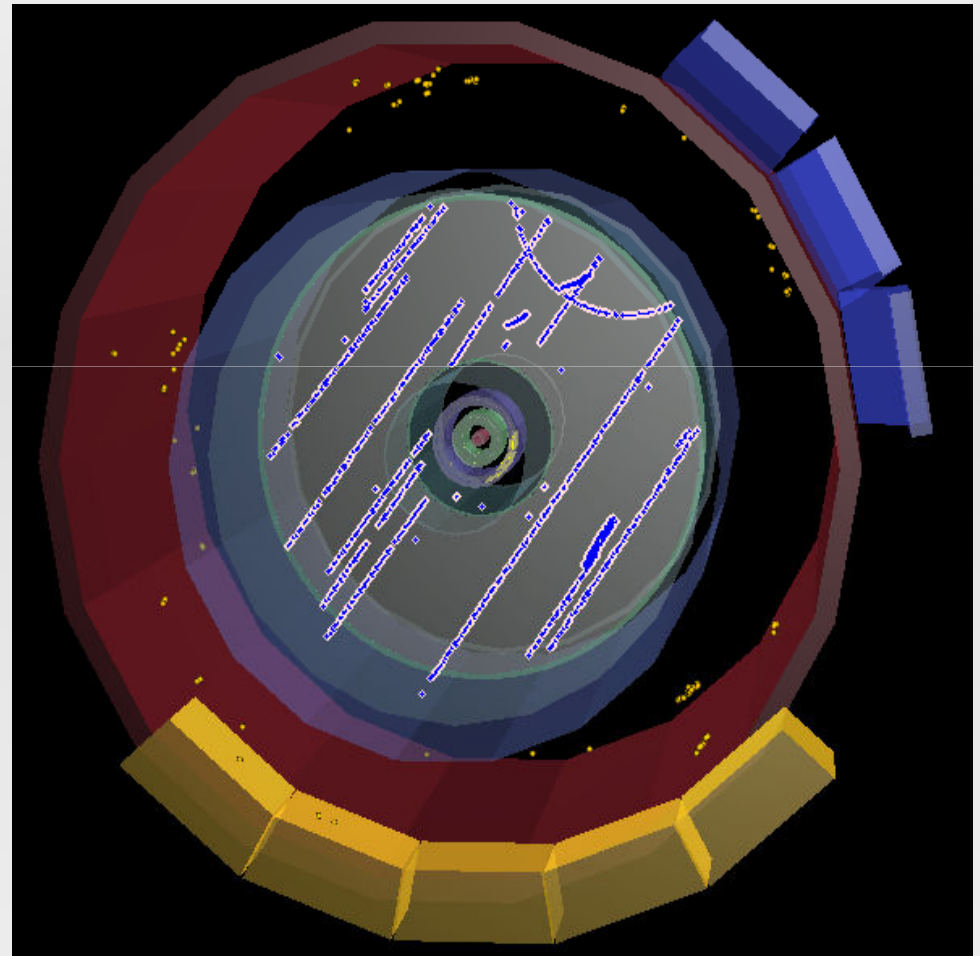
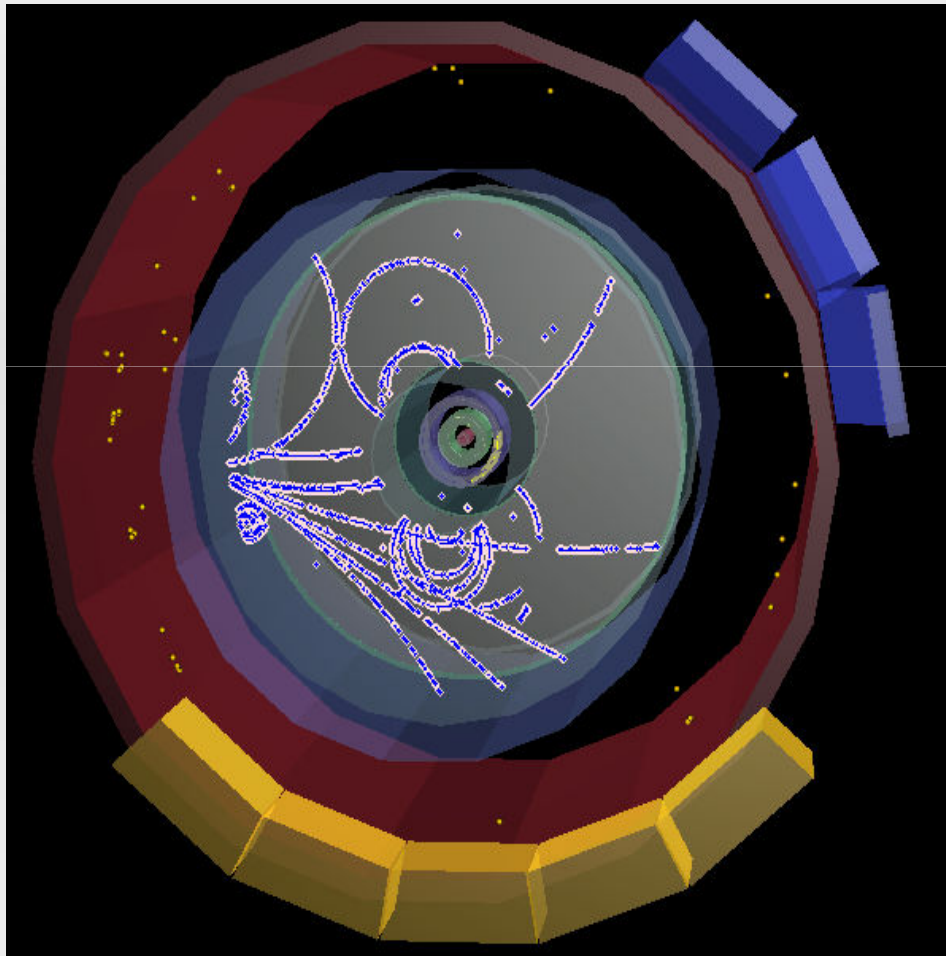


# Cosmic Muons Analysis



# Summer Data Taking 2009

We are interested in Runs with  $B = 0.5$  T

Period of data taking ( $B=0.5$  T) :

25-31 August

02-09 September

Good runs with ESD reconstruction :

