

L1 – HLT Trigger for BPhysics for the next year

L1Muon ghosts,
L1Quality,
Topologic,
issues

Selections not tuned! Only a qualitative sight

Rates: today

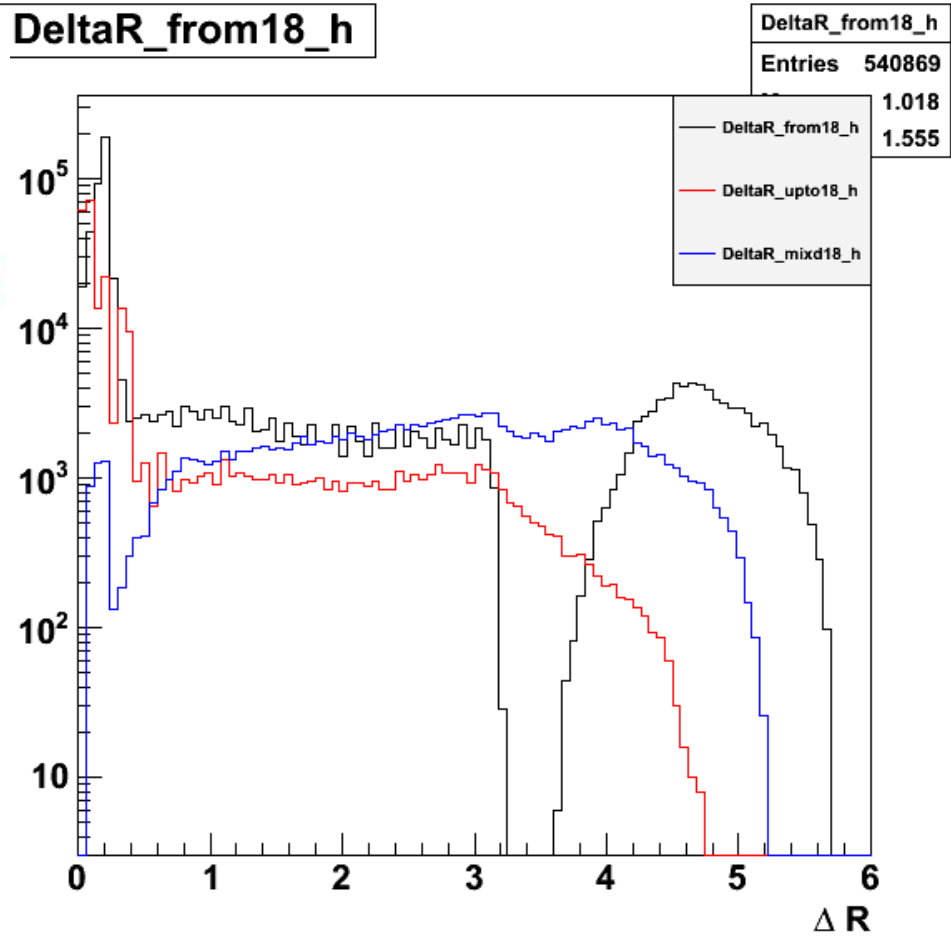
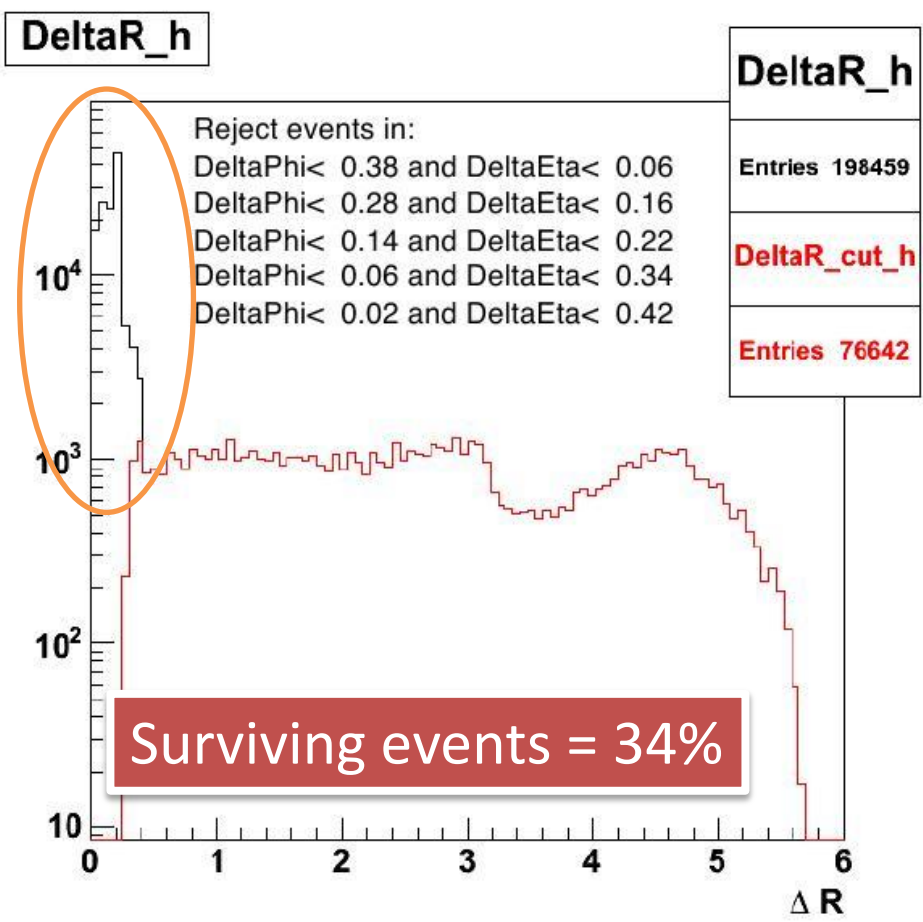
HLT_DoubleMu0_Quarkonium_v1 - 1.8E32 - 35 Hz



