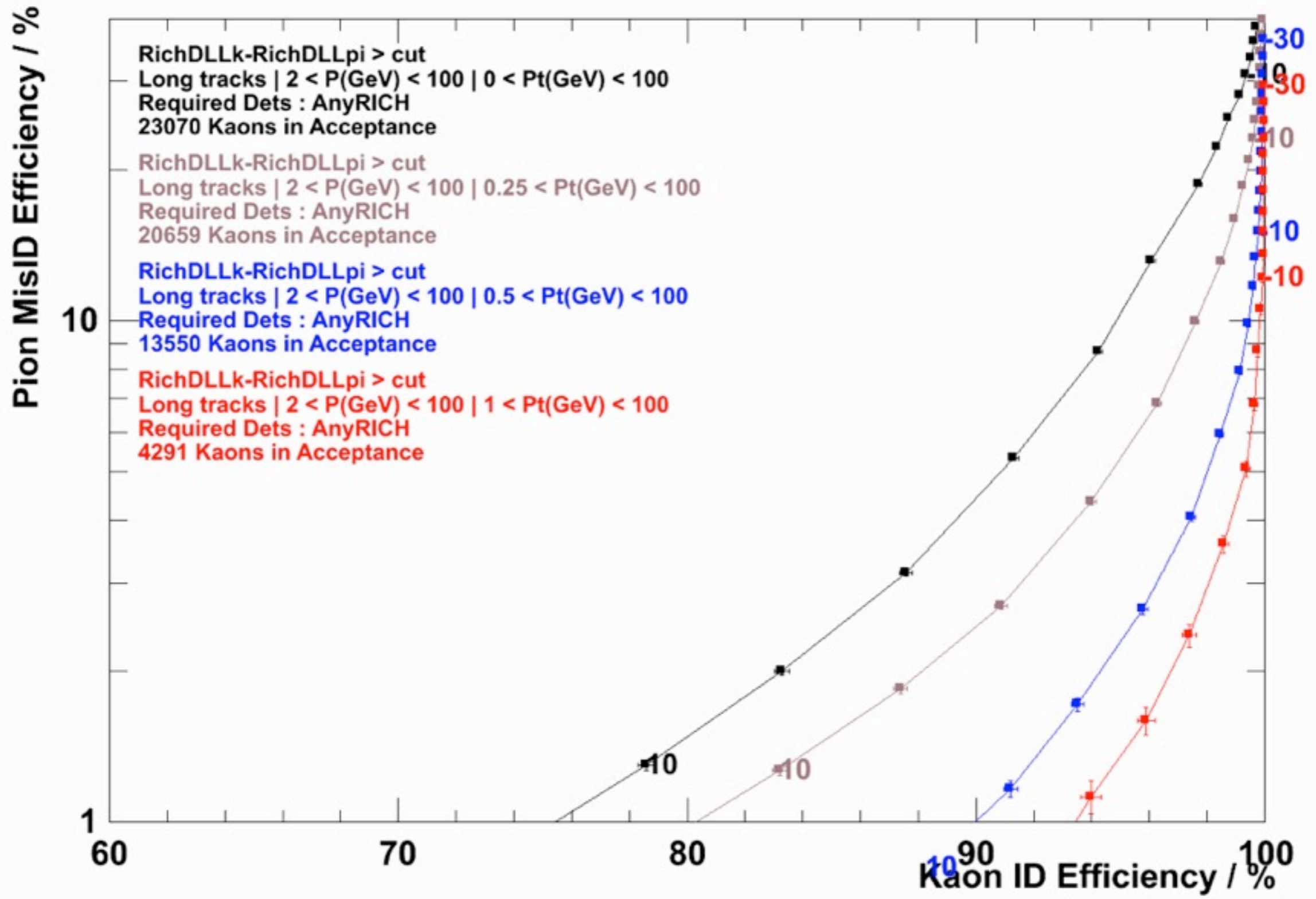
Very different distribution

RICH Kaon ID : DC06

Pion MisID Efficiency / %



RICH Kaon ID : MC09



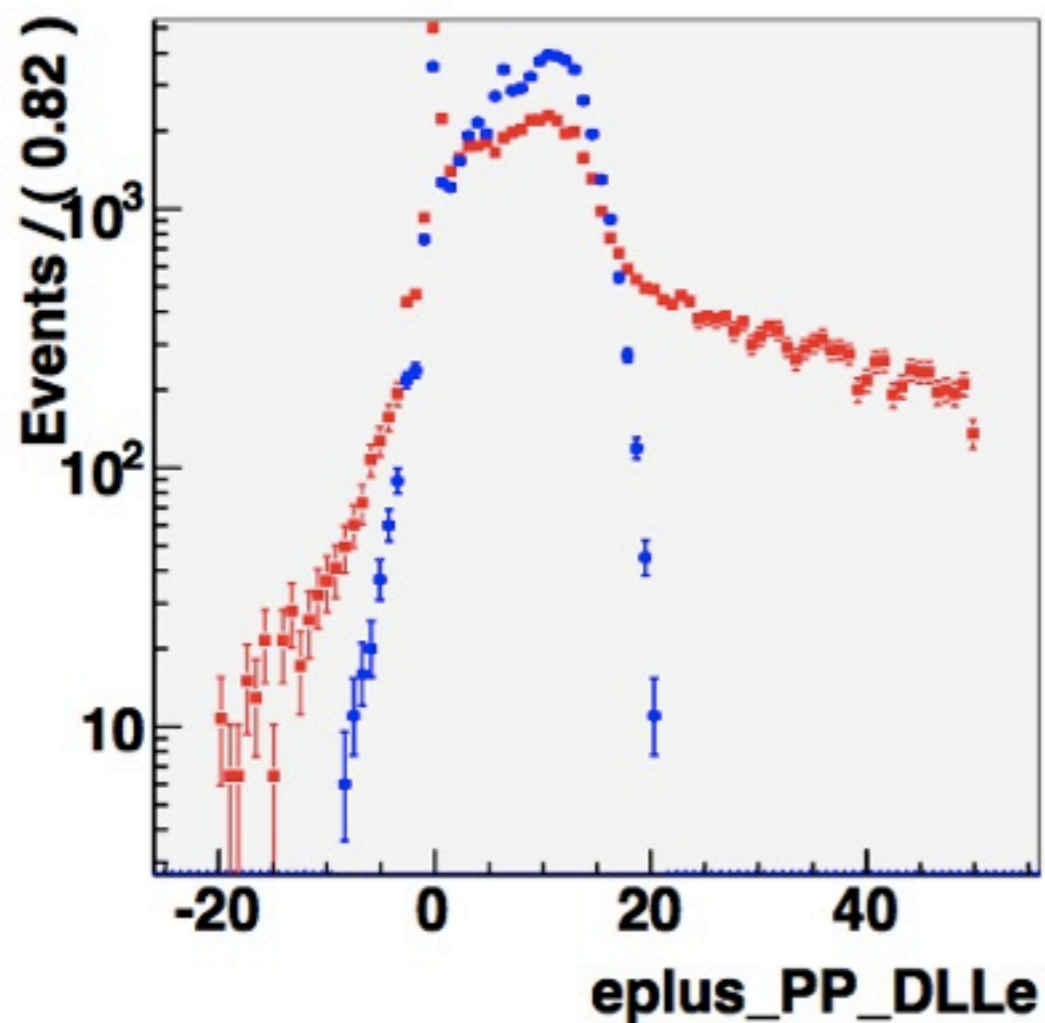
Electron ID

CALO + RICH

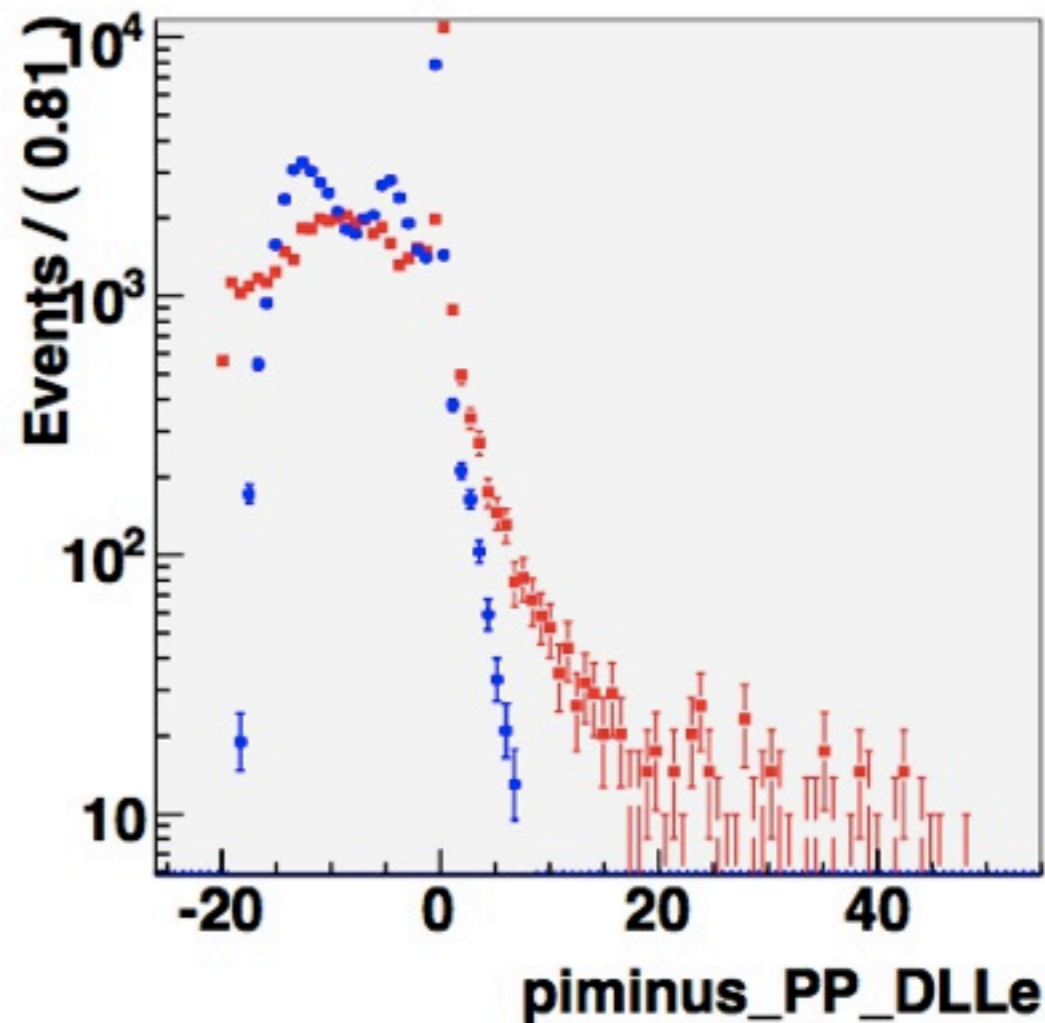
DLL $e - \pi$

MC09

DC06(v30)



True e DLL($e - \pi$)

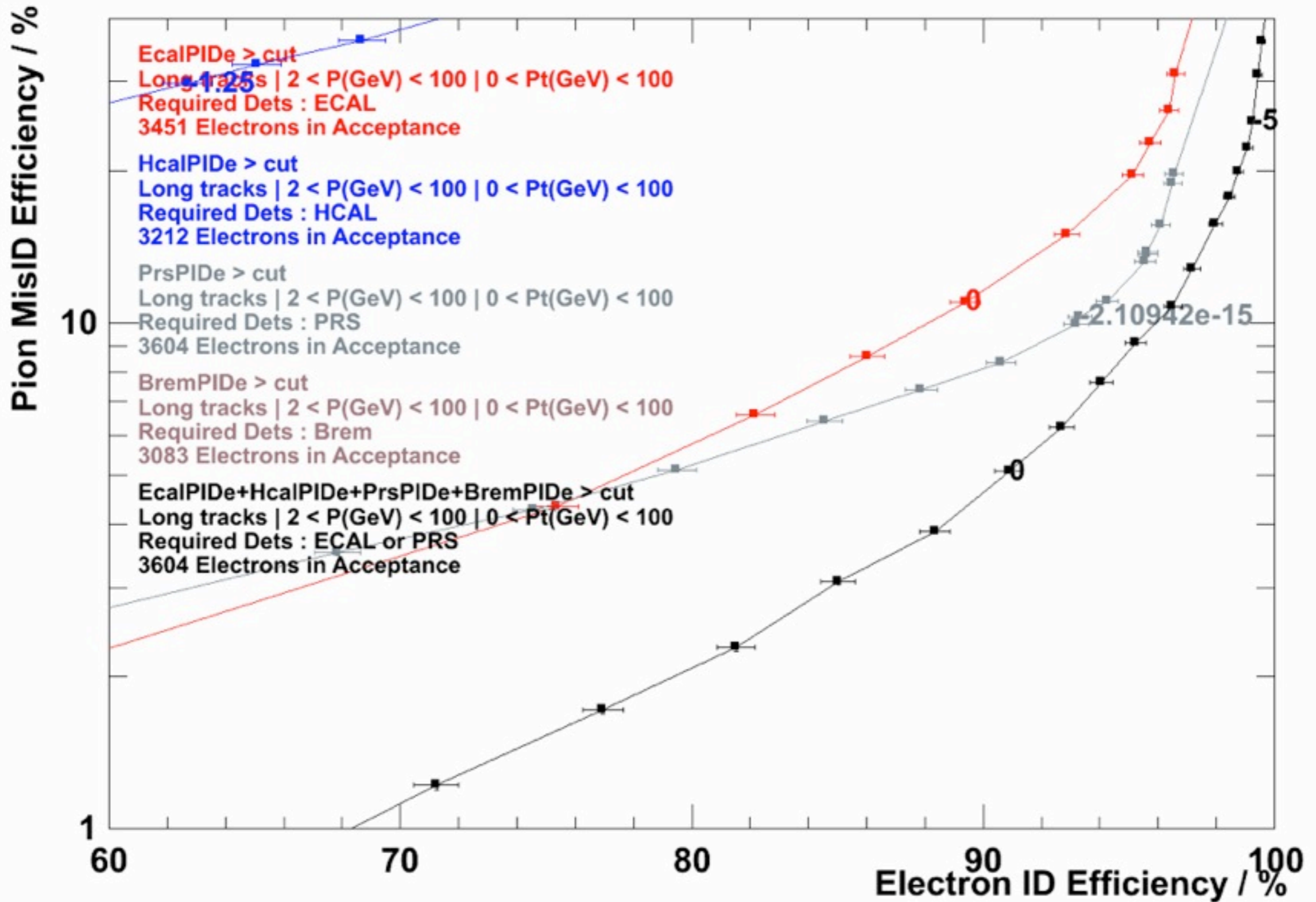


True π DLL($e - \pi$)