**83802 83775** 83871 **85024** 85032 total time ~ 6h

**85034** long run with problems total time ~ 10h

# Runs Analyzed

83802 32 chunks 02/09/2009 22:04 23:09 65min 43s

Tot. Ev. : 423636 Analyzed: 30 chunks ~60 min

Events: 385373 Status: Good

83775 162 chunks 02/09/2009 18:45 20:13 87min 33s

Tot. Ev: 599573 Analyzed: 146 ~ 78 min

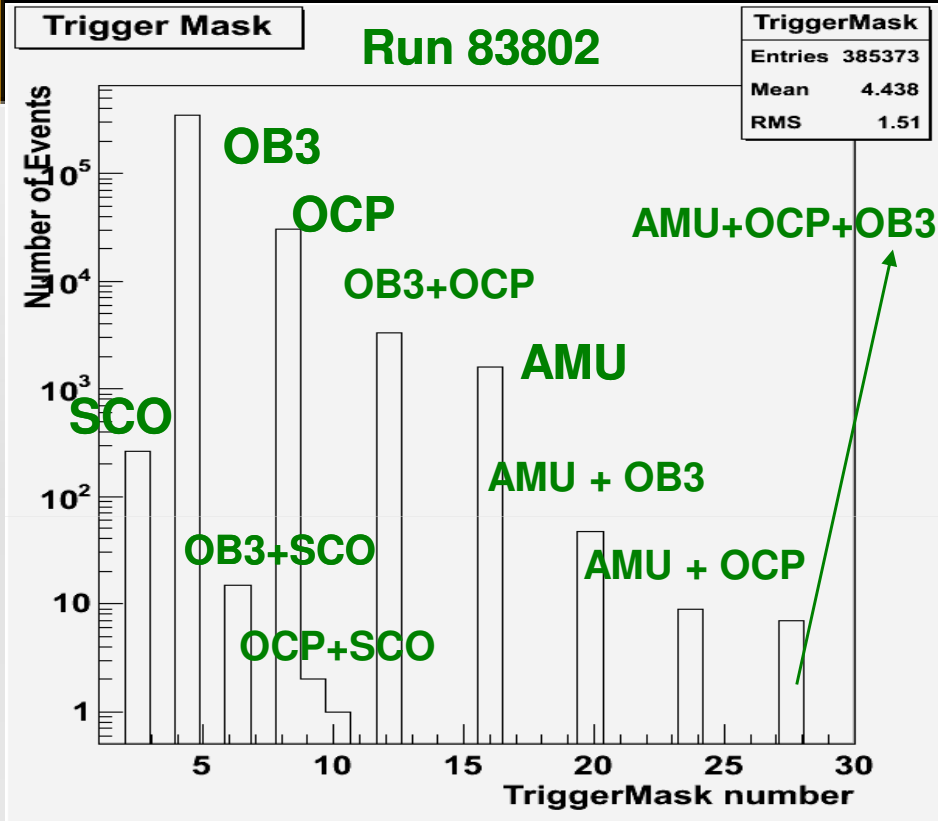
Events: 532385 Status: Good

85024 68 chunks 08/09/2009 18:05 19:41 95min 33s

Tot. Ev: 616714 Analyzed: 66 ~ 92.5 min

Events: 596564 Status: Good

# Triggers

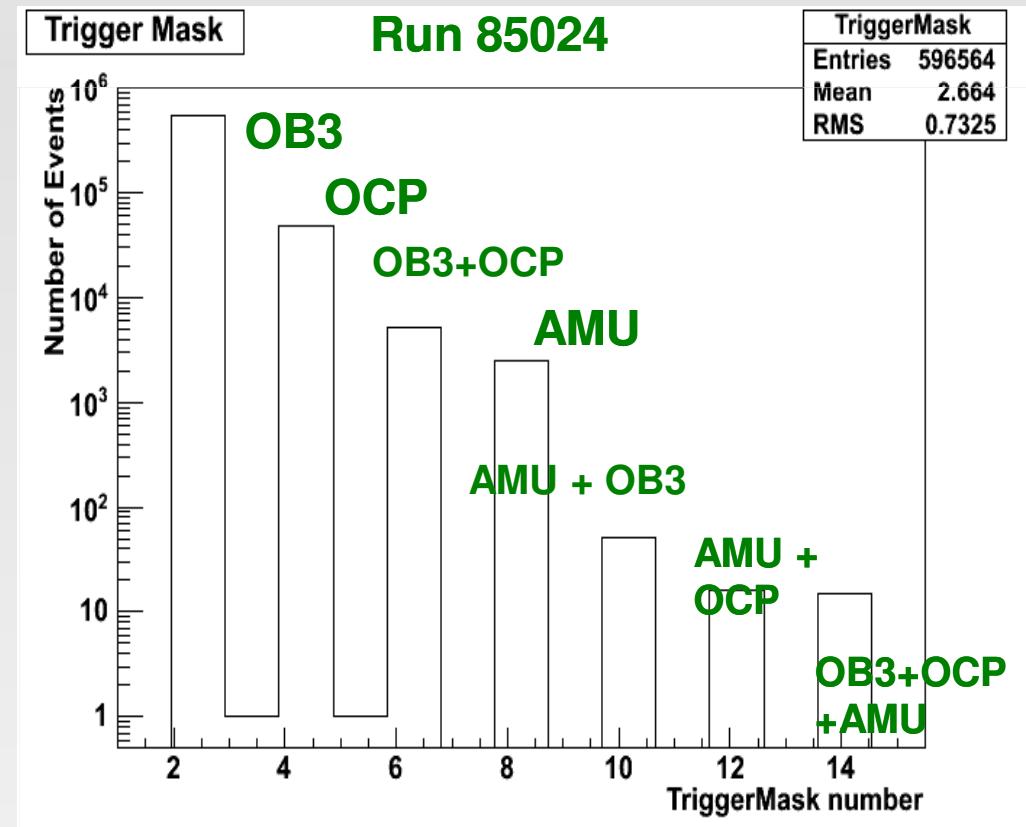


**AMU = ACORDE MULTIMU**

**OB3 = TOF Back-Back +/- 3**

**OCP = TOF Cosmic Physics**

**SCO = SPD**



# Triggers rate

## Run 83802

Trigger Events Ev.mu>0 Purity(%) Trigger rate(Hz) Purity rate(Hz)

AMU	1663	102	6	0.5	0.03
OB3	352589	73890	21	98	20
OCP	33934	3840	11	9	1
SCO	279	244	87%	0.08	0.07

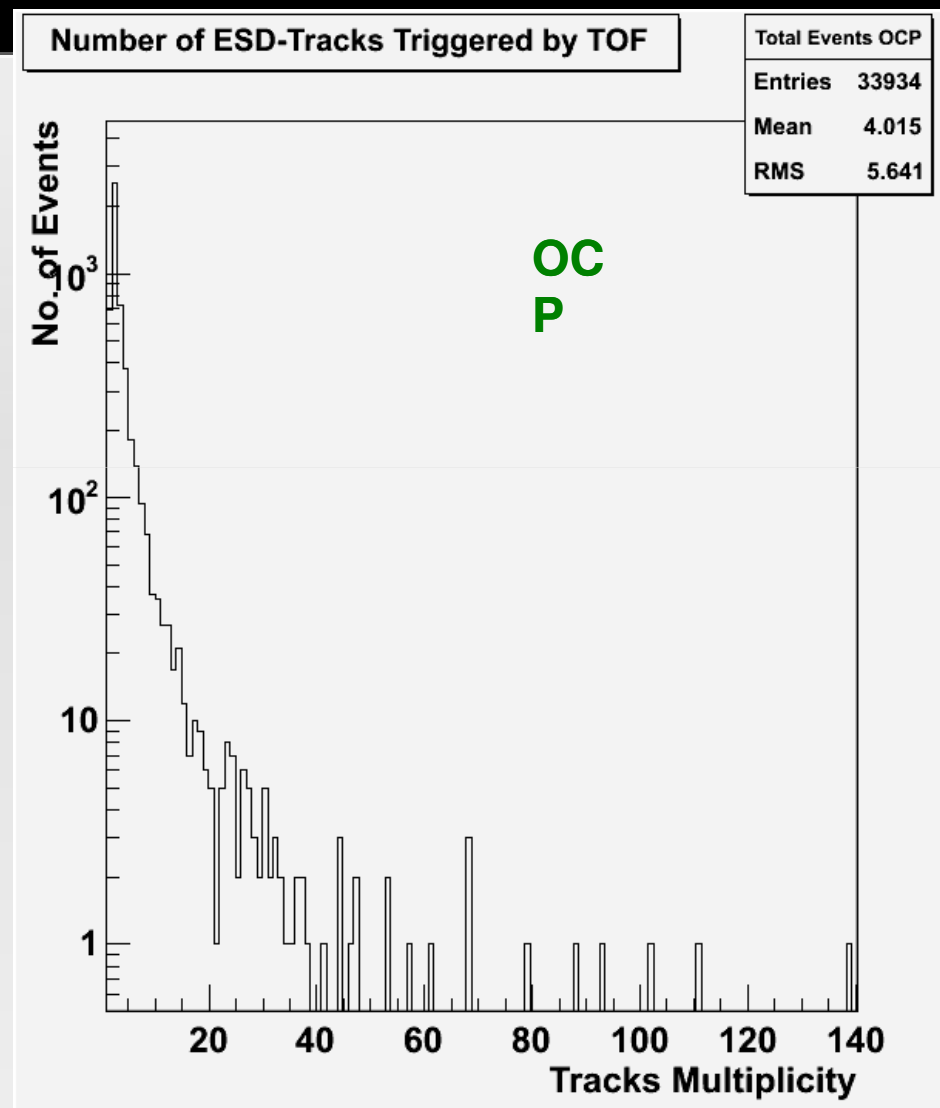
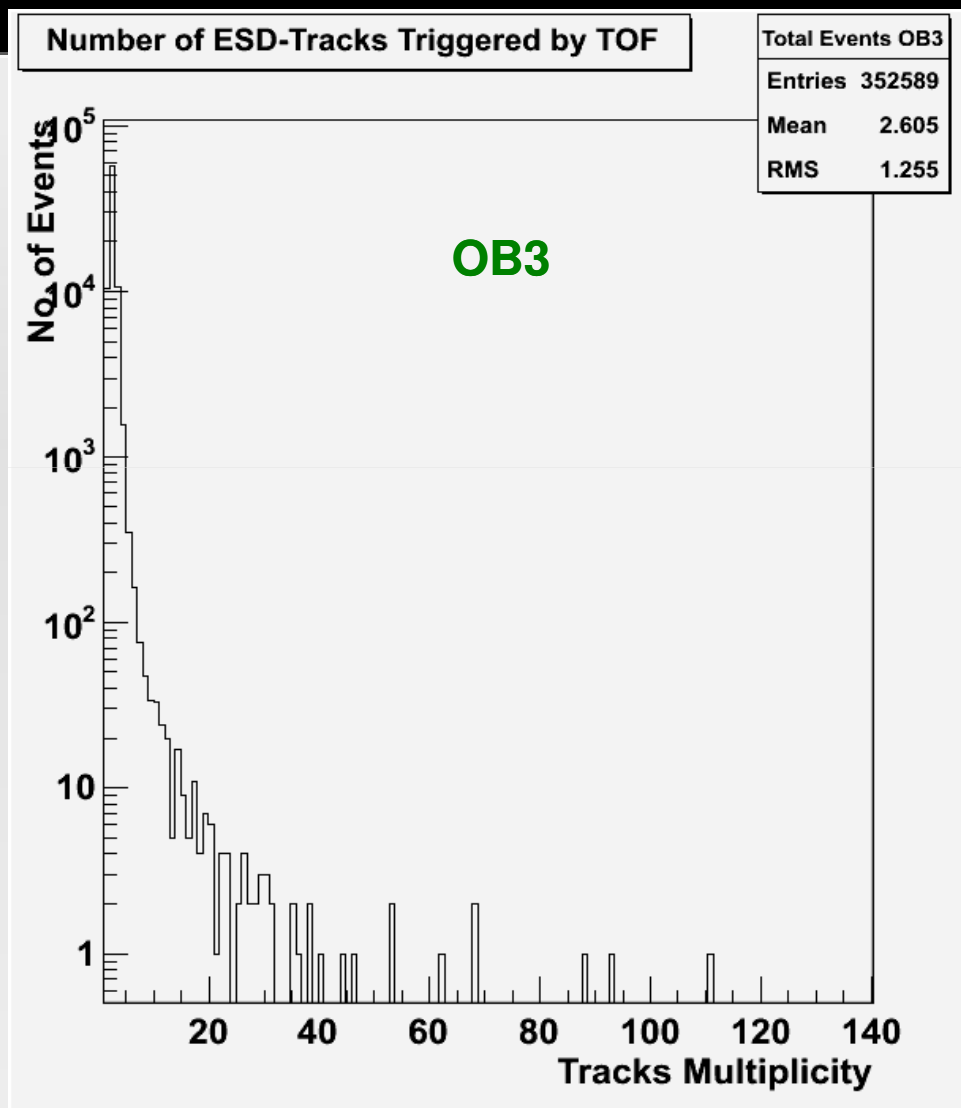
## Run 85024

Trigger Events Ev.mu>0 Purity(%) Trigger rate(Hz) Purity rate(Hz)