Next year we'll get 25 Hz,
for $L = 2E33$ up to $5E33$

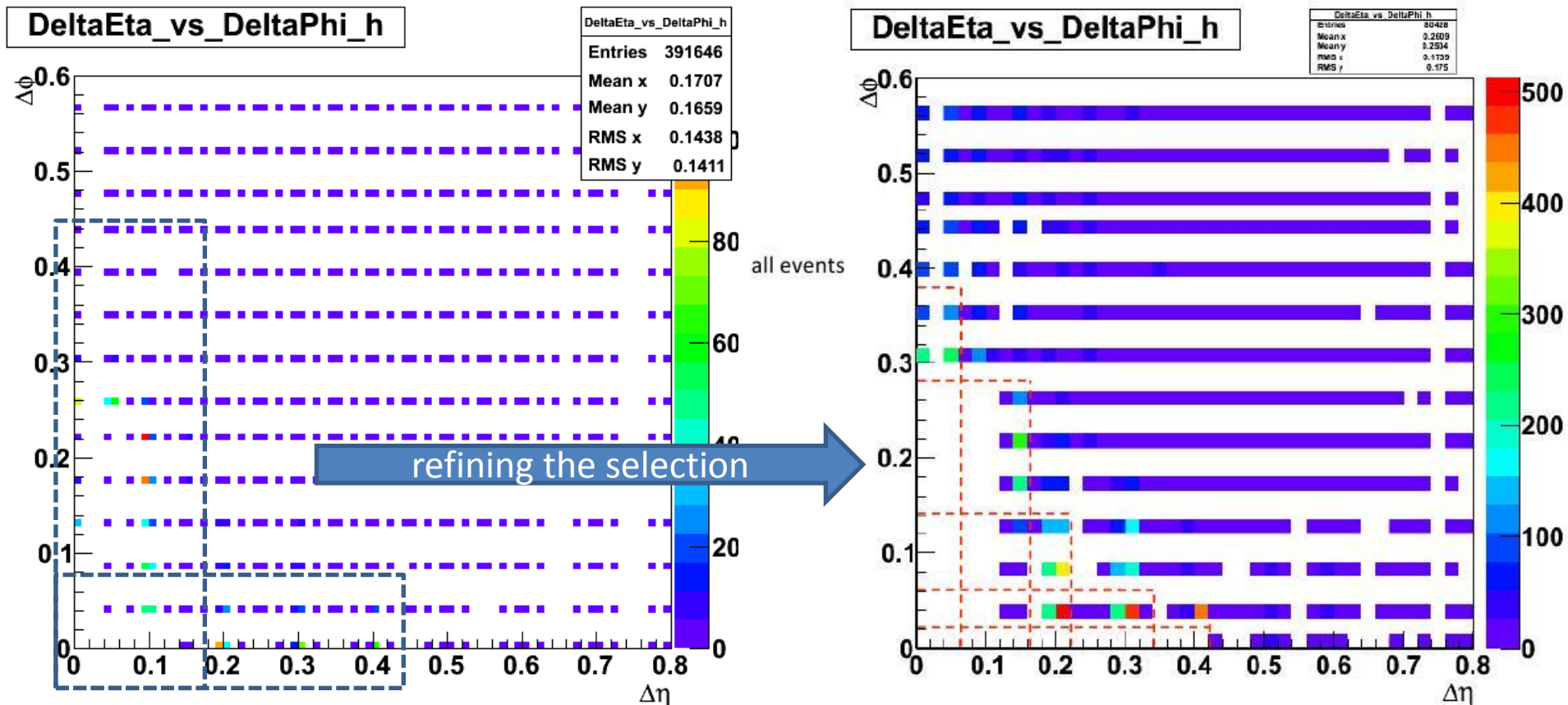
L1 Ghost Muons

$$\Delta R = \sqrt{\Delta \eta^2 + \Delta \phi^2}$$



Cuts in L1 DeltaEta DeltaPhi

- Let's look at L1 Muon variables Eta and Phi



Invariant Mass at L3

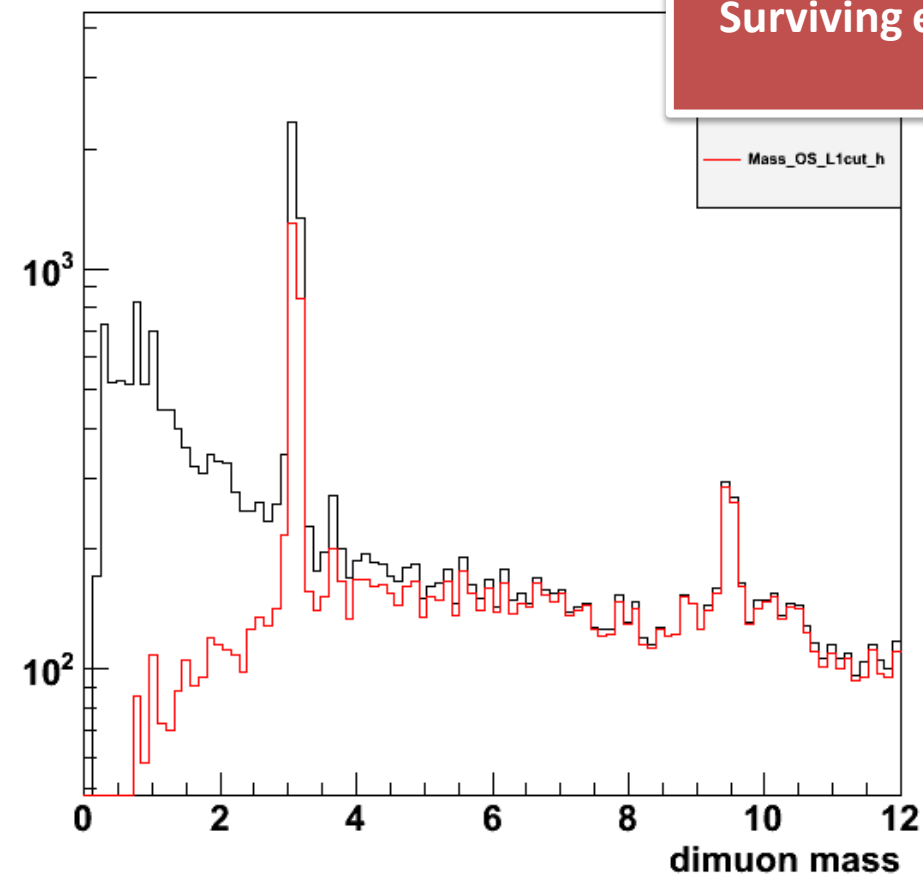
- Run 144112

```