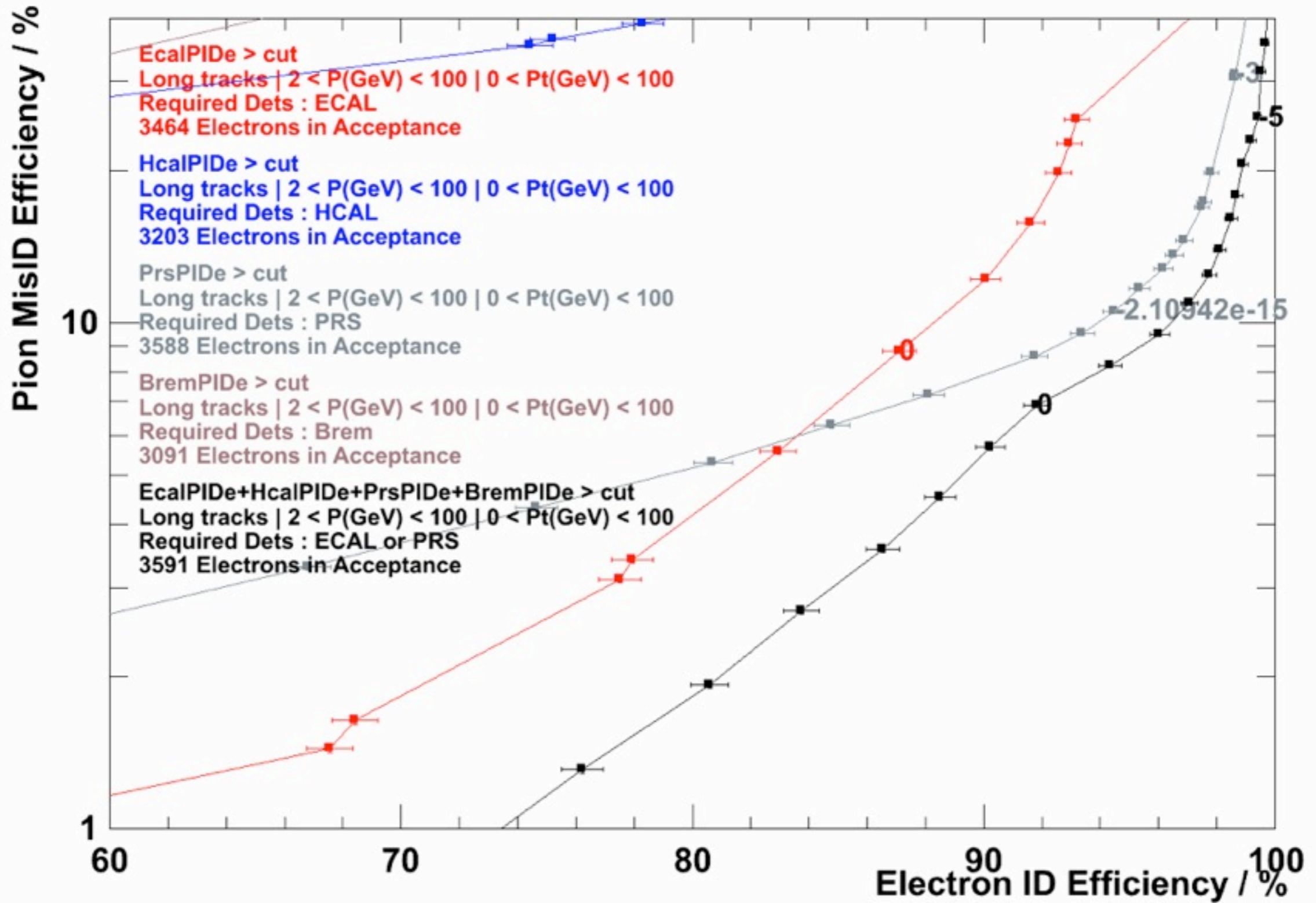
Very different distribution

CALO Electron ID : DC06

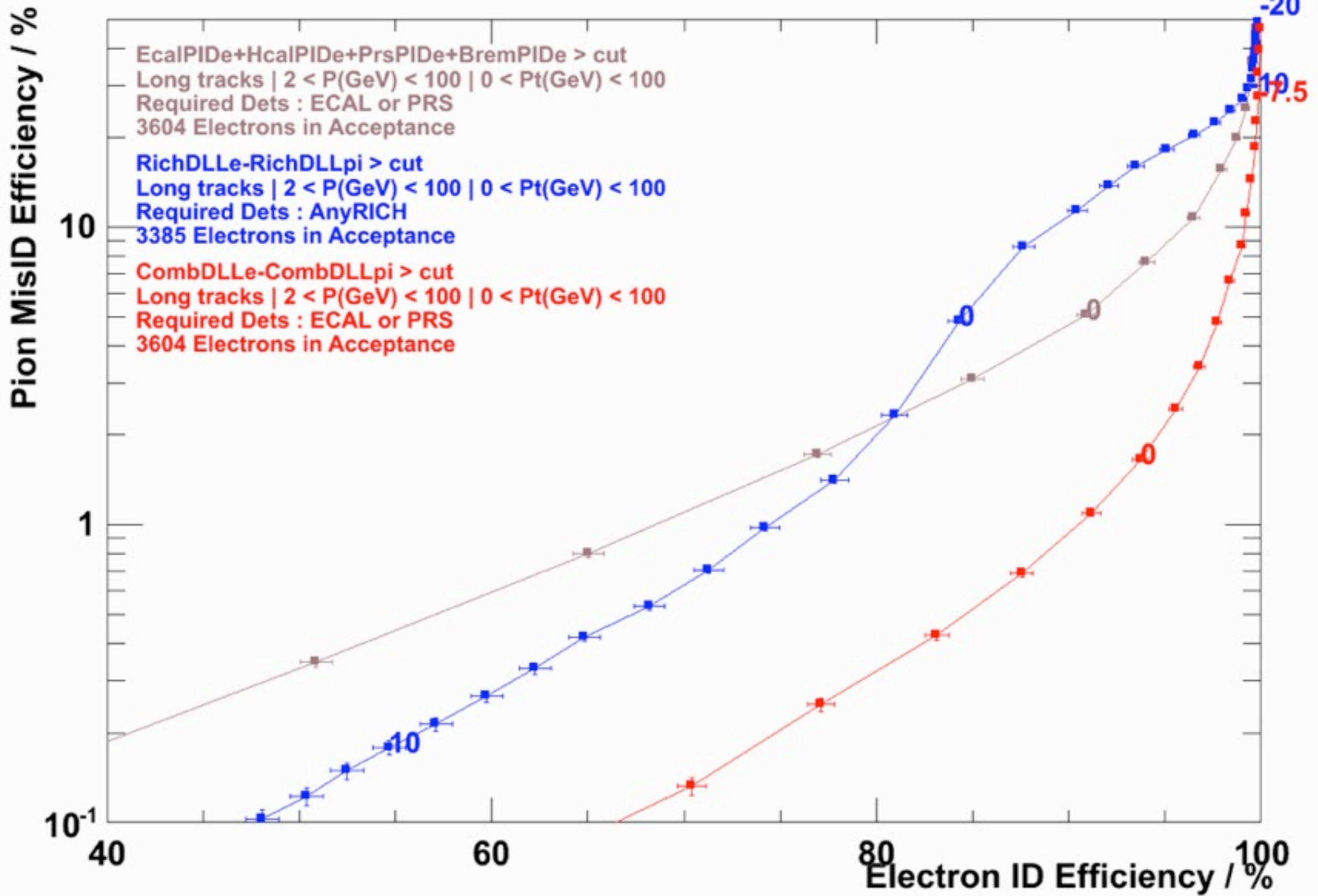
-3



CALO Electron ID : MC09

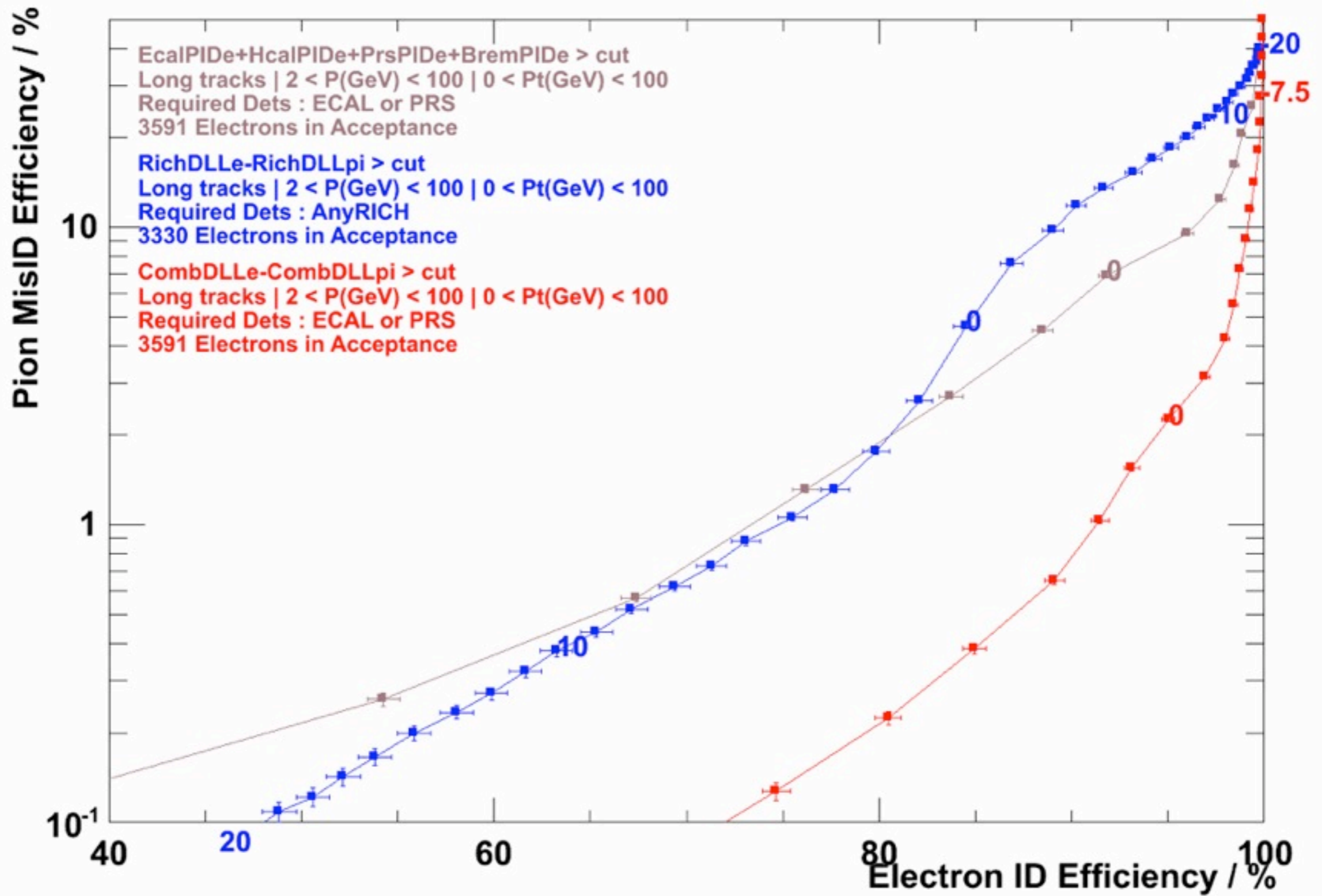


Electron ID : CALO V RICH V Combined : DC06



Electron ID : CALO V RICH V Combined : MC09

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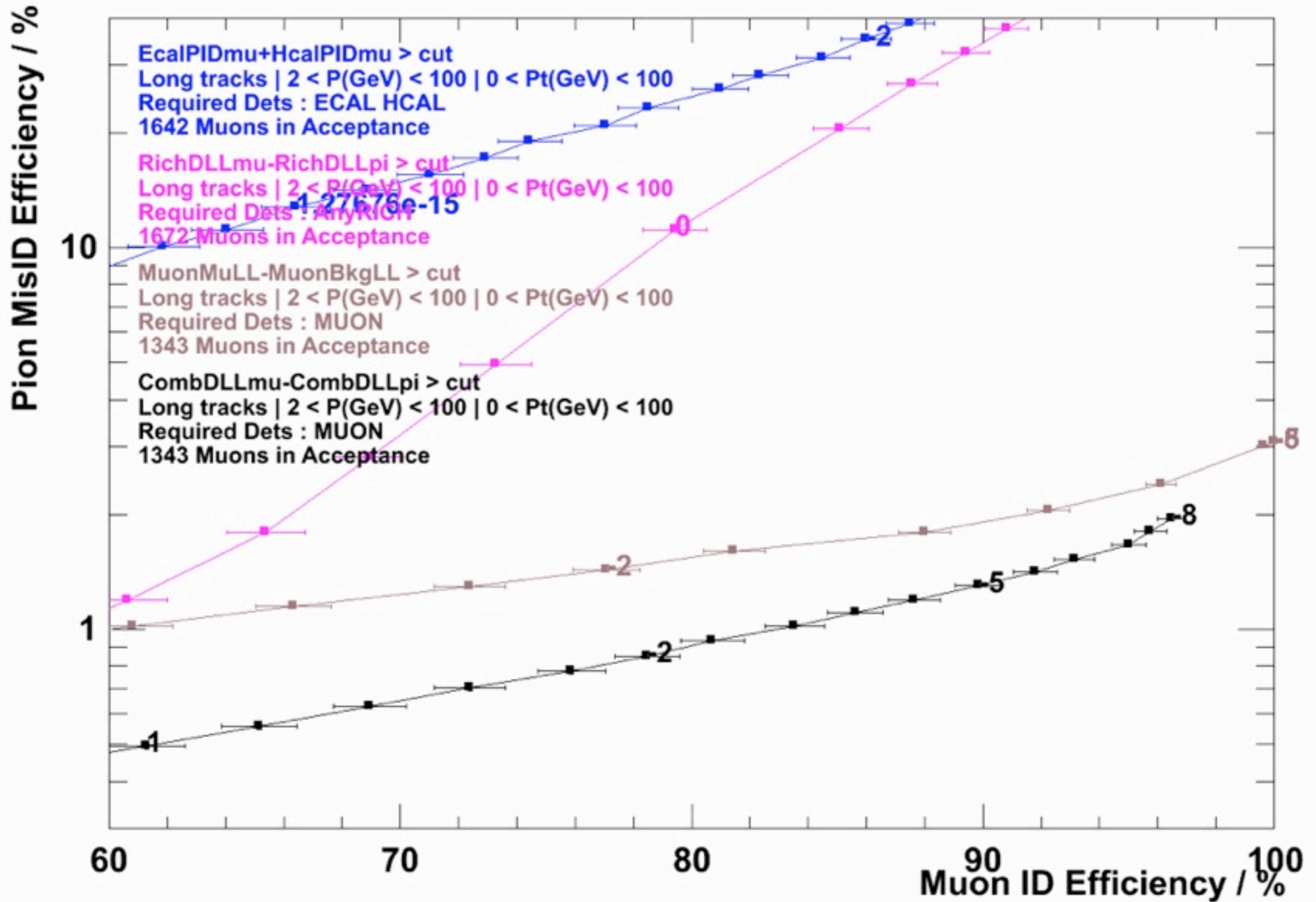