AMU	2577	196	8	0.5	0.03
OB3	546387	132518	24	99	24
OCP	52962	7181	13	9	1.3

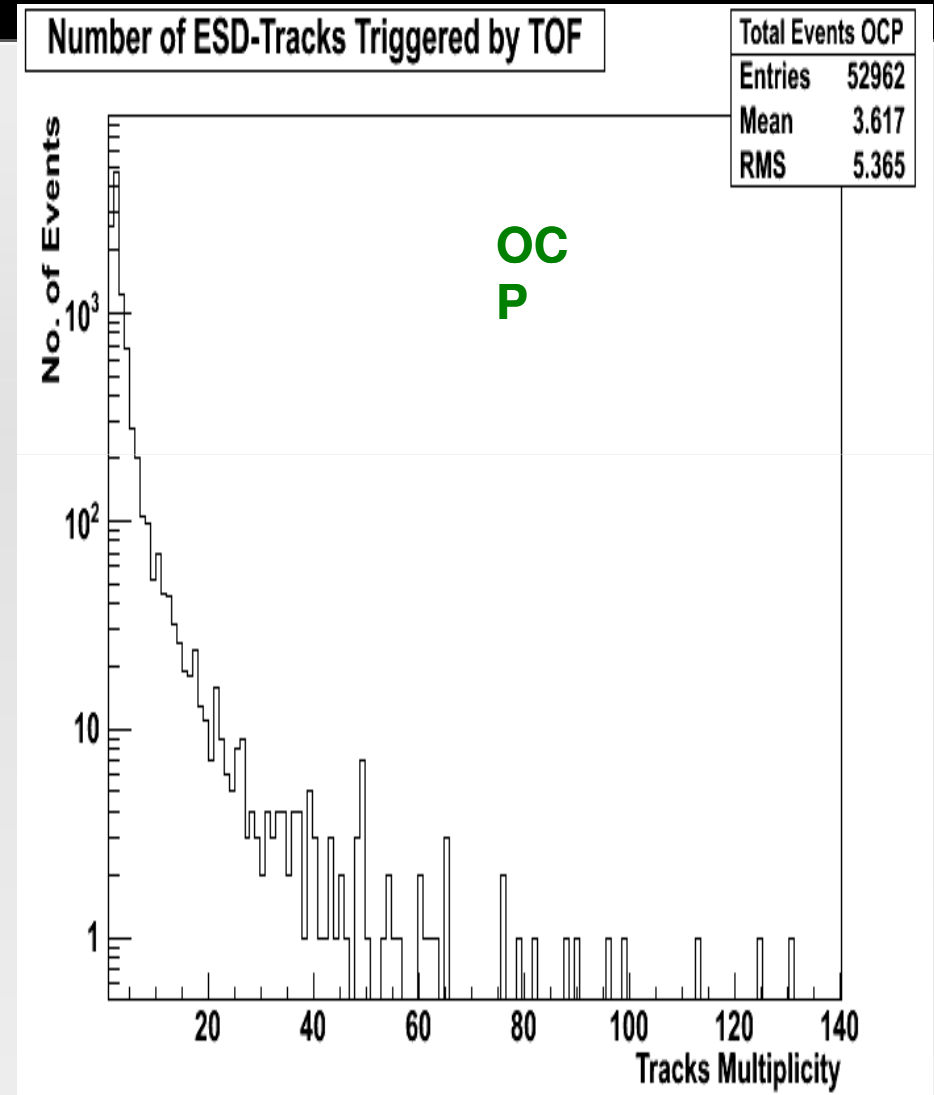
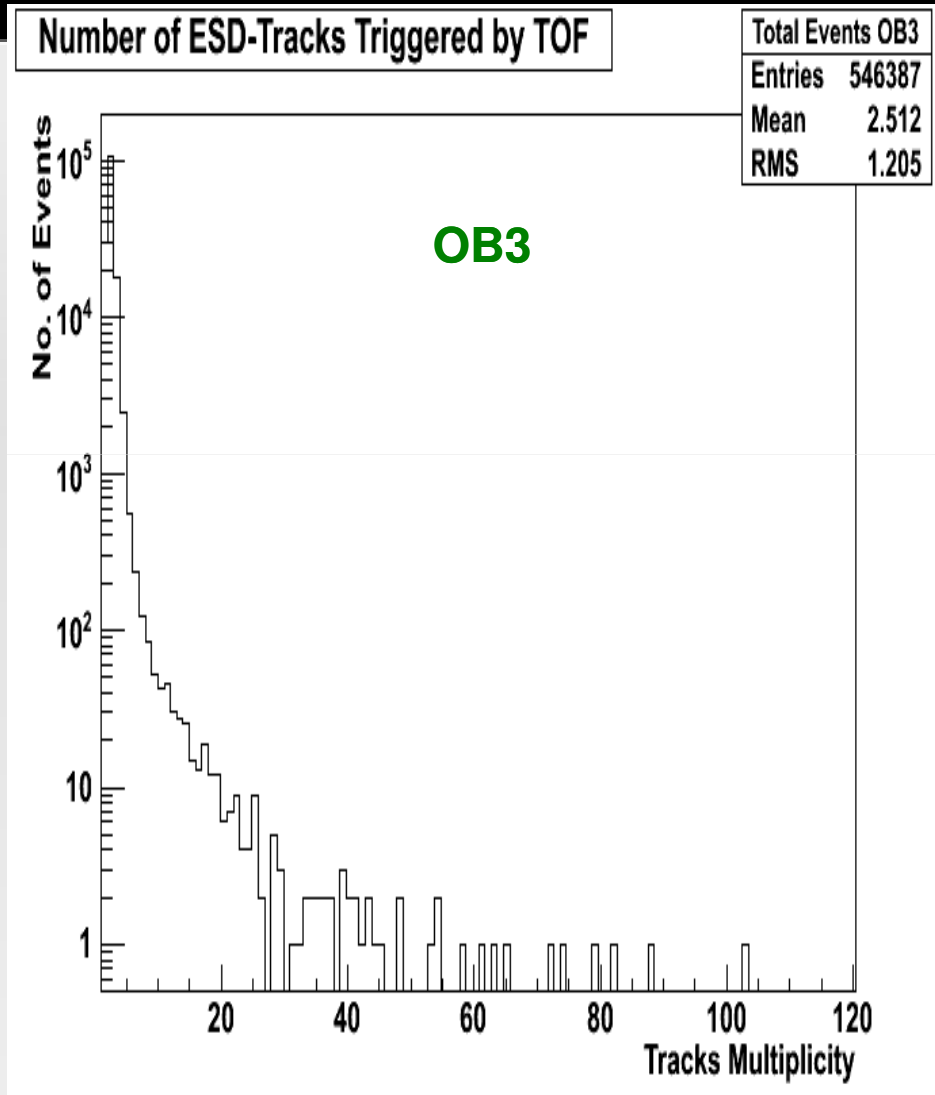
# Trigger OB3 & OCP: Tracks Multiplicity in TPC

Run 83802



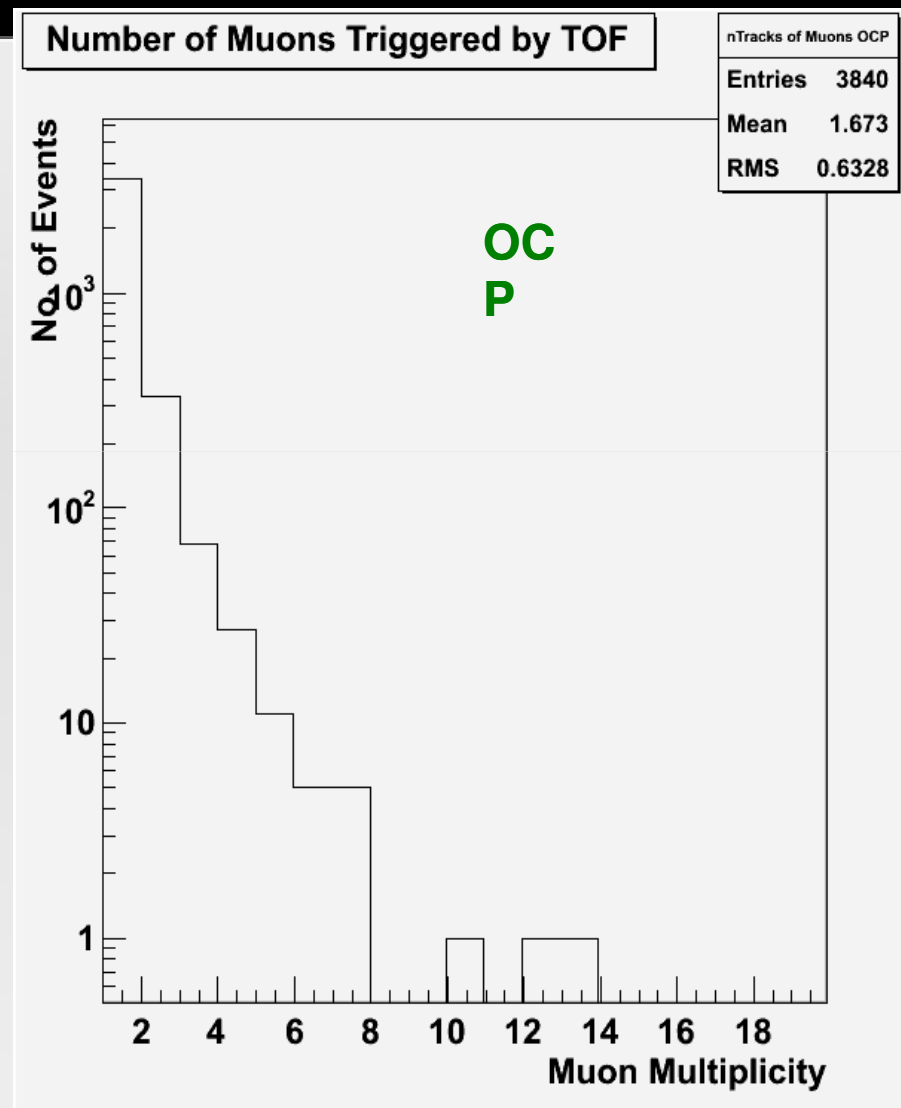
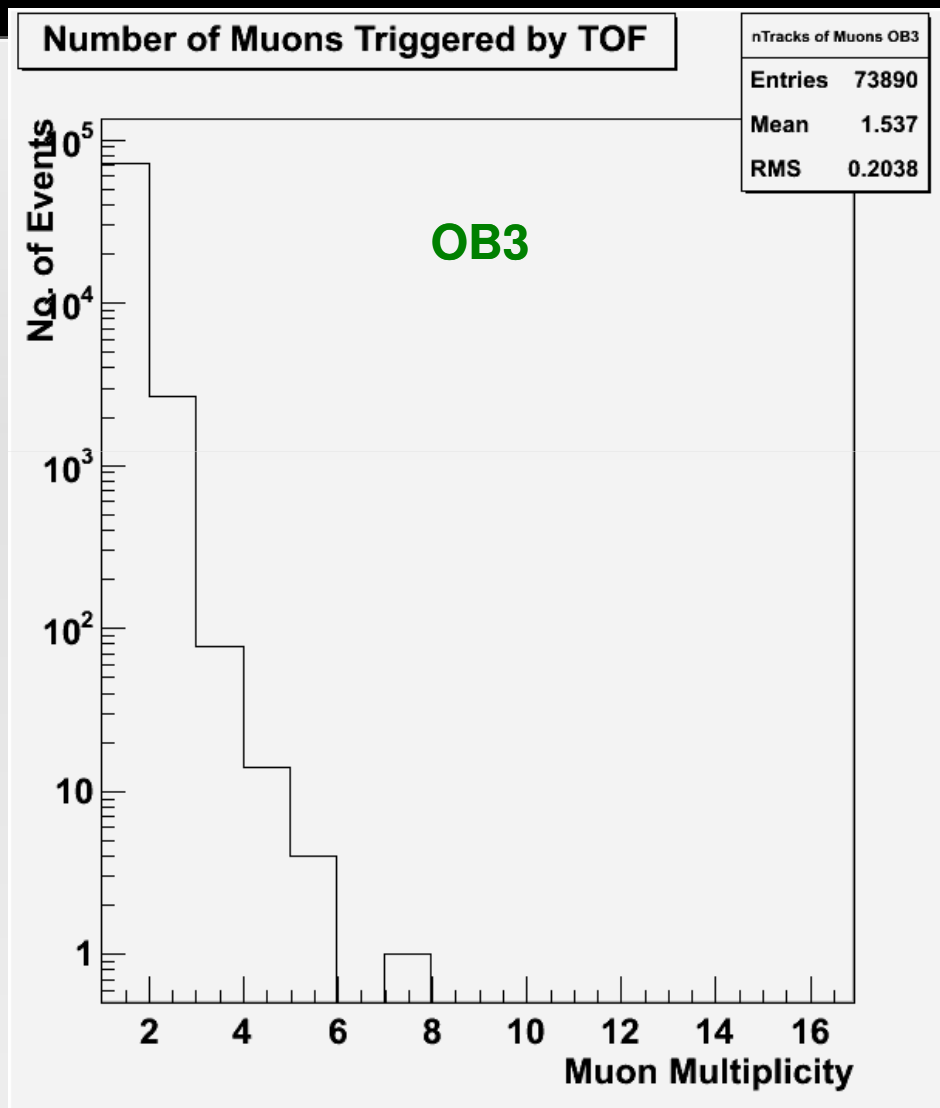
# Trigger OB3 & OCP: Tracks Multiplicity in TPC