if (L1MuEta[i]<-1.5 && L1MuEta[j]>1.5) continue;
if (L1MuEta[j]<-1.5 && L1MuEta[i]>1.5) continue;
if (fabs(L1MuEta[i])<1.8 && fabs(L1MuEta[j])<1.8) {
  if ( (DeltaPhi < 0.12 && DeltaEta < 0.02) ||
        (DeltaPhi < 0.02 && DeltaEta < 0.18) ) continue;
}
else if (DeltaPhi < 0.24 && DeltaEta < 0.07)
continue;

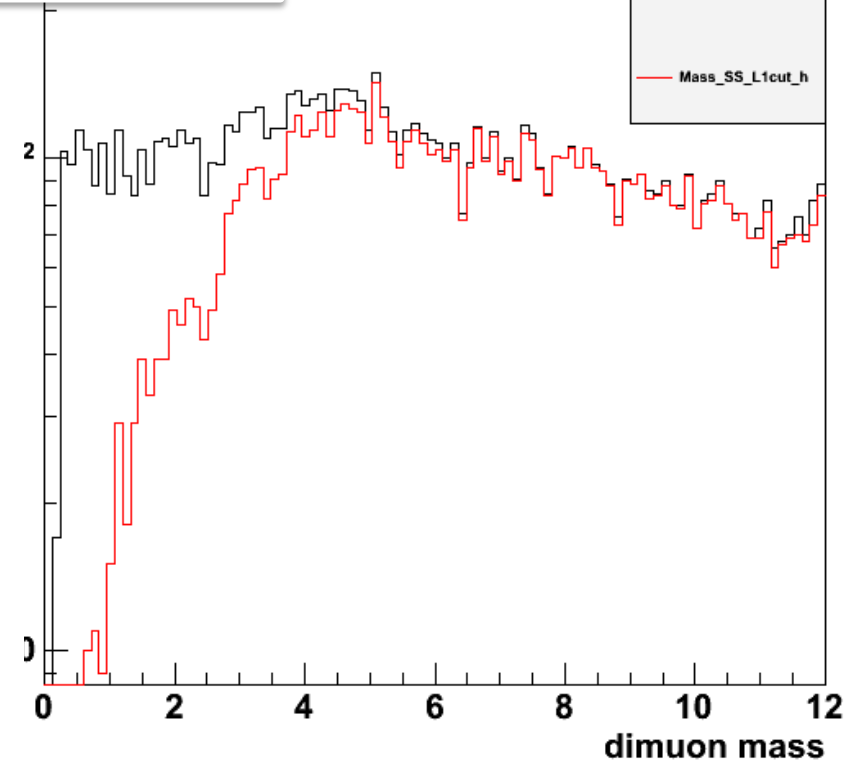
```