Muon ID

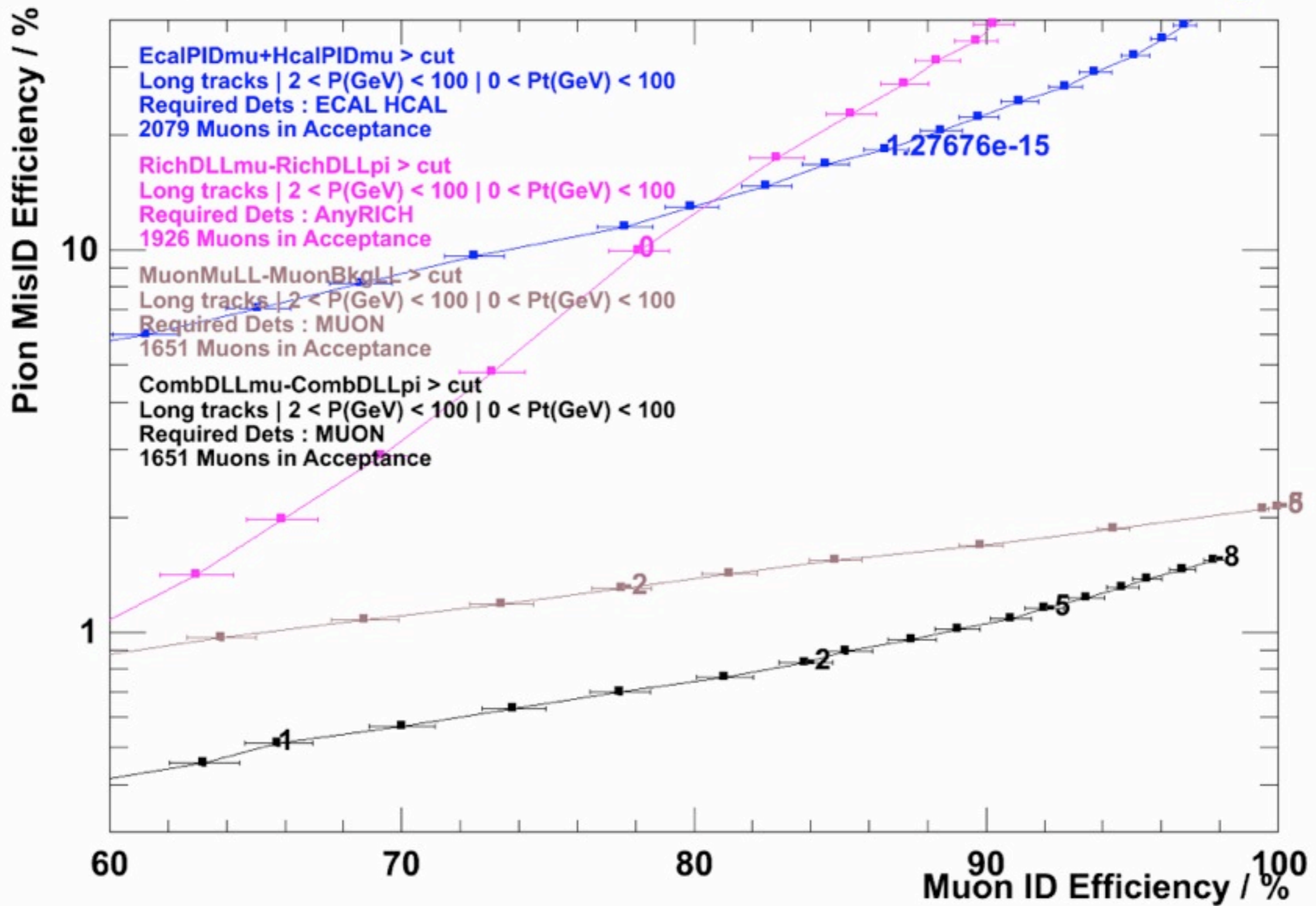
Muon, CALO and RICH

Muon ID : DC06

-40



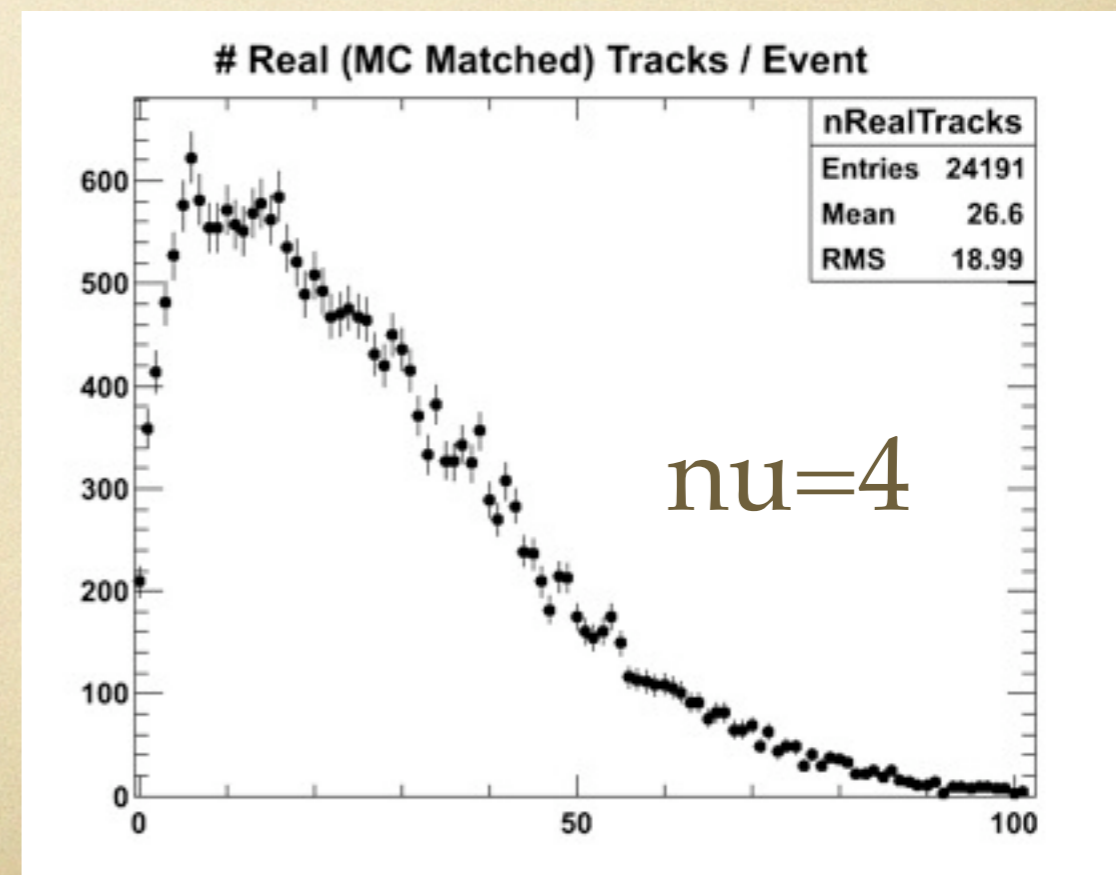
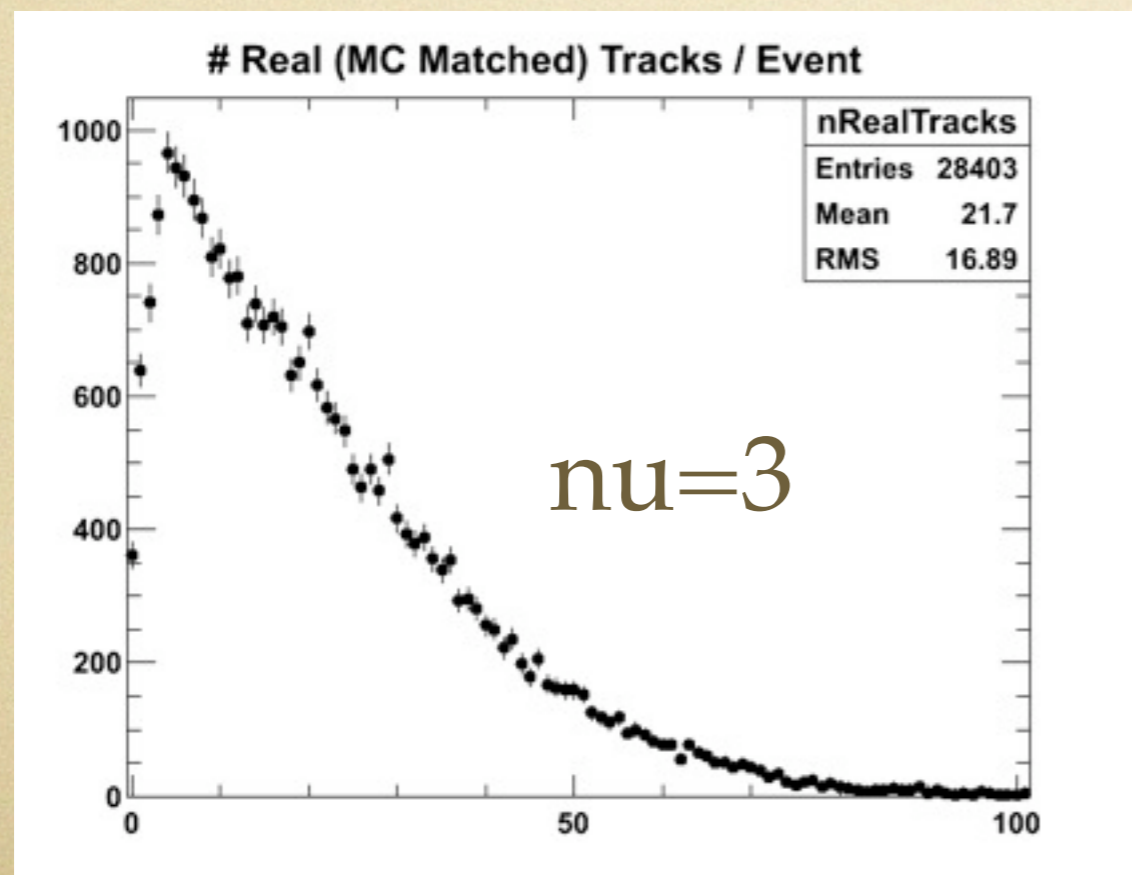
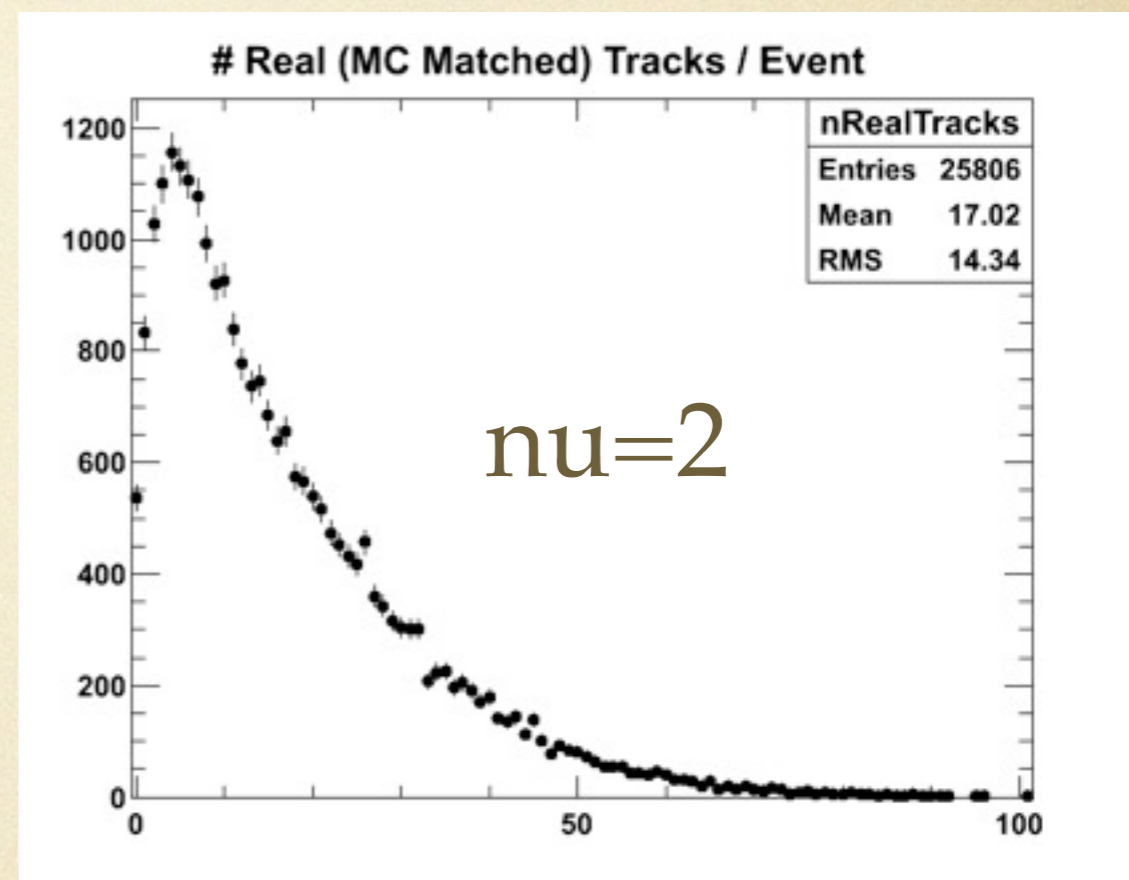
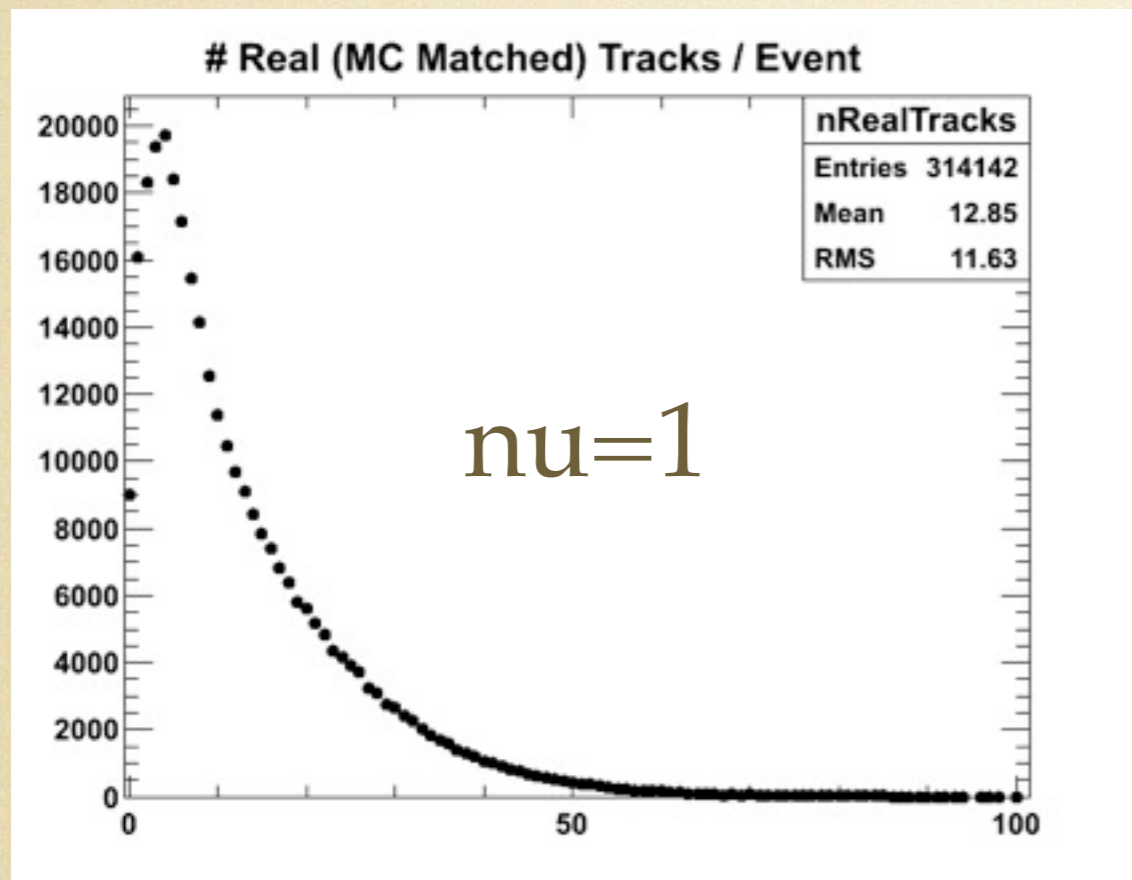
Muon ID : MC09