Run 85024



# Trigger OB3 & OCP: Muon Multiplicity in TPC

Run 83802





# Trigger OB3 & OCP: Muon Multiplicity in TPC

Run 83775

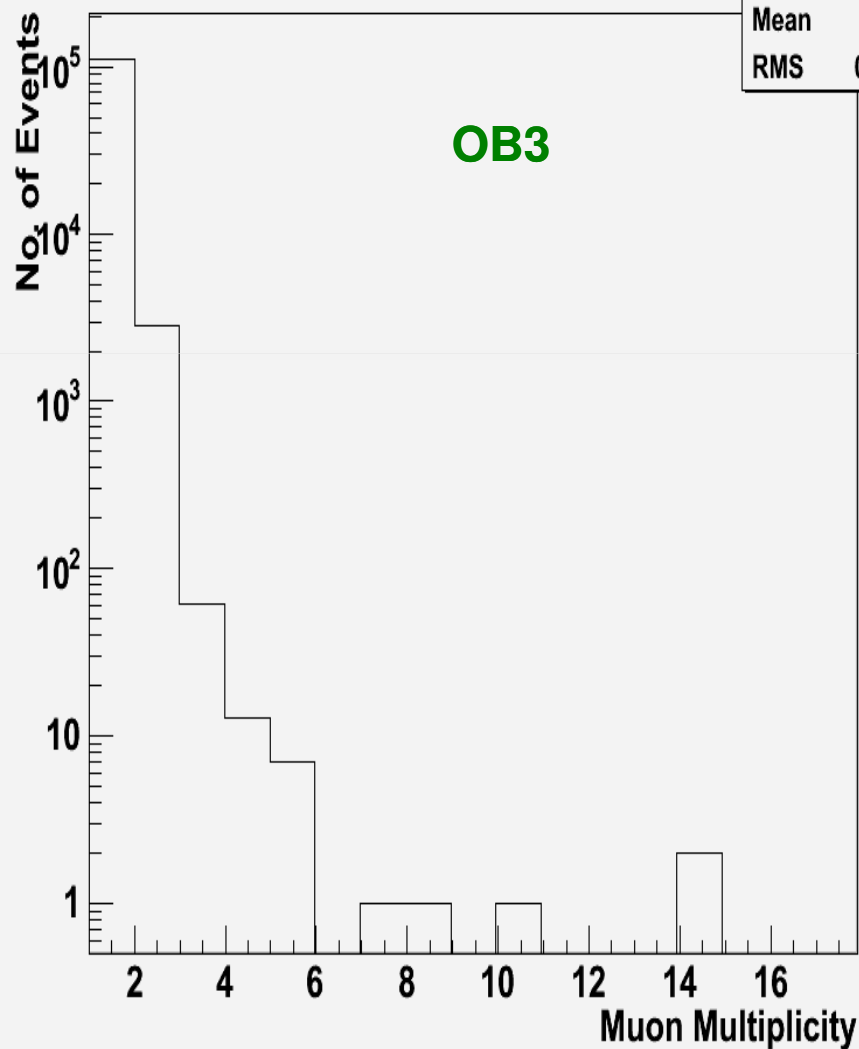
Number of Muons Triggered by TOF

nTracks of Muons OB3

Entries 112728

Mean 1.525

RMS 0.1822