Mass_OS_h



Surviving events = 63.7%

Mass_SS_h	
Entries	16548
Mean	5.747
RMS	3.232



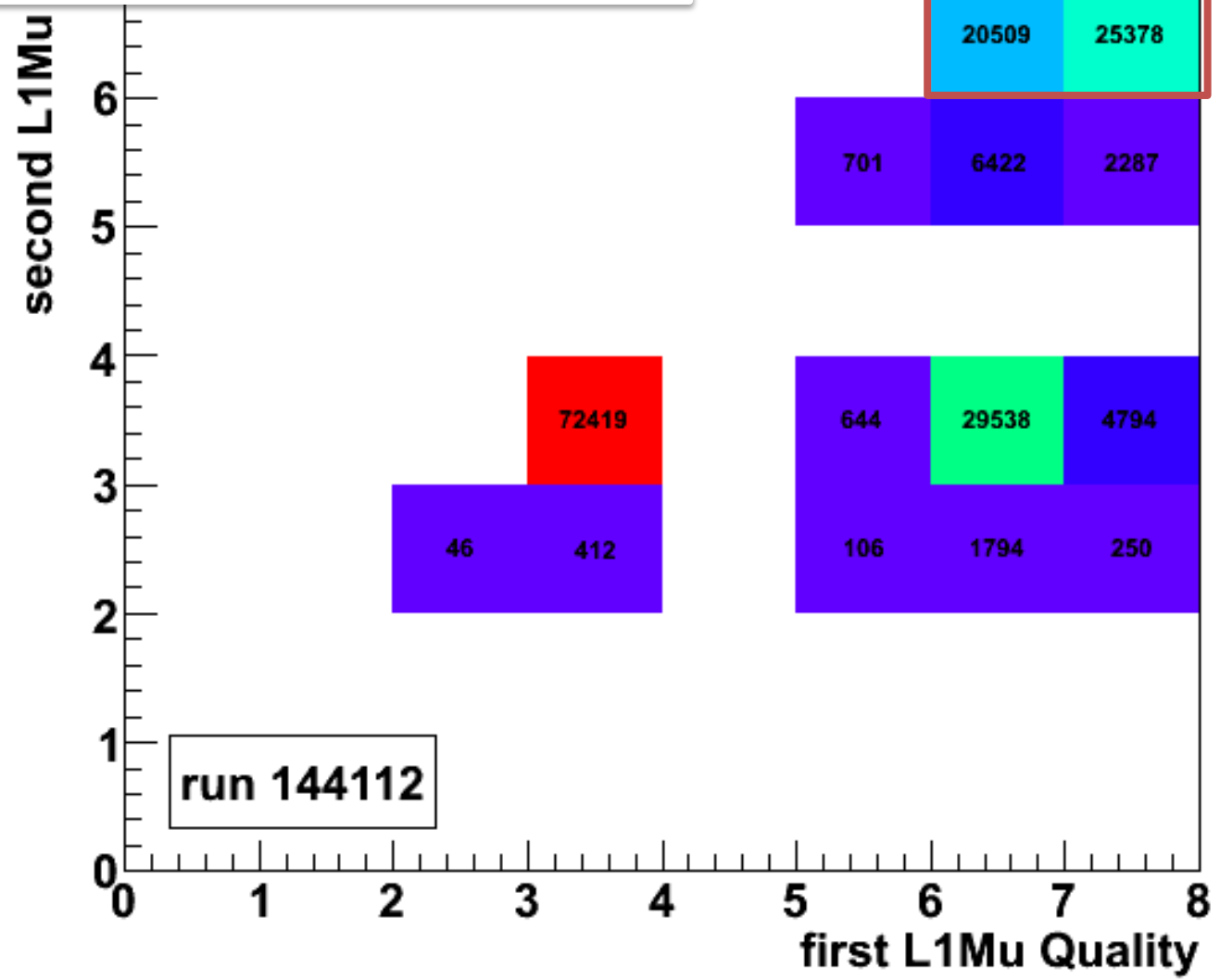
HLT_L1DoubleMuOpen_Tight