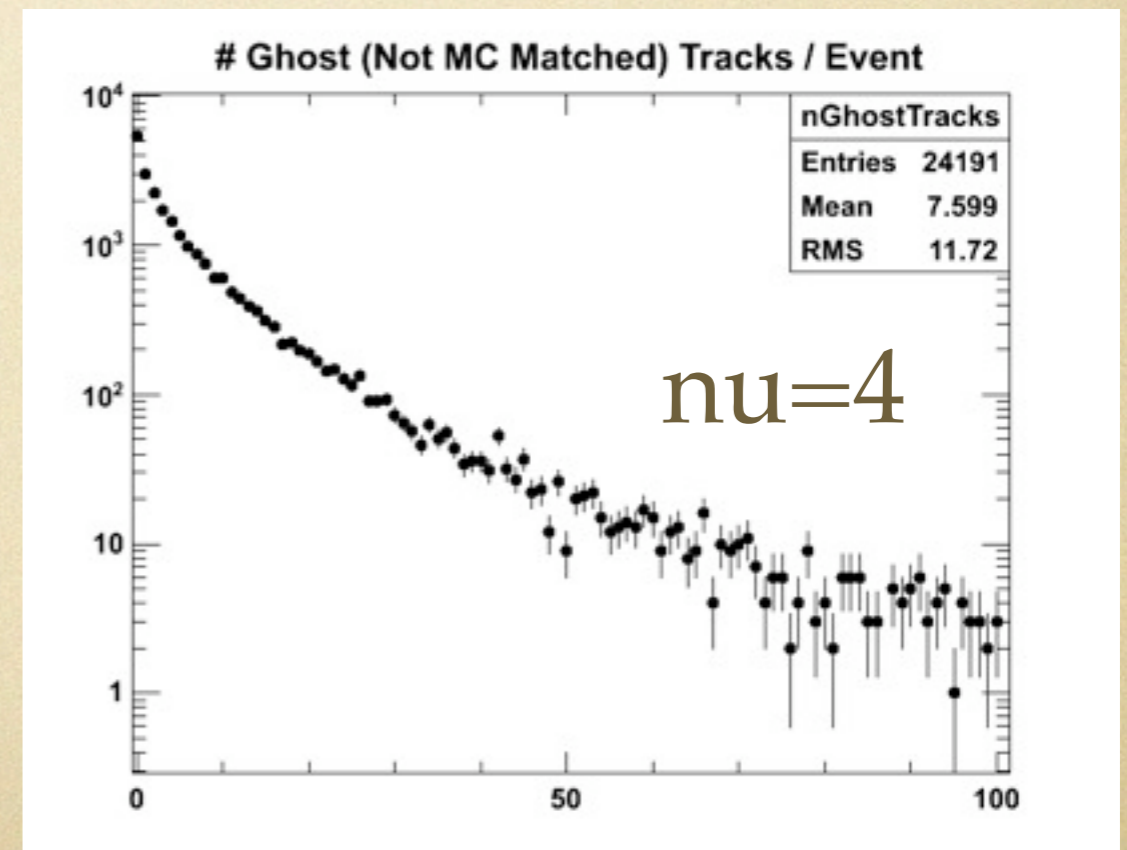
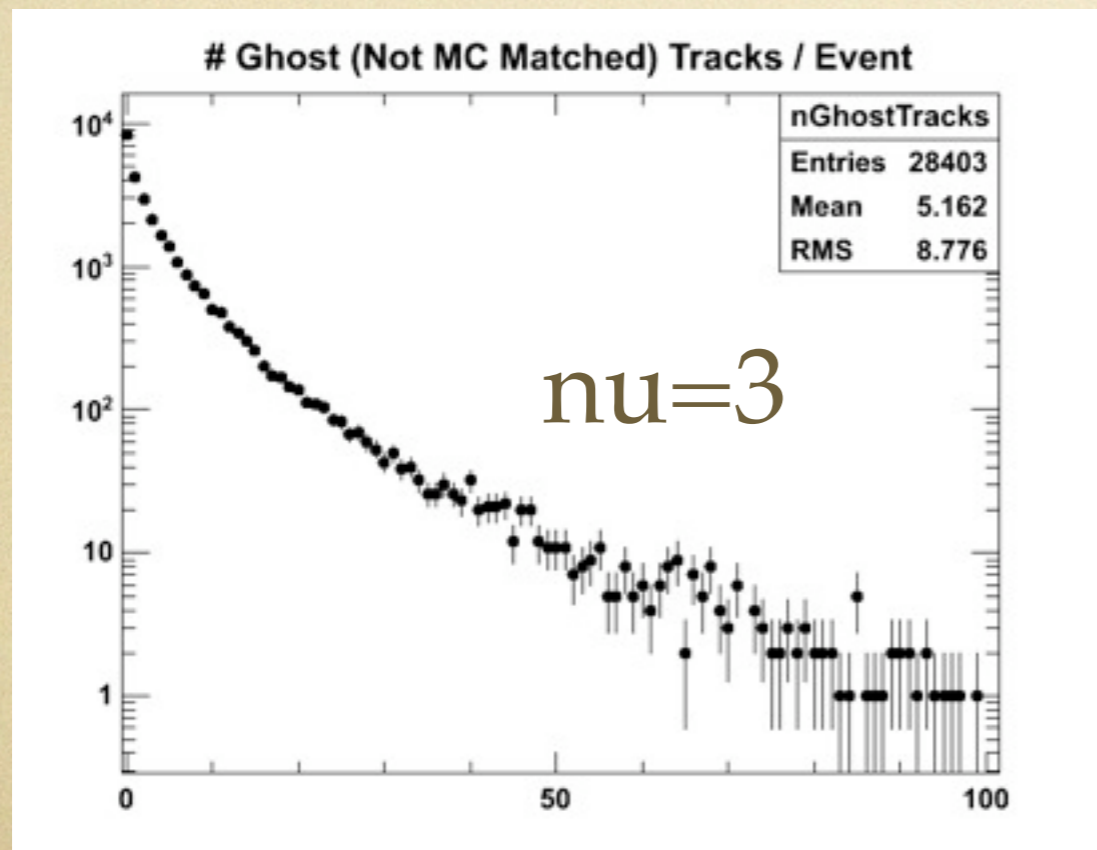
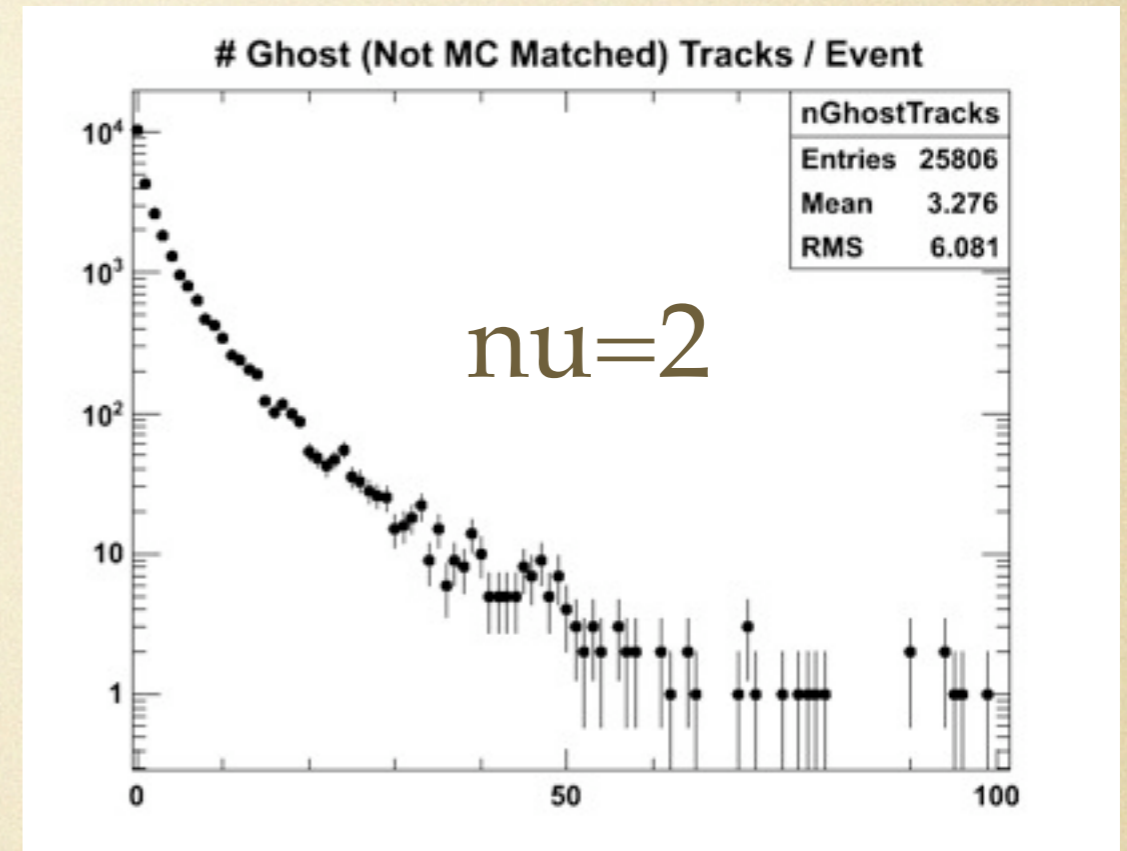
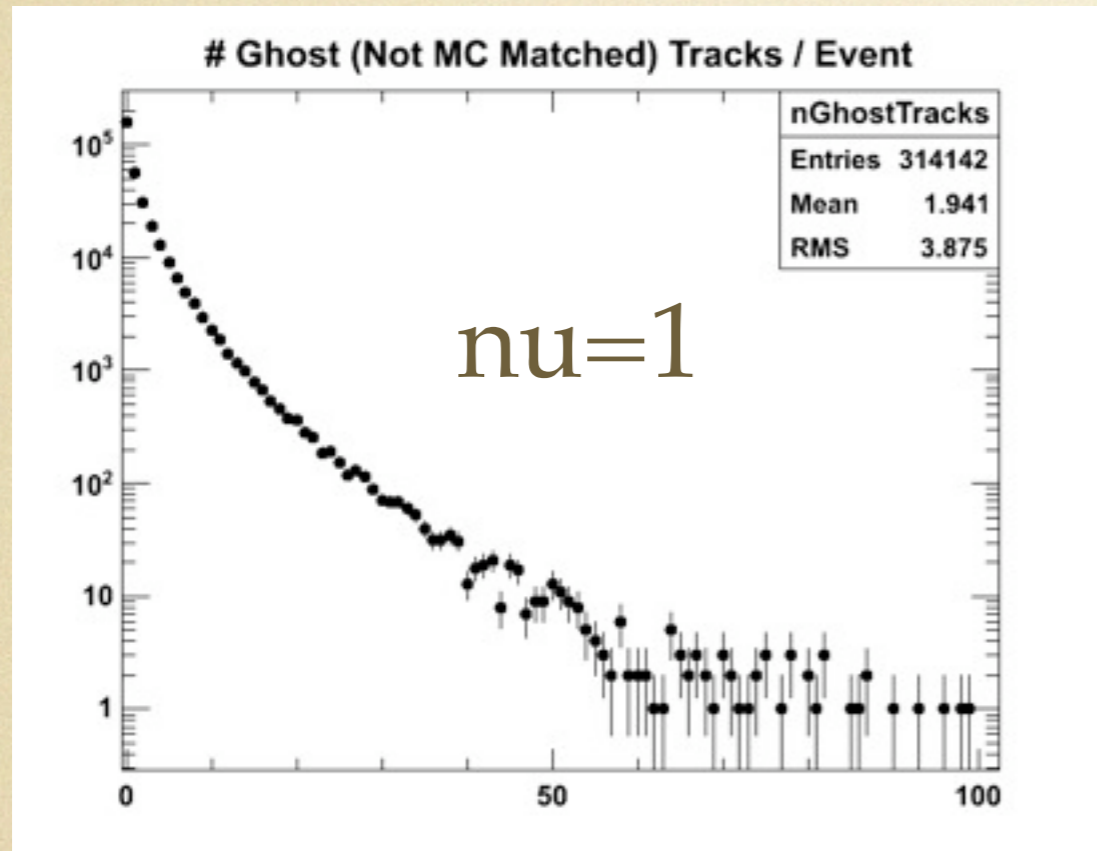
PID @ Higher Luminosities

(Preliminary)