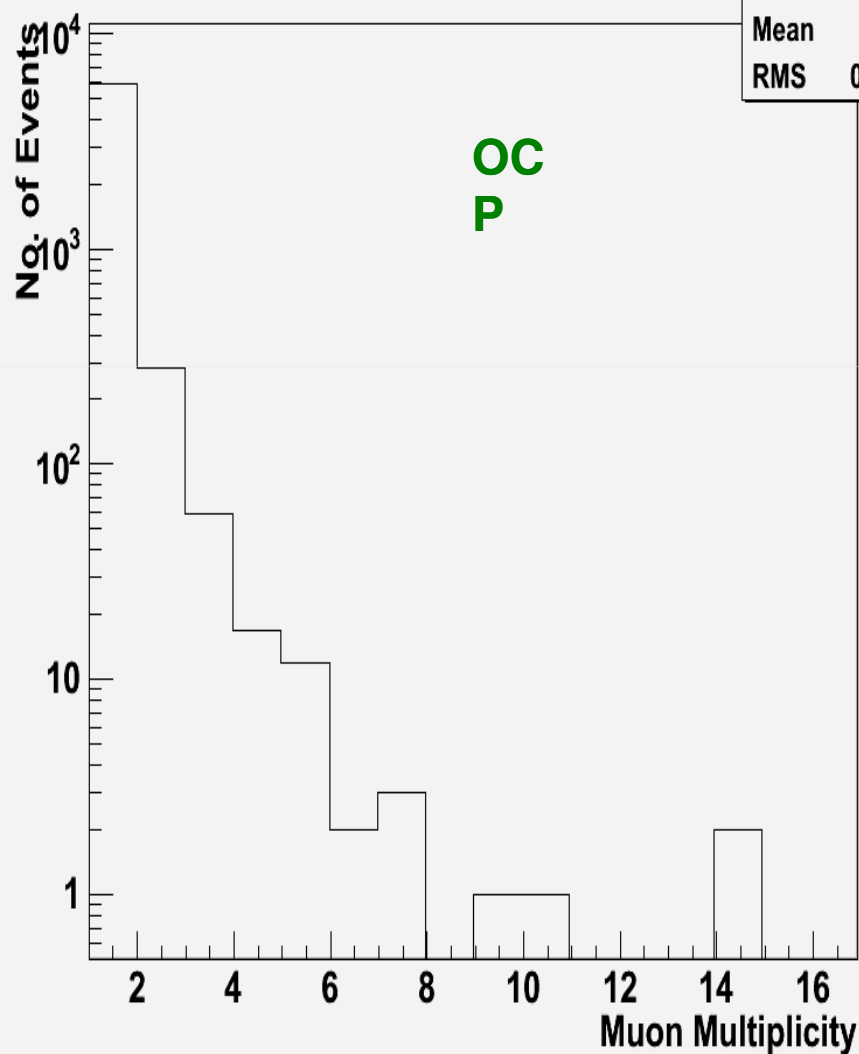
Number of Muons Triggered by TOF

nTracks of Muons OCP

Entries 6291

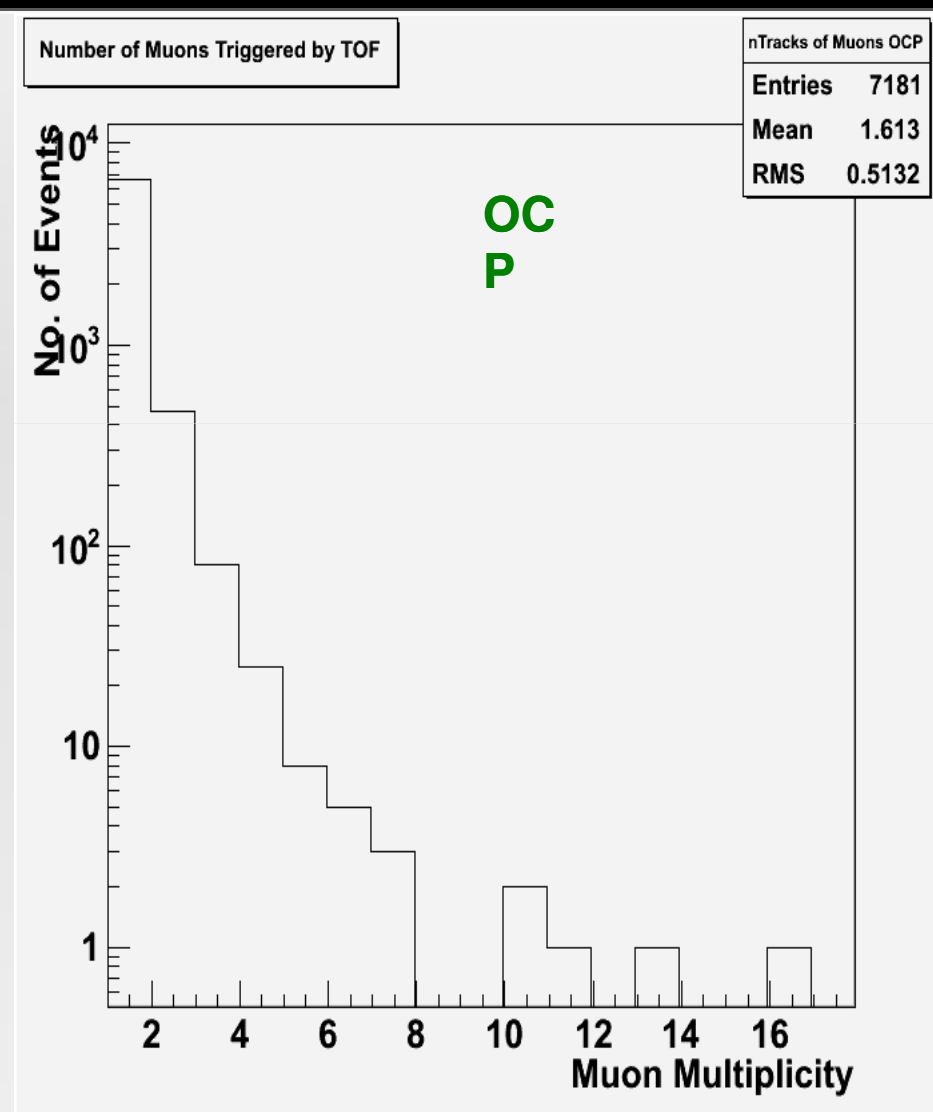
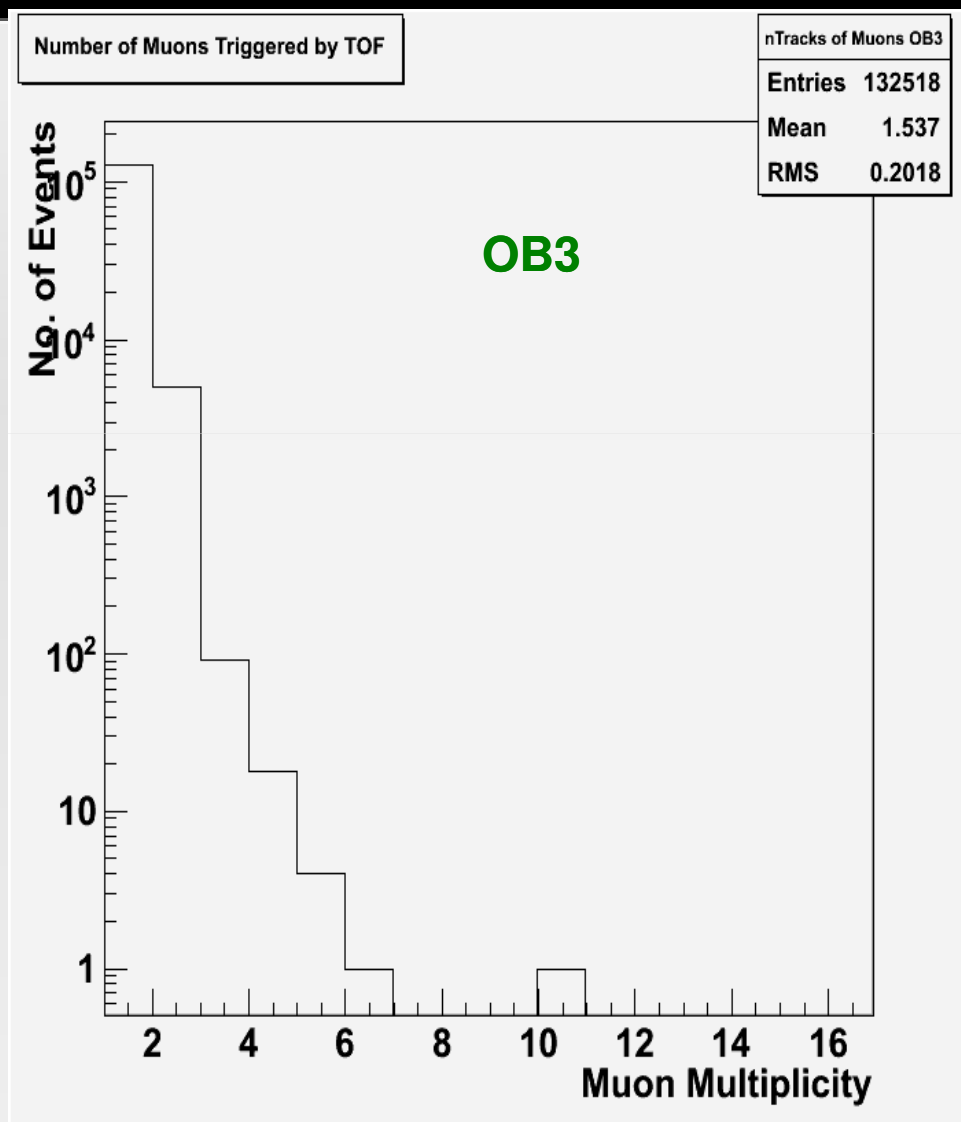
Mean 1.587

RMS 0.4779



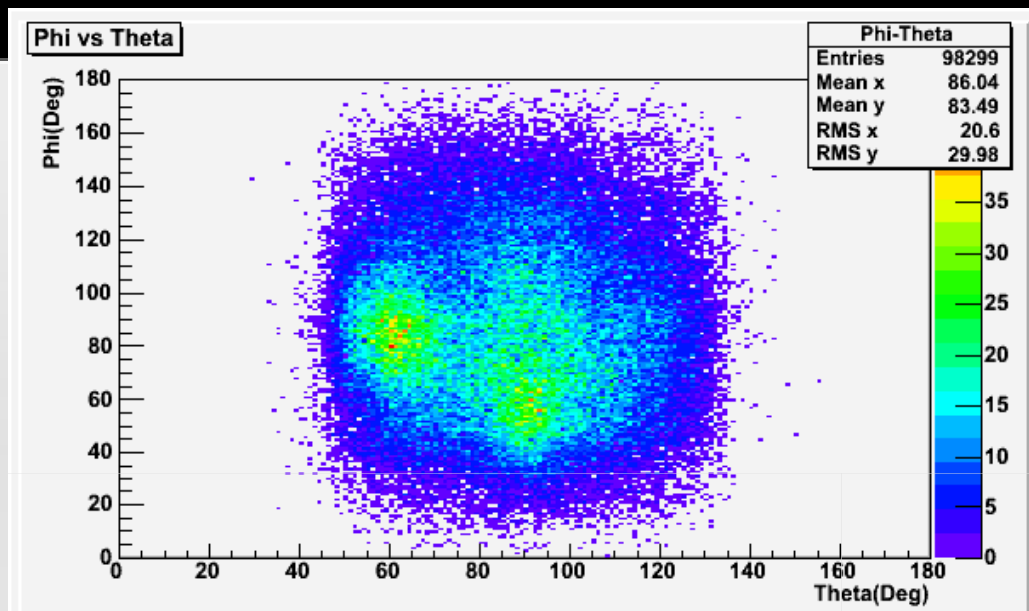
# Trigger OB3 & OCP: Muon Multiplicity in TPC