L1Muon Quality

RMS x
RMS y

Quality 7 = (DT + RPC) OR (CSC + RPC)
Quality 6 = DT OR CSC only

28.9%

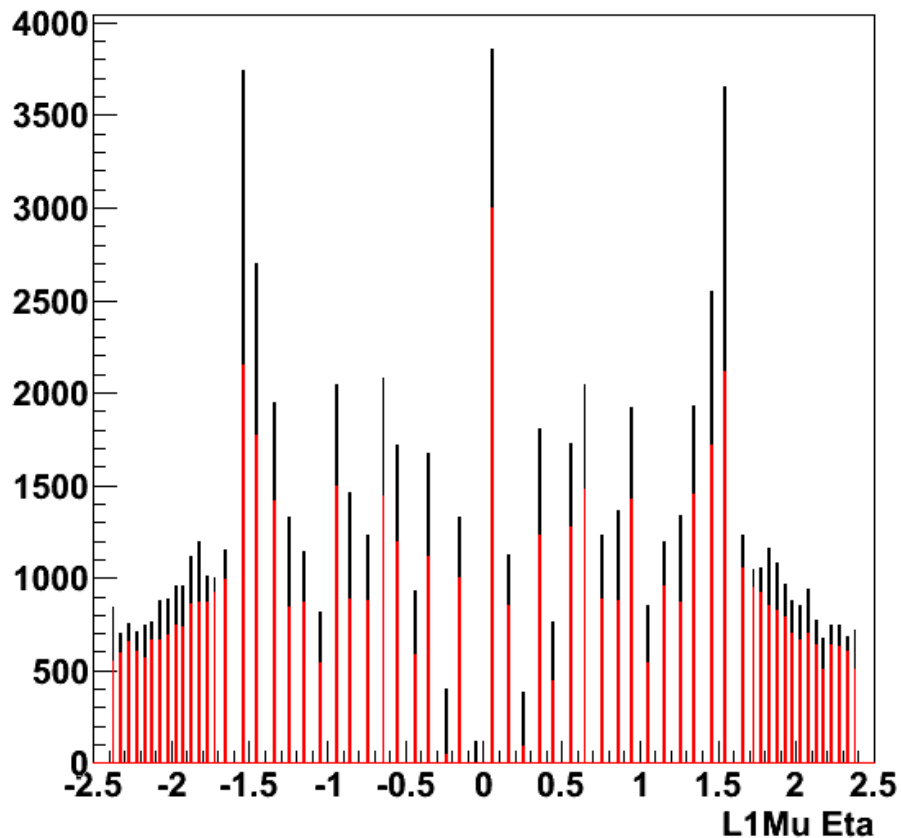


run 144112