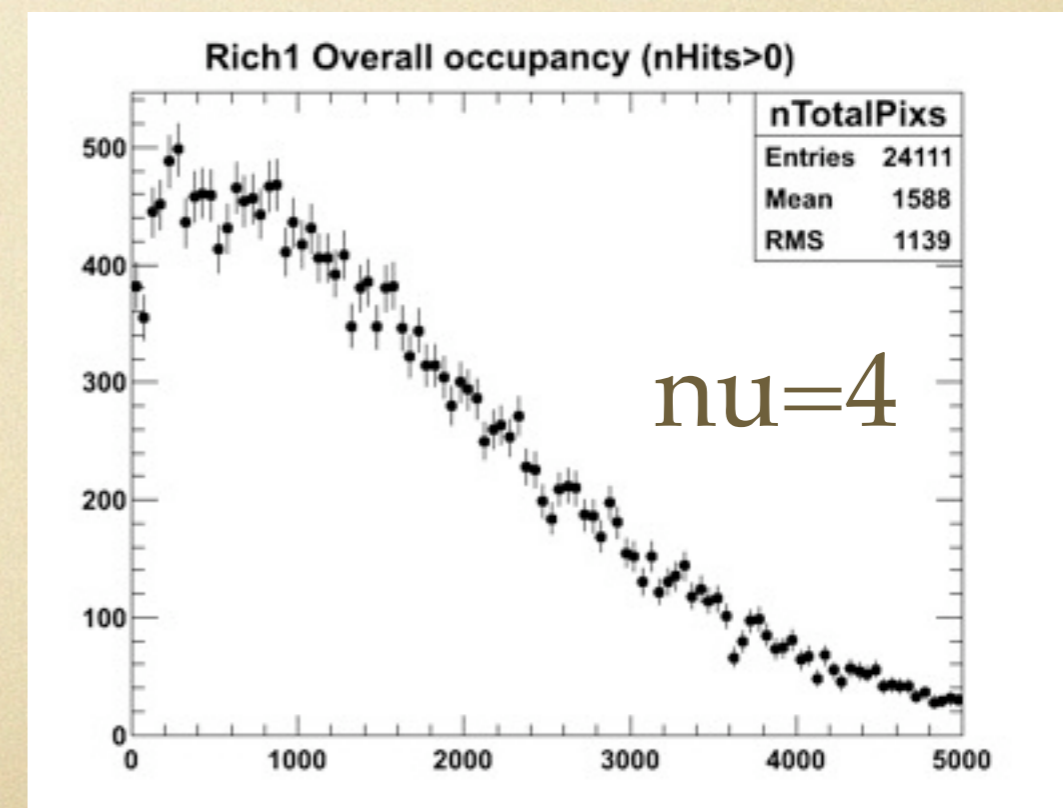
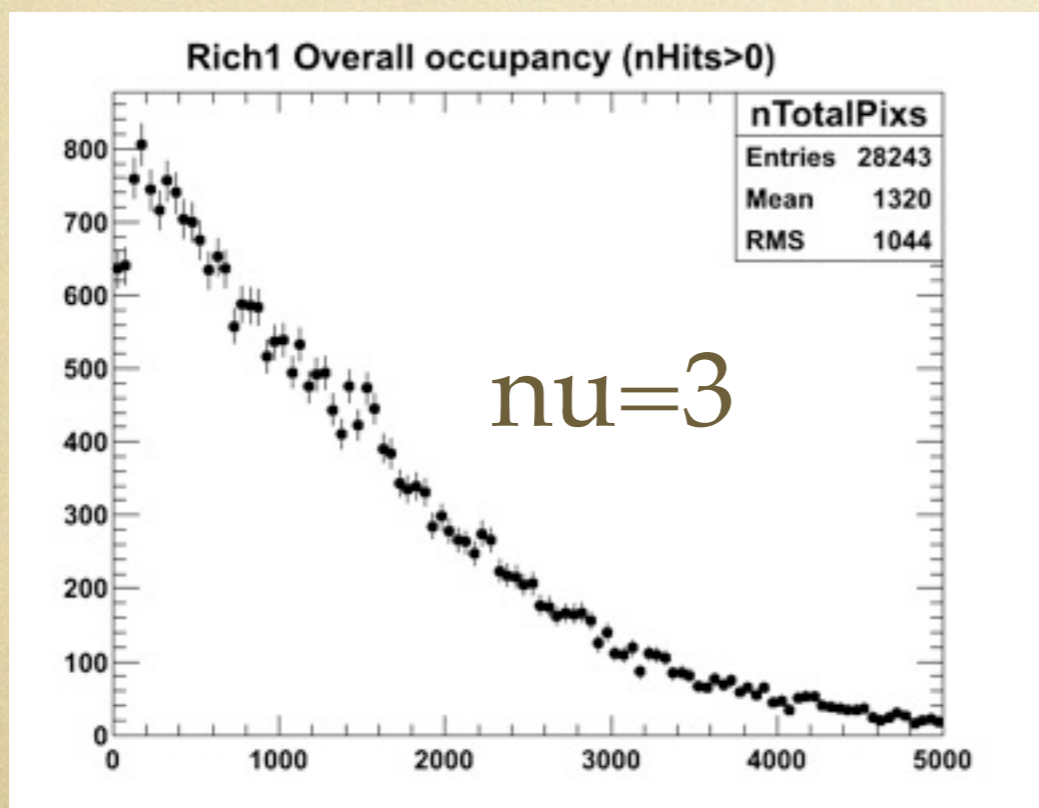
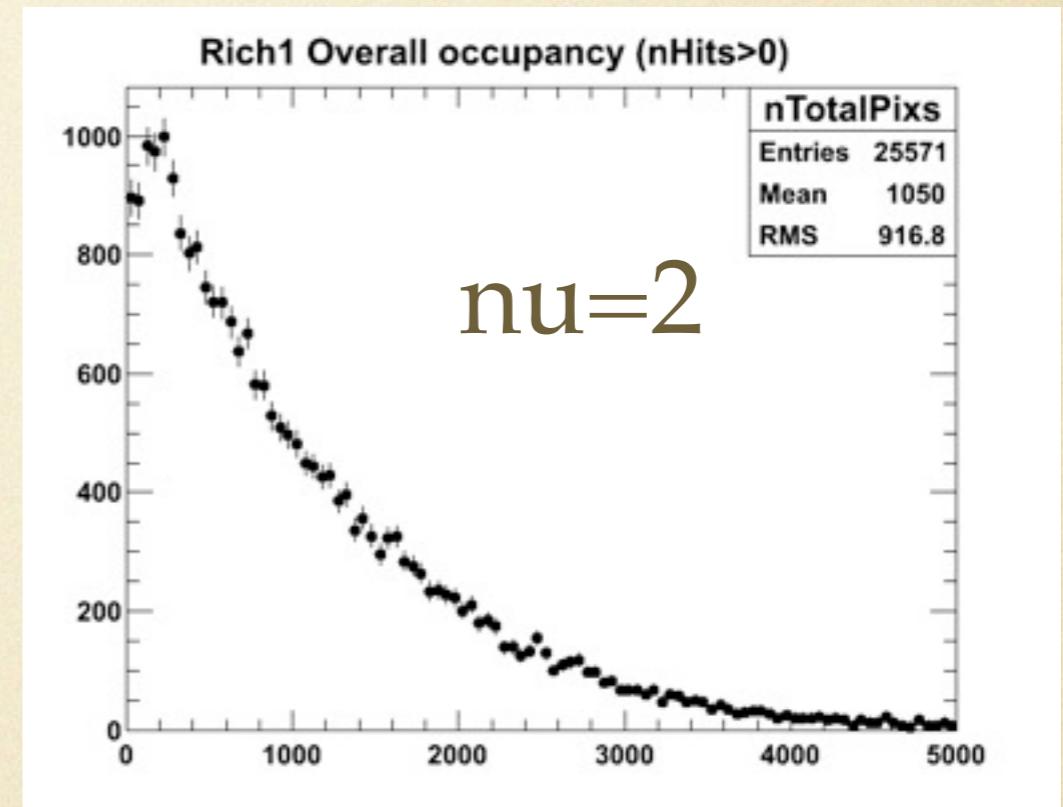
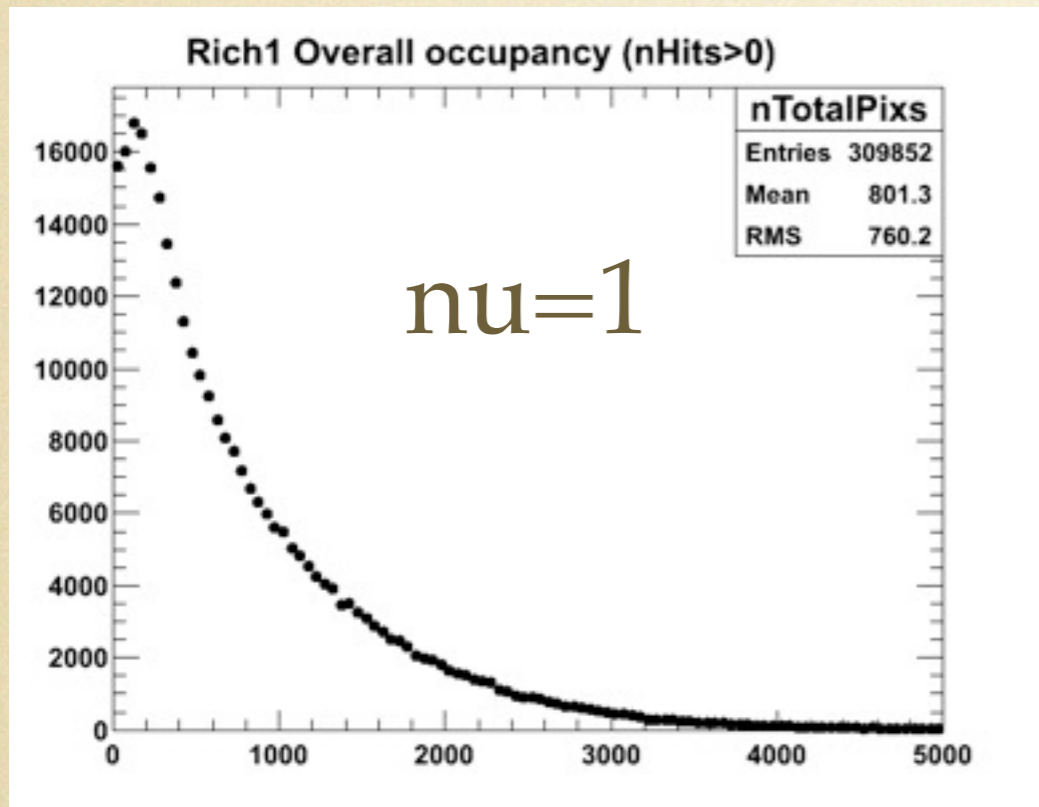
(Real) Track Multiplicity