Run 85024

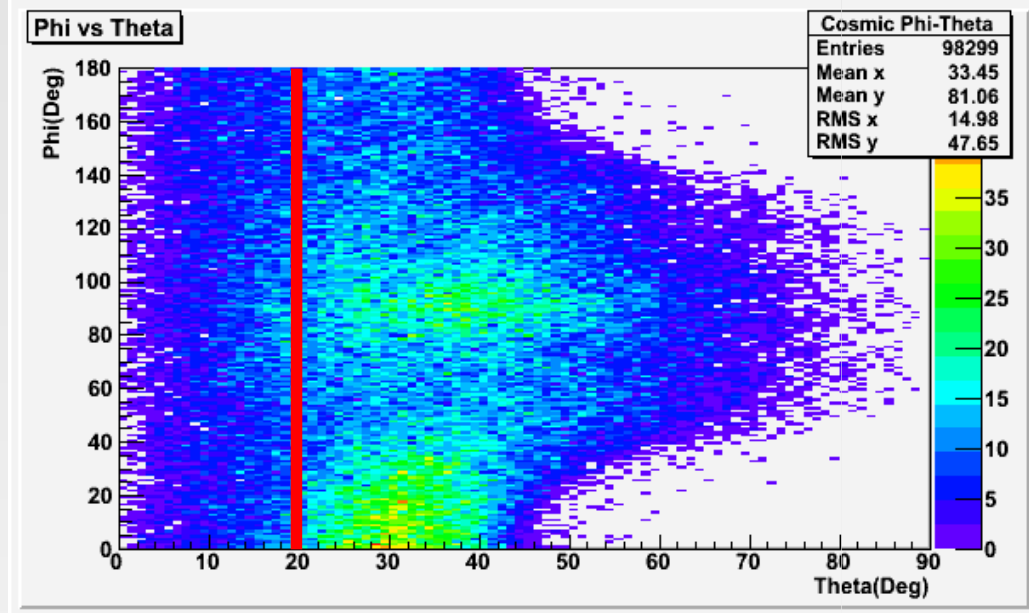


# Study of Matched Muons: Angular Distribution

Run 85024



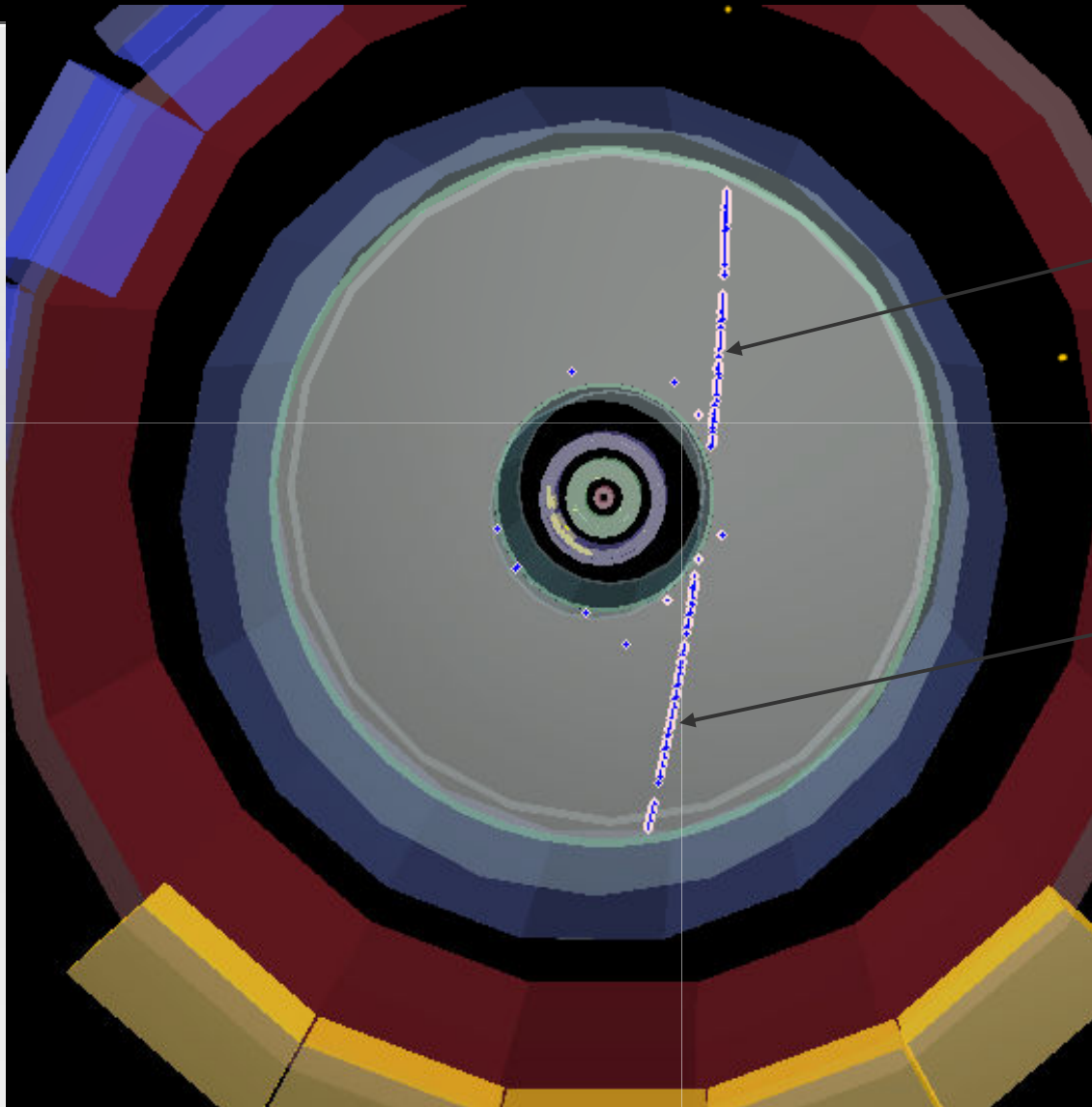
ALICE System



Cosmic System

# Single Muon in TPC

Run 83802



$P_{\text{up}} = 3.9 \text{ GeV}/c$

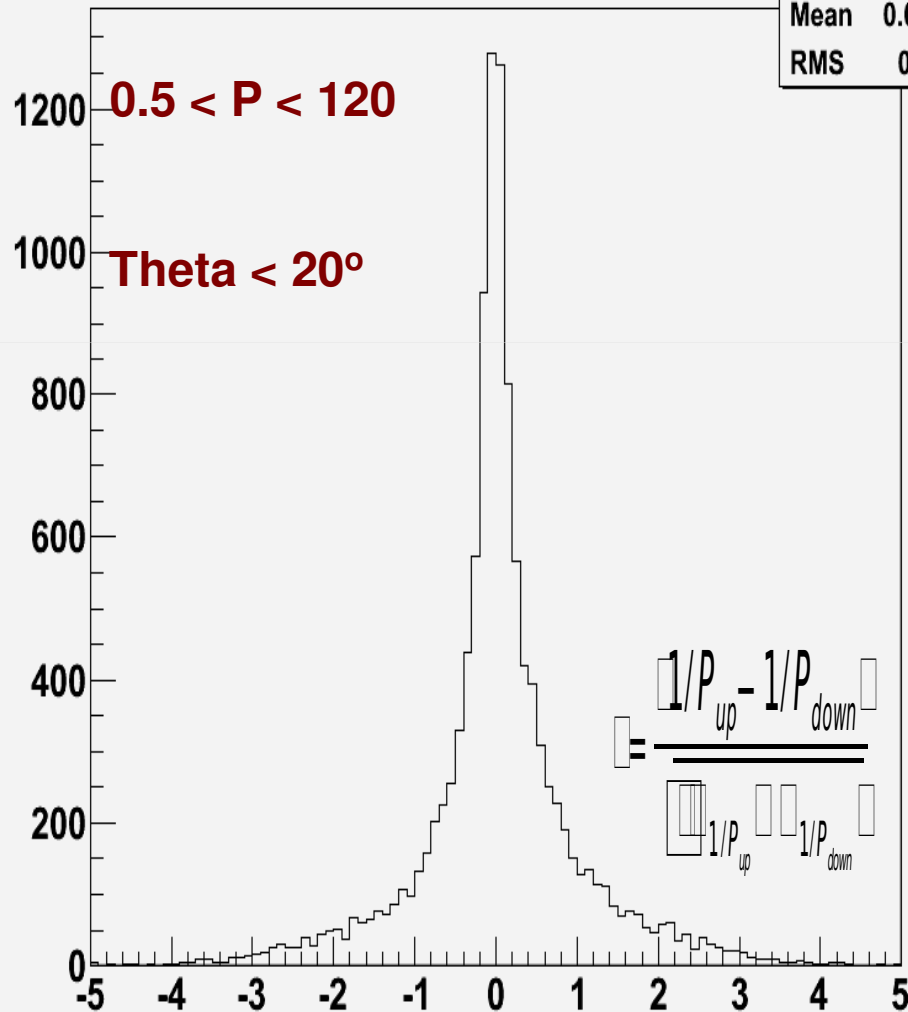
$P_{\text{down}} = 3.5 \text{ GeV}/c$

# Study of the Momentum of Matched Tracks for Single Muon

Run 83802

Uppertracks and downtracks

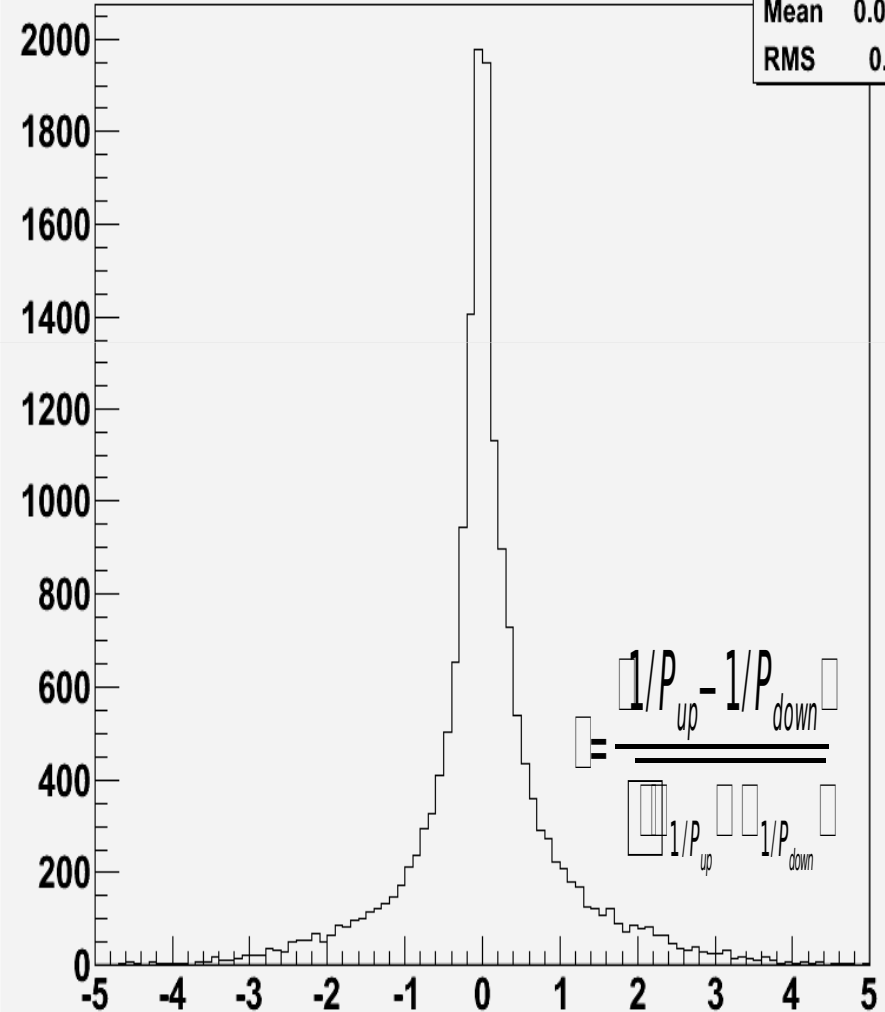
thetaCosmic 0-20
Entries 11633
Mean 0.04344
RMS 0.9959