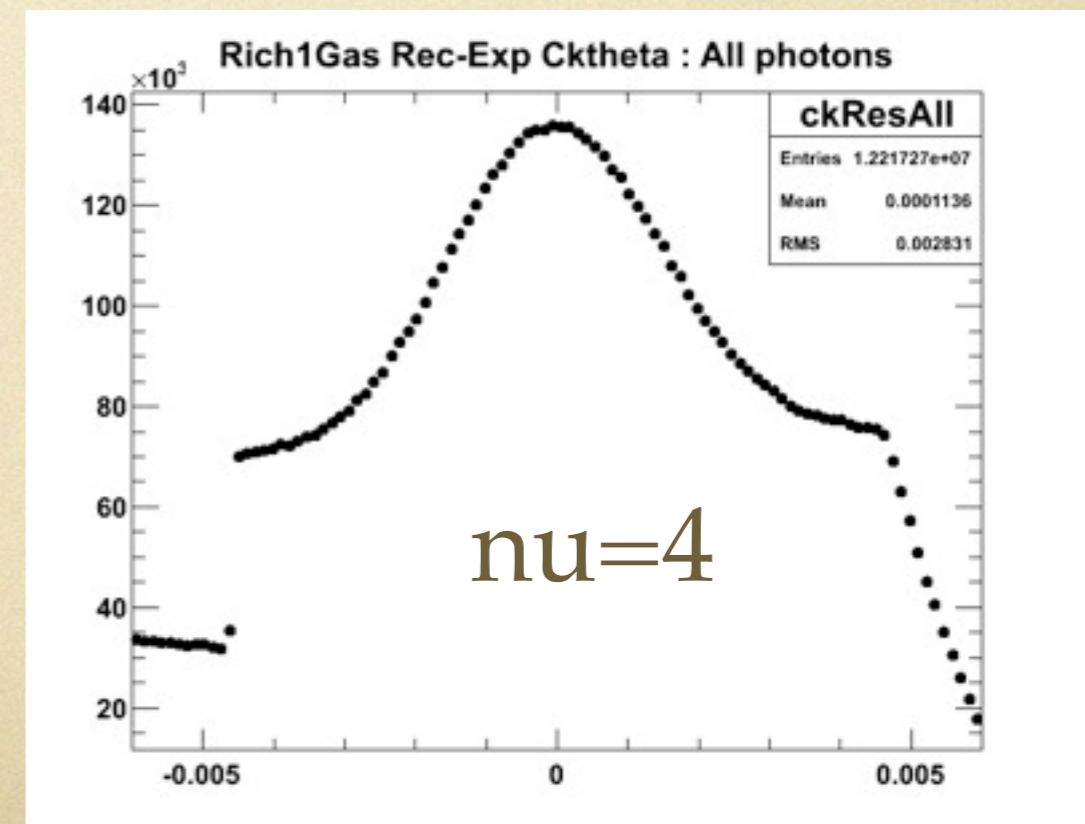
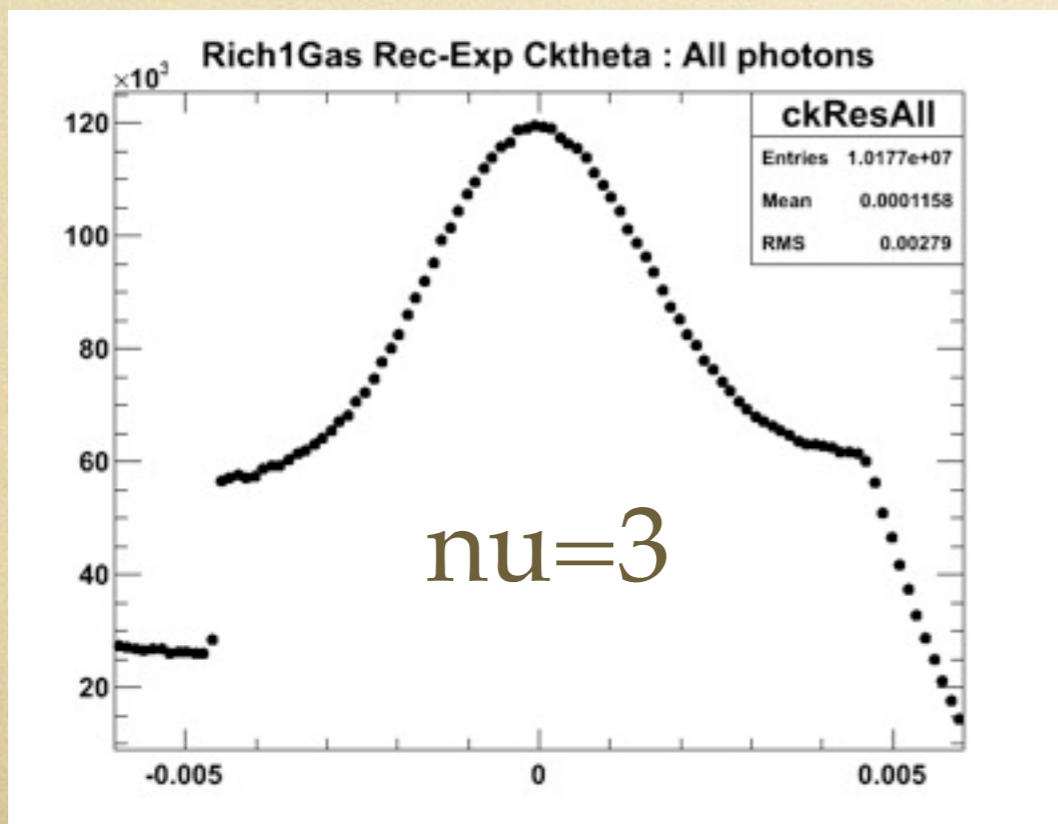
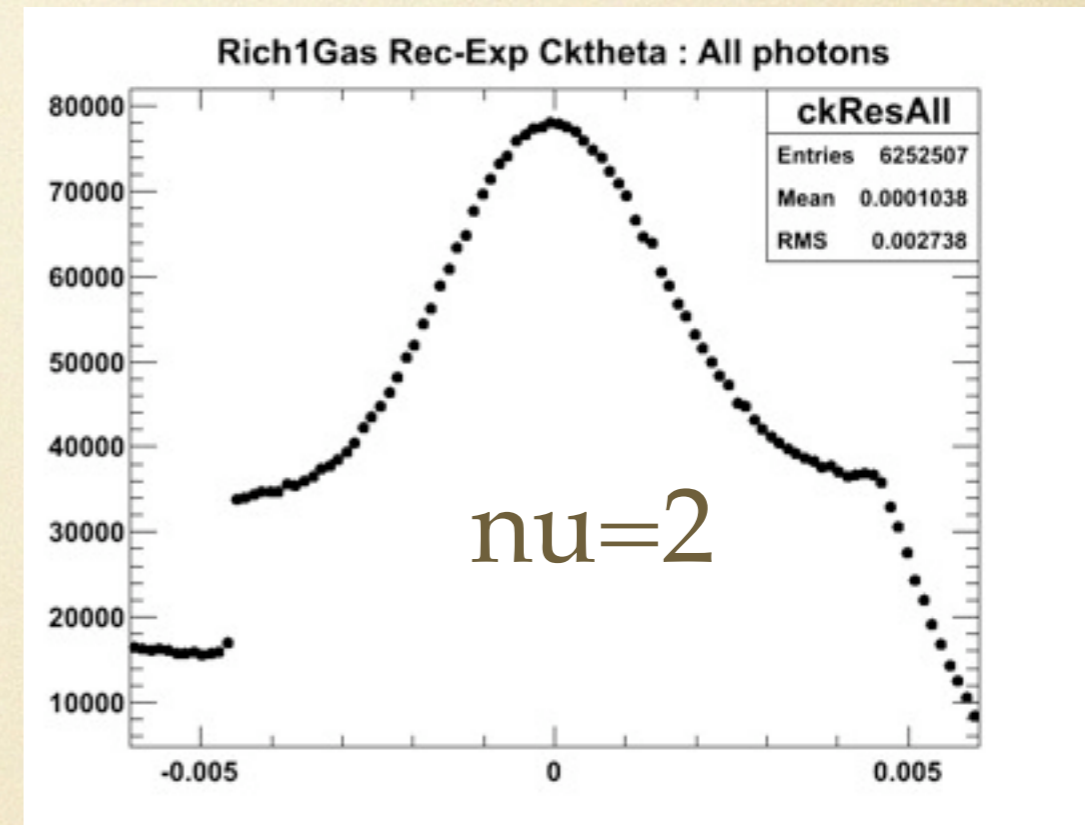
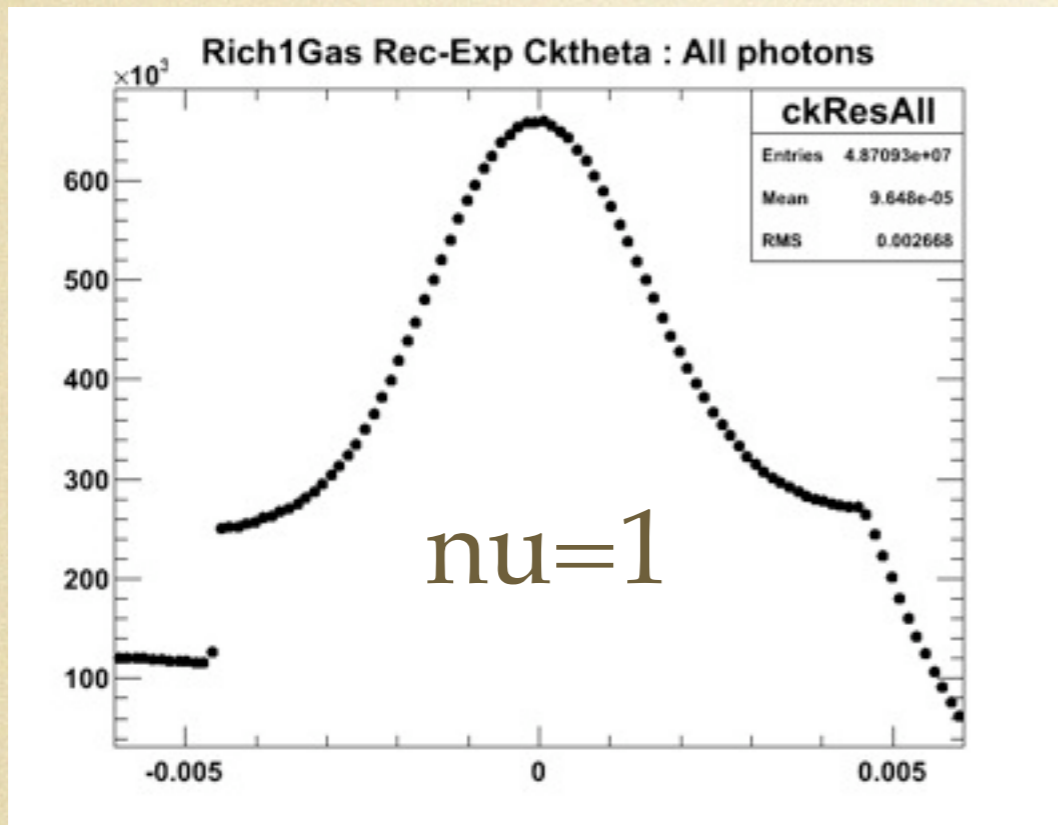
Ghost Track Multiplicity



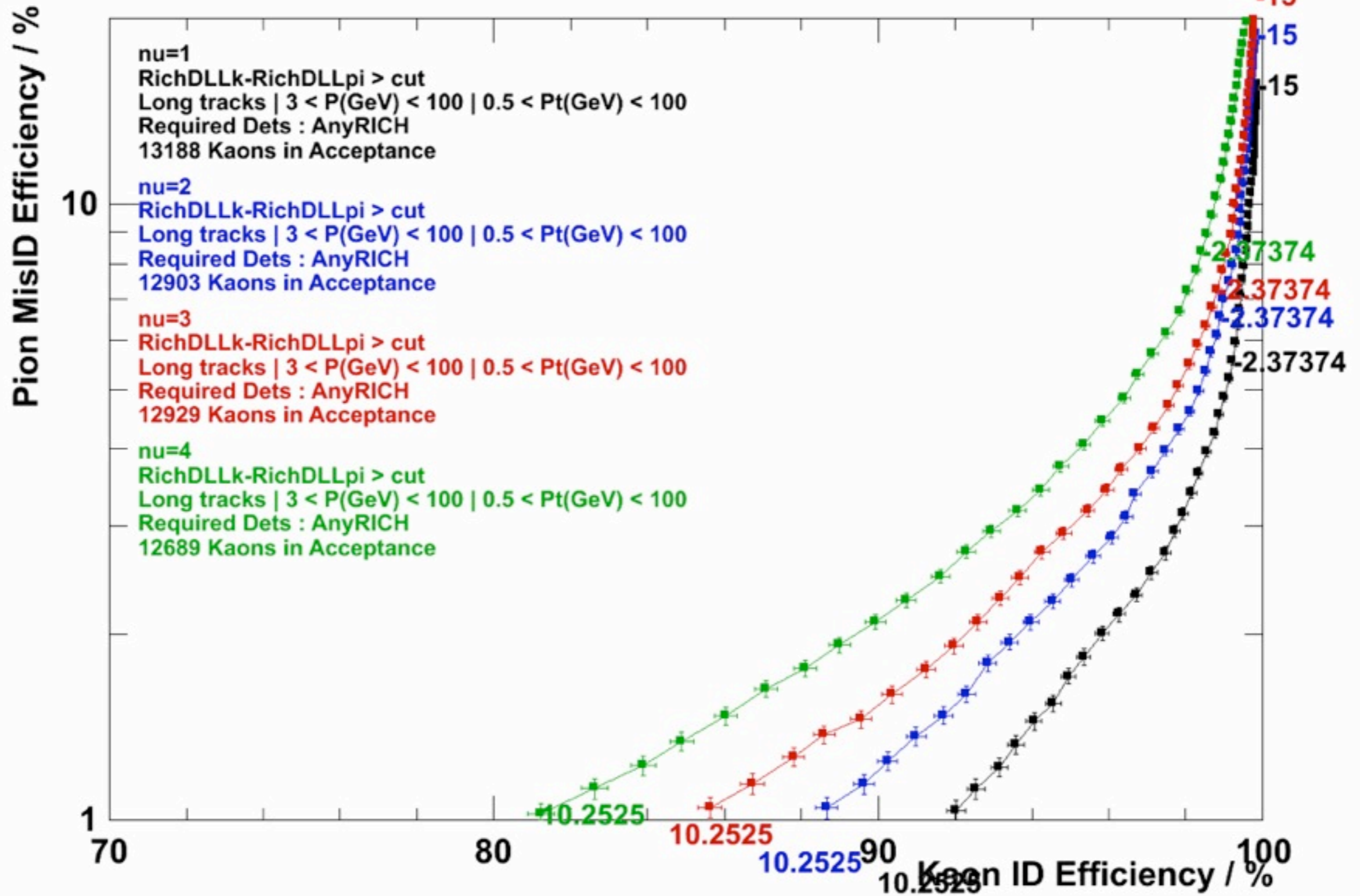
RICH1 Occupancy



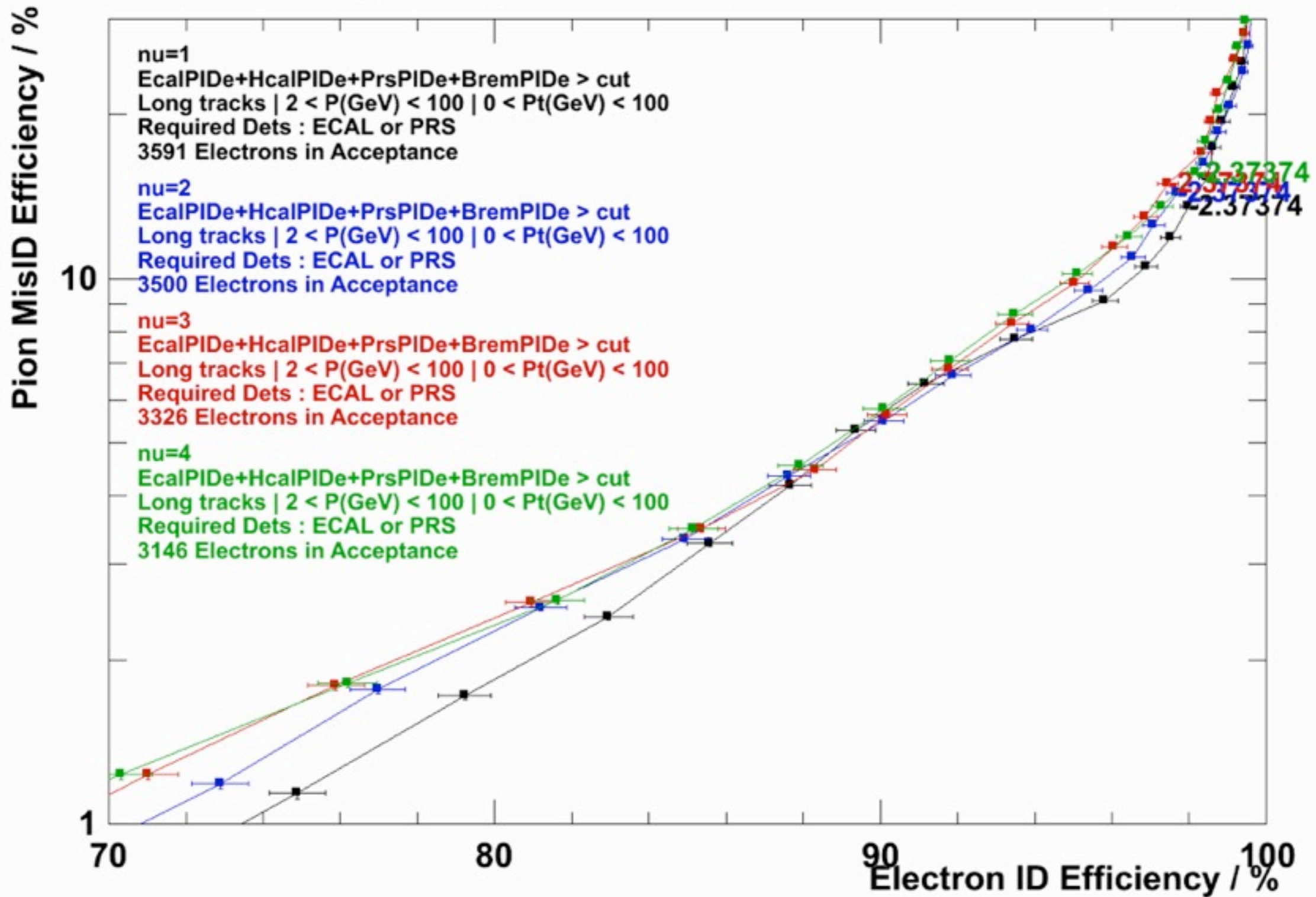
C₄F₁₀ Resolution



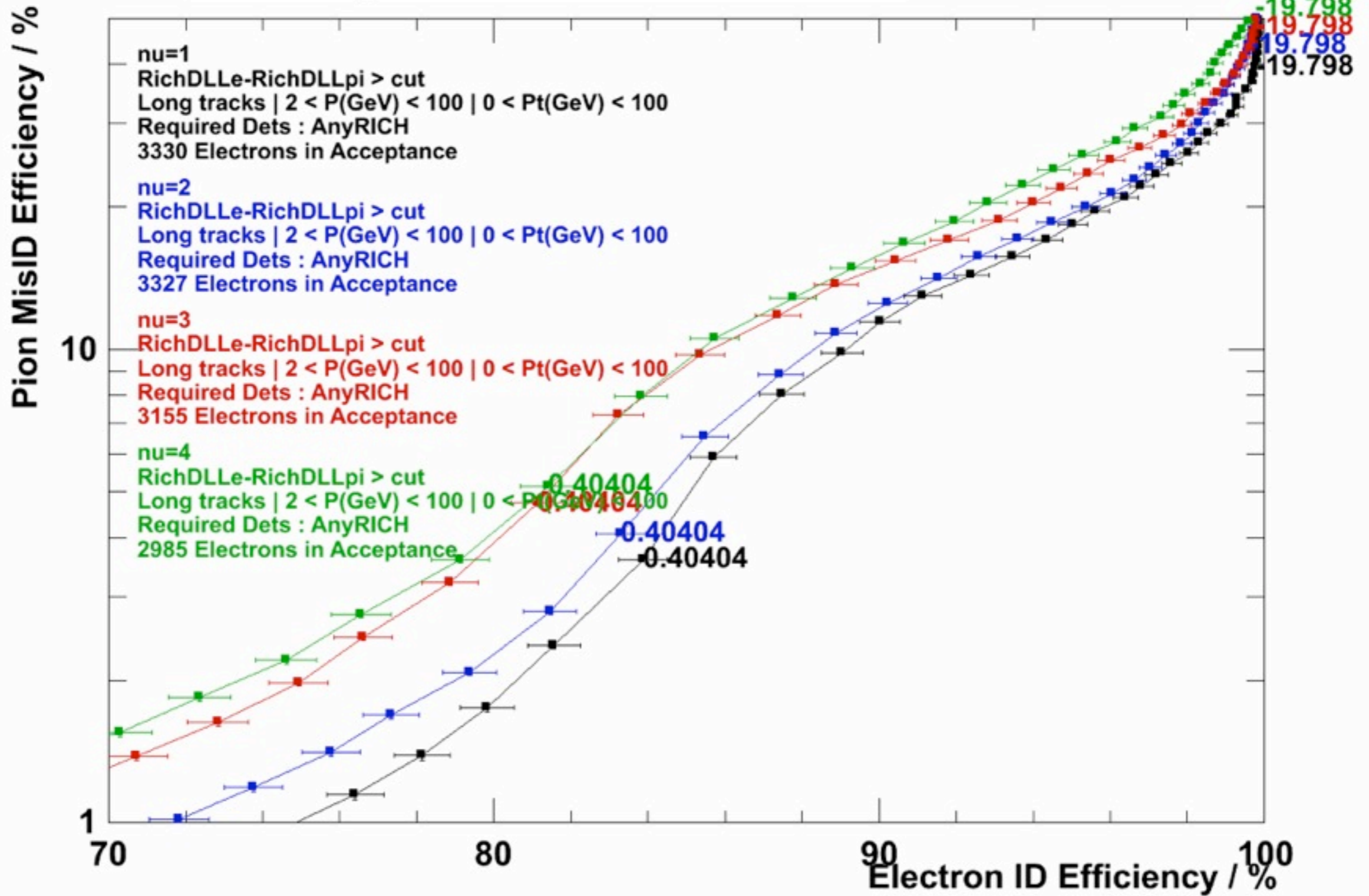
RICH Kaon ID : MC09



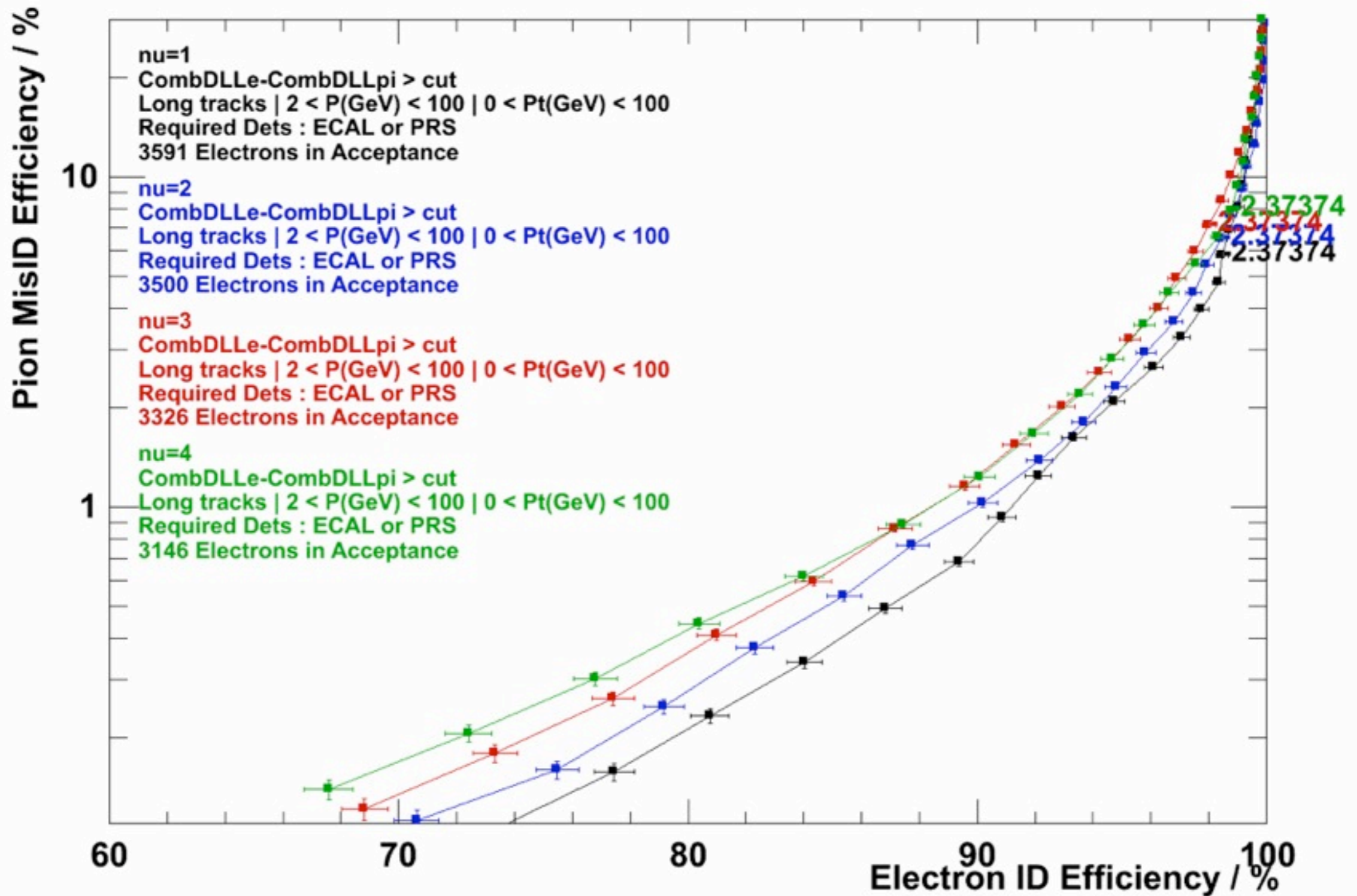
Calo-System Electron ID : MC09



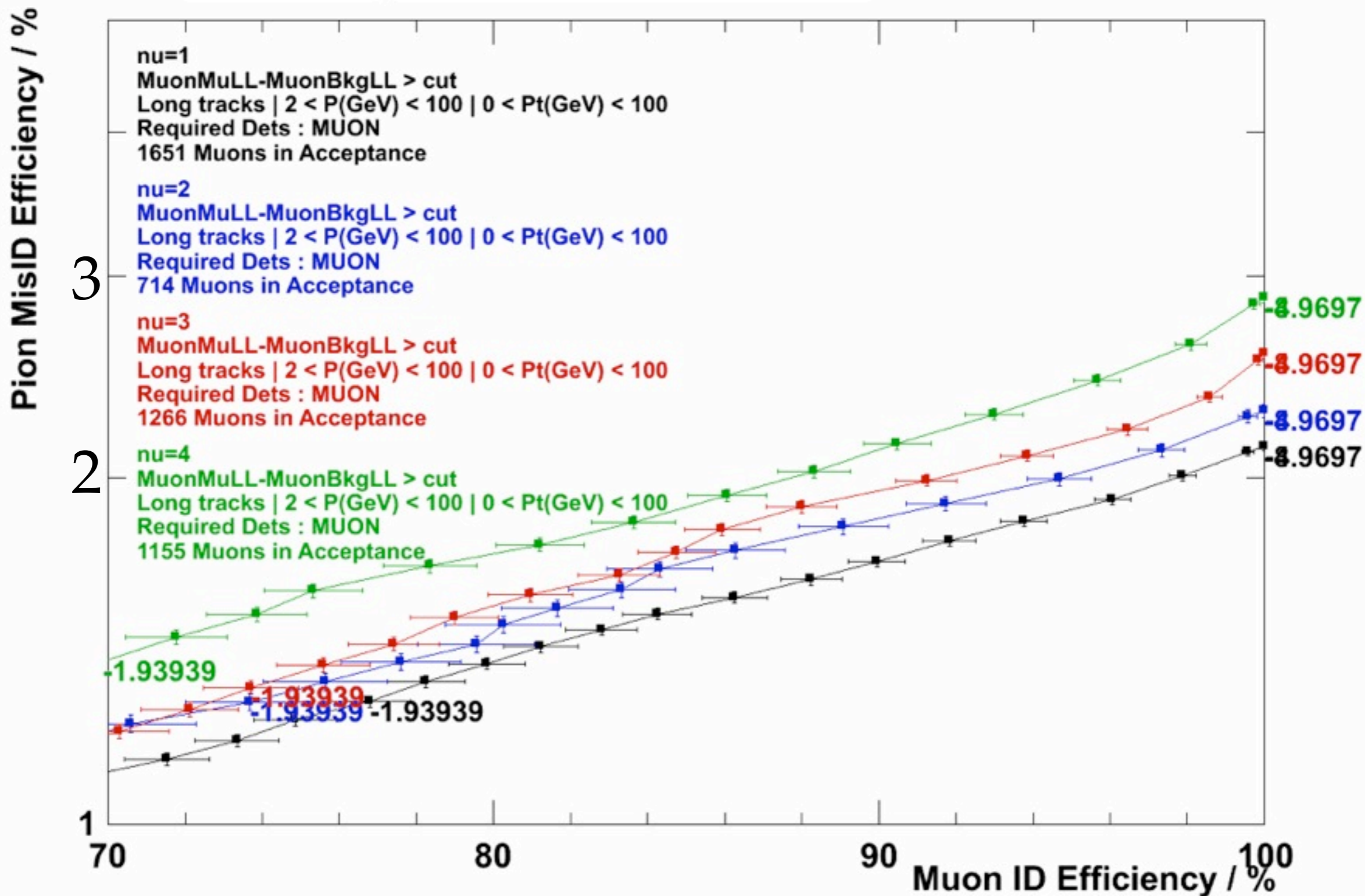
Rich-System Electron ID : MC09



Combined Electron ID : MC09

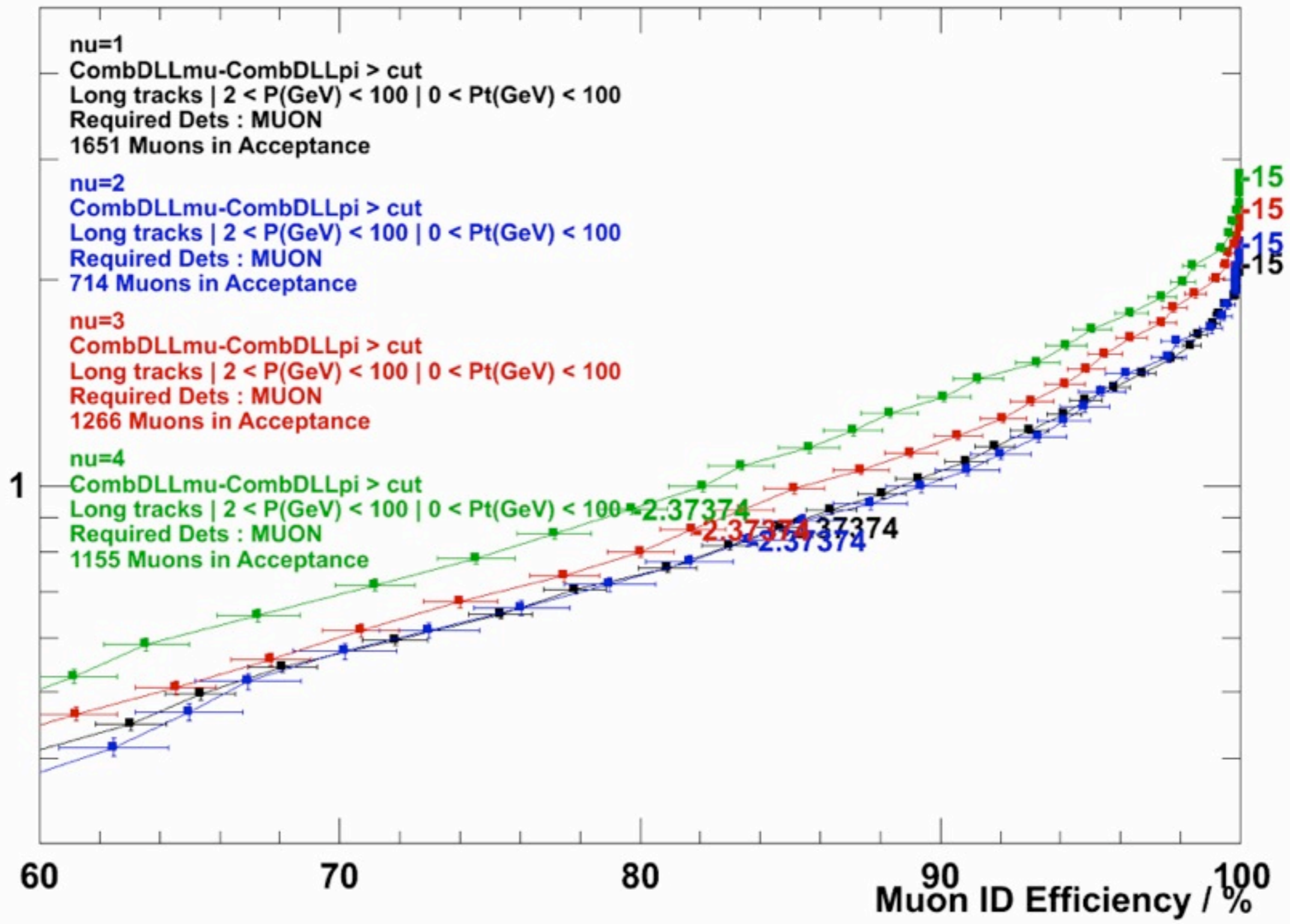


Muon-System Muon ID : MC09



Combined Muon ID : MC09

Pion MisID Efficiency / %



Conclusions

- Performance in MC09 comparable to DC06
- Increase in detector realism matching better software
 - DLL distributions may differ though.
 - Requires some retuning of cuts.
- Initial studies show PID Performance (slightly) degrades as luminosity increases
- Preliminary results only - More detailed studies now starting within sub-detector groups