Run 83775

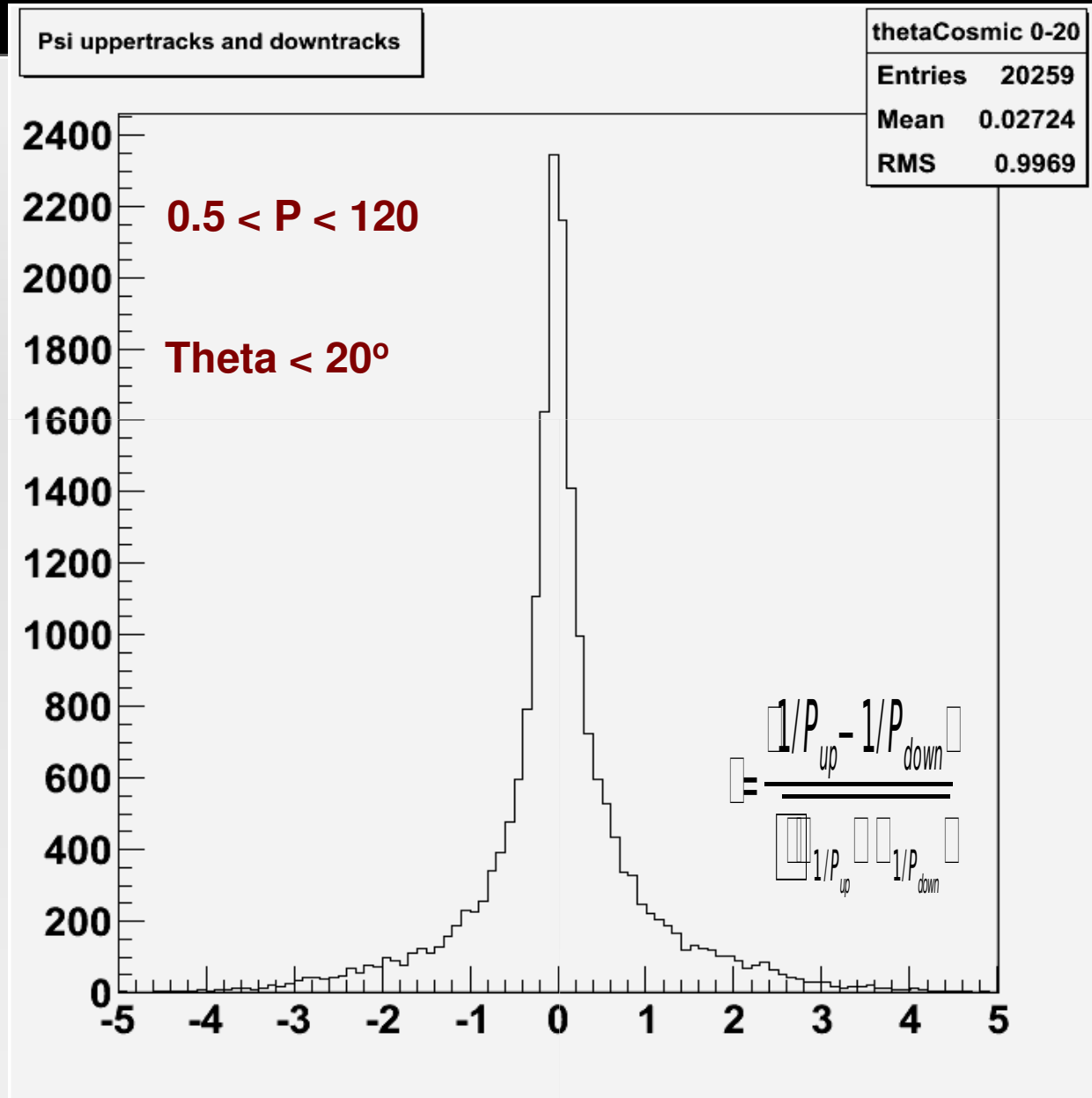
Uppertracks and downtracks

thetaCosmic 0-20
Entries 17531
Mean 0.03727
RMS 0.9981



# Study of the Momentum of Matched Tracks for Single Muon

Run 85024



# Study of the Momentum of Matched Tracks for Single Muon

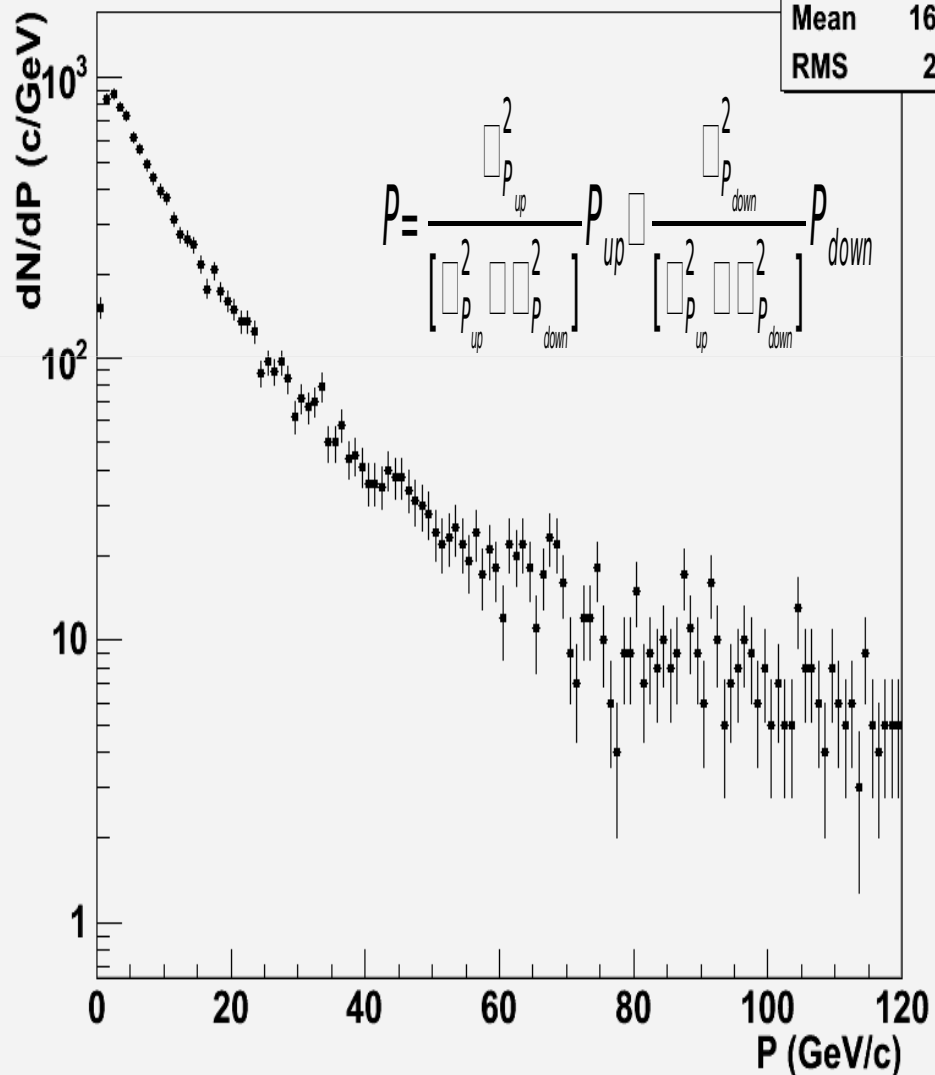
Run 83802

Run 83775

Momentum matched tracks

Momentum Mu 0-20

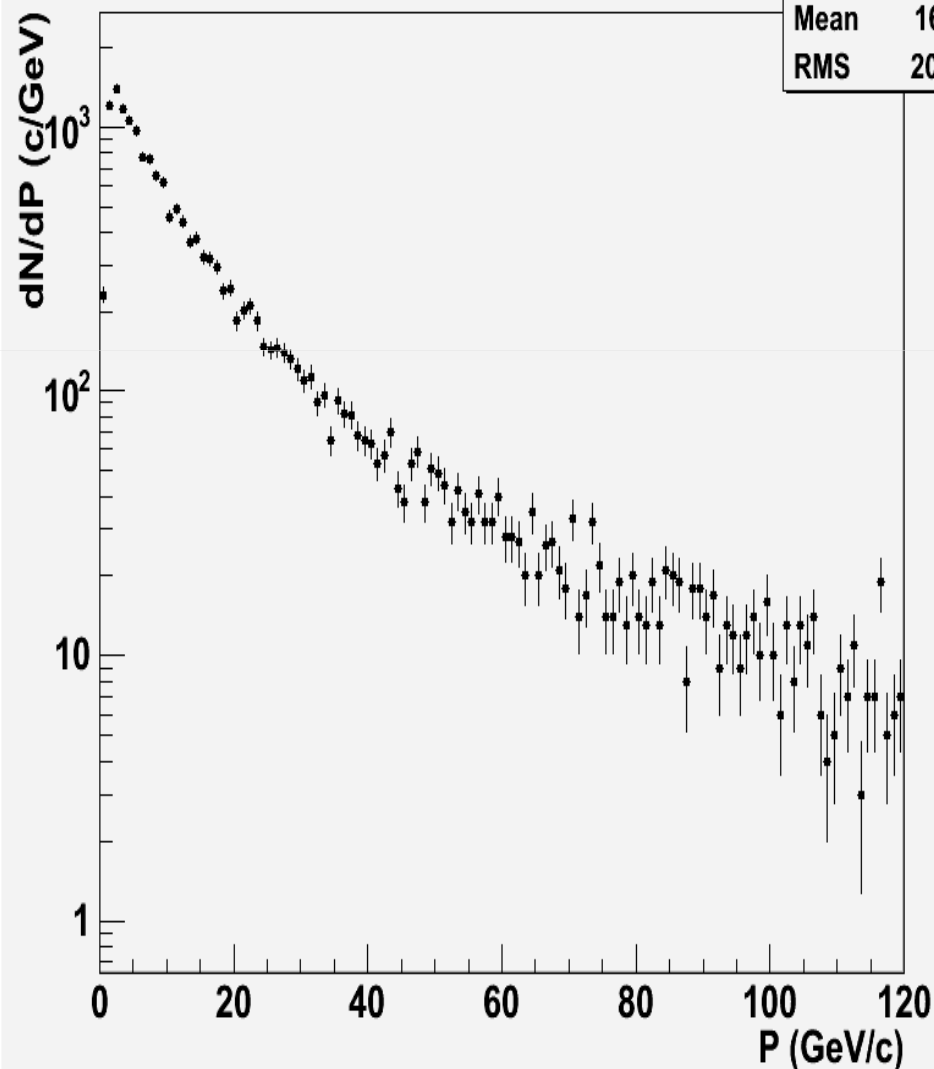
Entries	11633
Mean	16.64
RMS	20.3



Momentum matched tracks

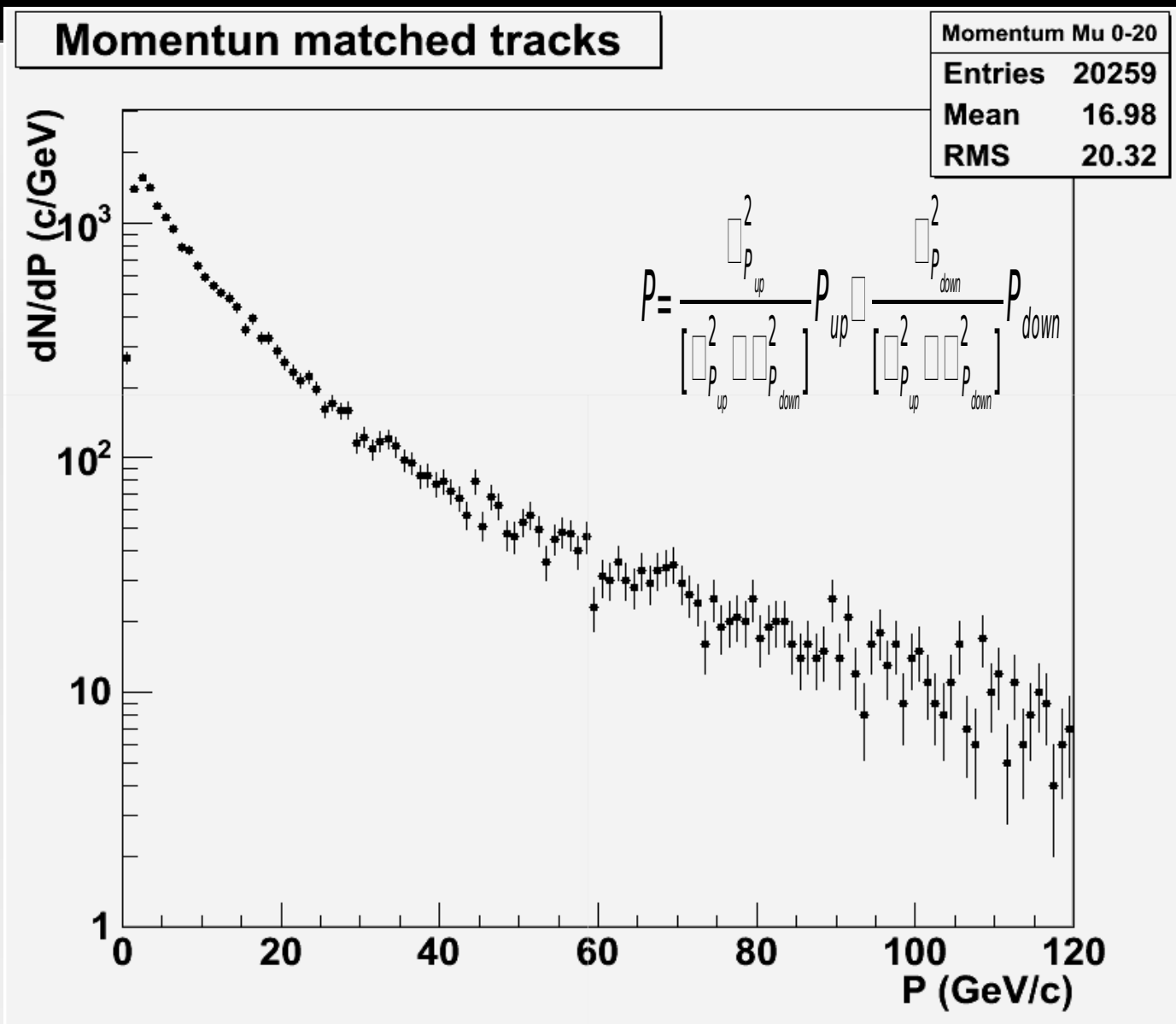
Momentum Mu 0-20

Entries	17531
Mean	16.91
RMS	20.46



# Study of the Momentum of Matched Tracks for Single Muon

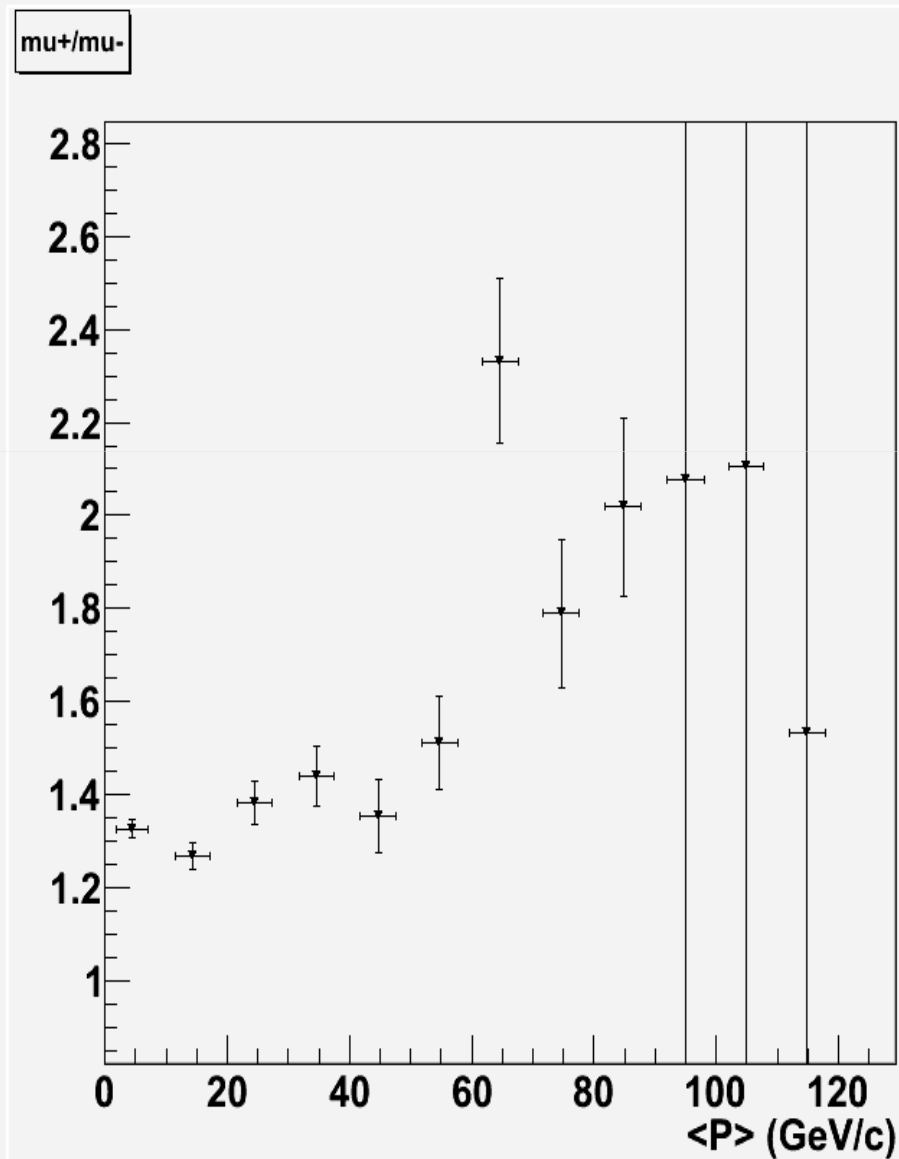
Run 85024



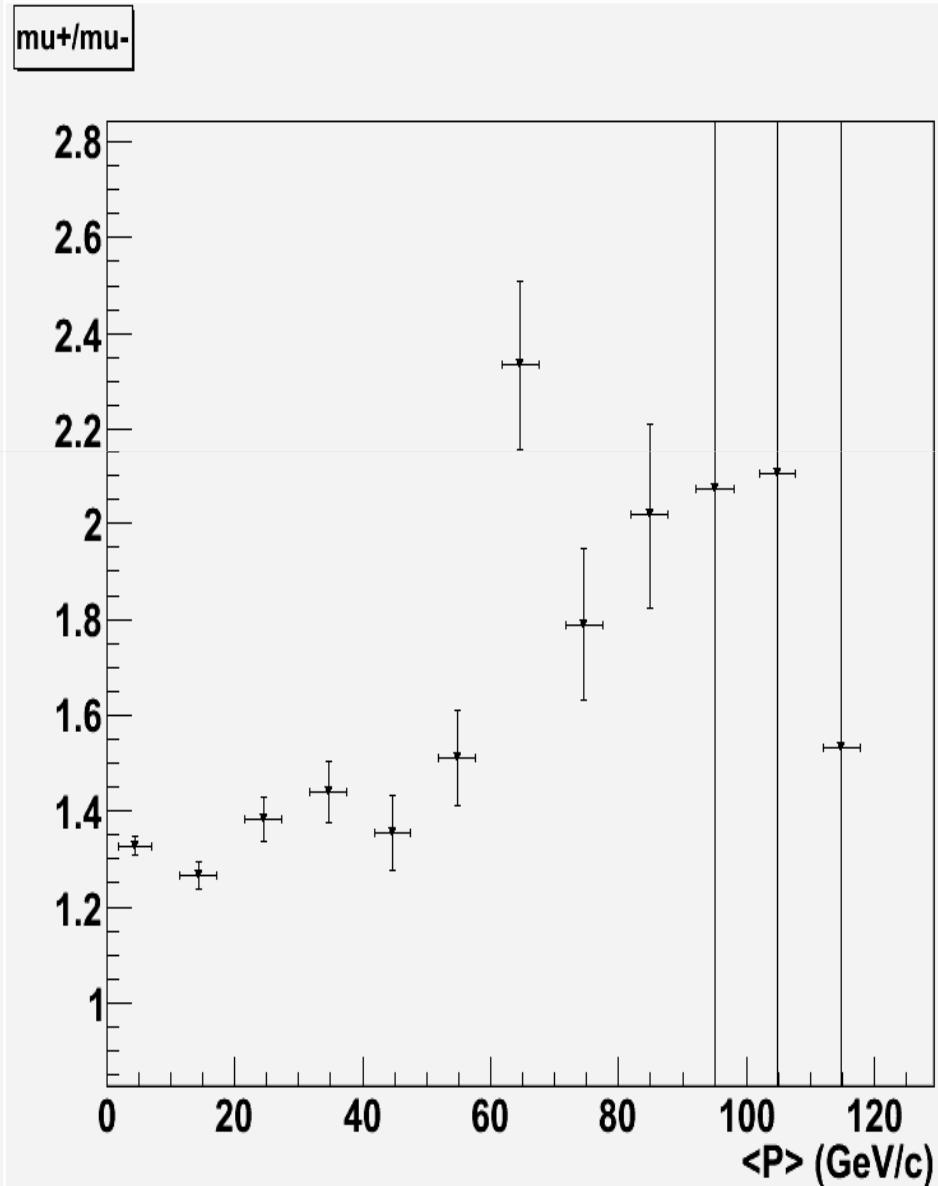


# Ratio $\mu^+/\mu^-$

Run 83802



Run 83775



# Conclusions

We are planning to analyze all the cosmic sample with  $B=0.5$  T

25-31 August 02-09 September

Actually only few runs analyzed

Analysys on two topics are possible :

Muon Interaction in iron

Atmospheric muons

We have presented studies on atmospheric muons :

Muons multiplicity distribution

Muon momentum spectrum

Ratio  $\mu^+/\mu^-$

to test the data taking and the performance of the varius algorithms