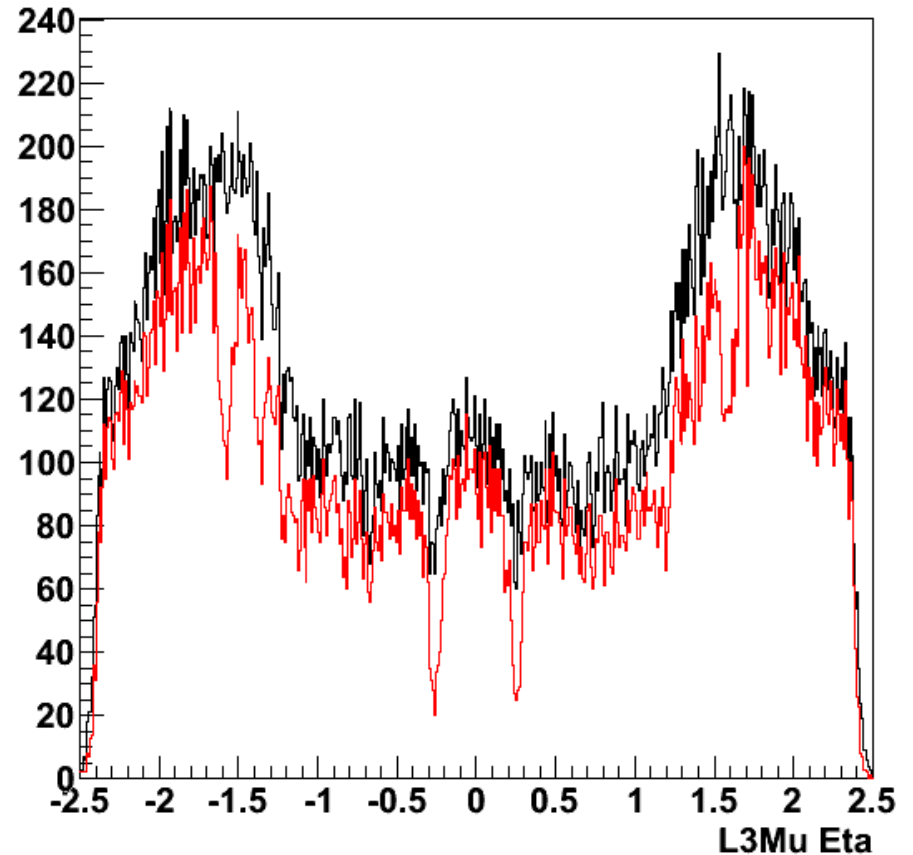
L1Quality

Quality = 7 OR (Quality = 6 AND $|\text{Eta}| > 1.6$) = 9.2% at L1

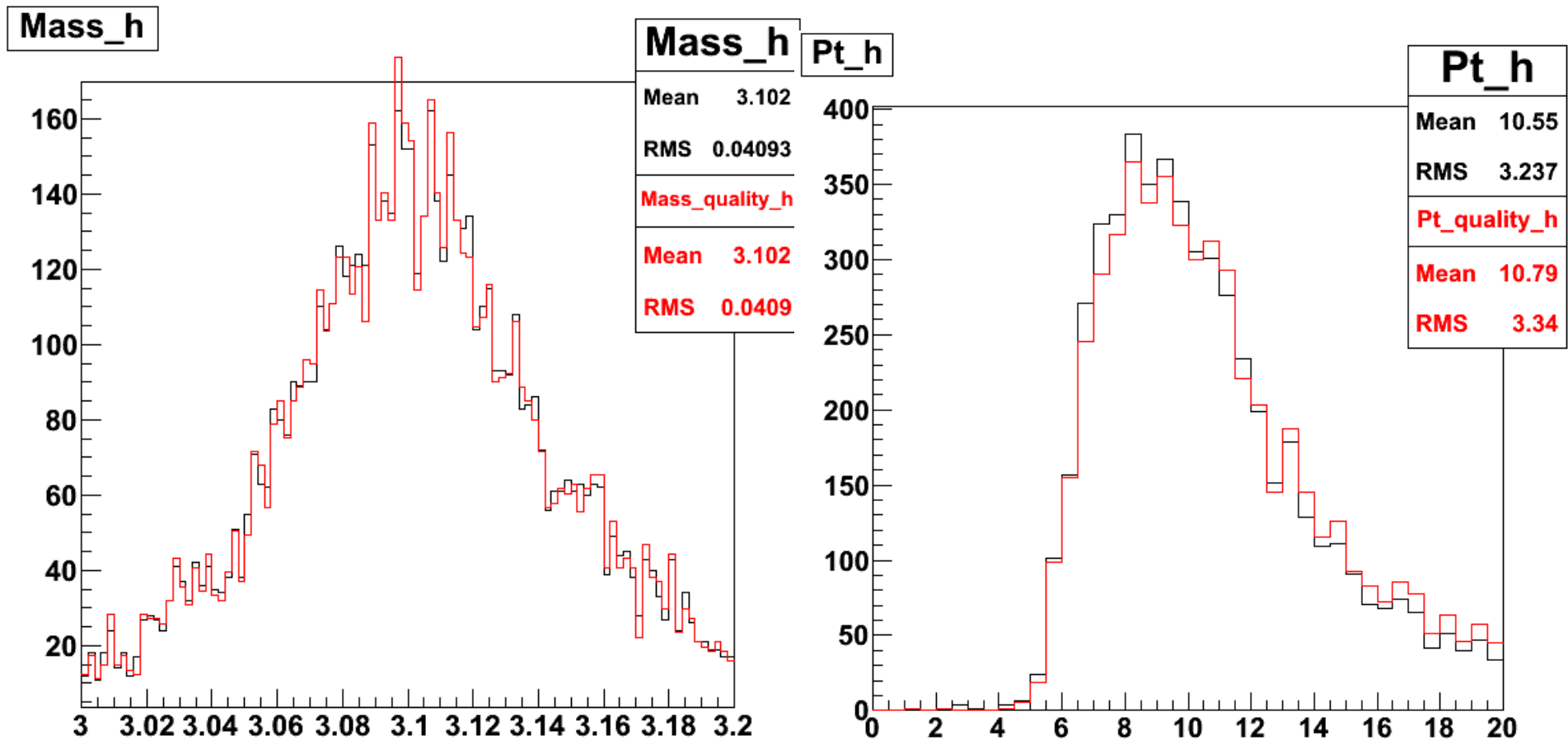
EtaL1_h



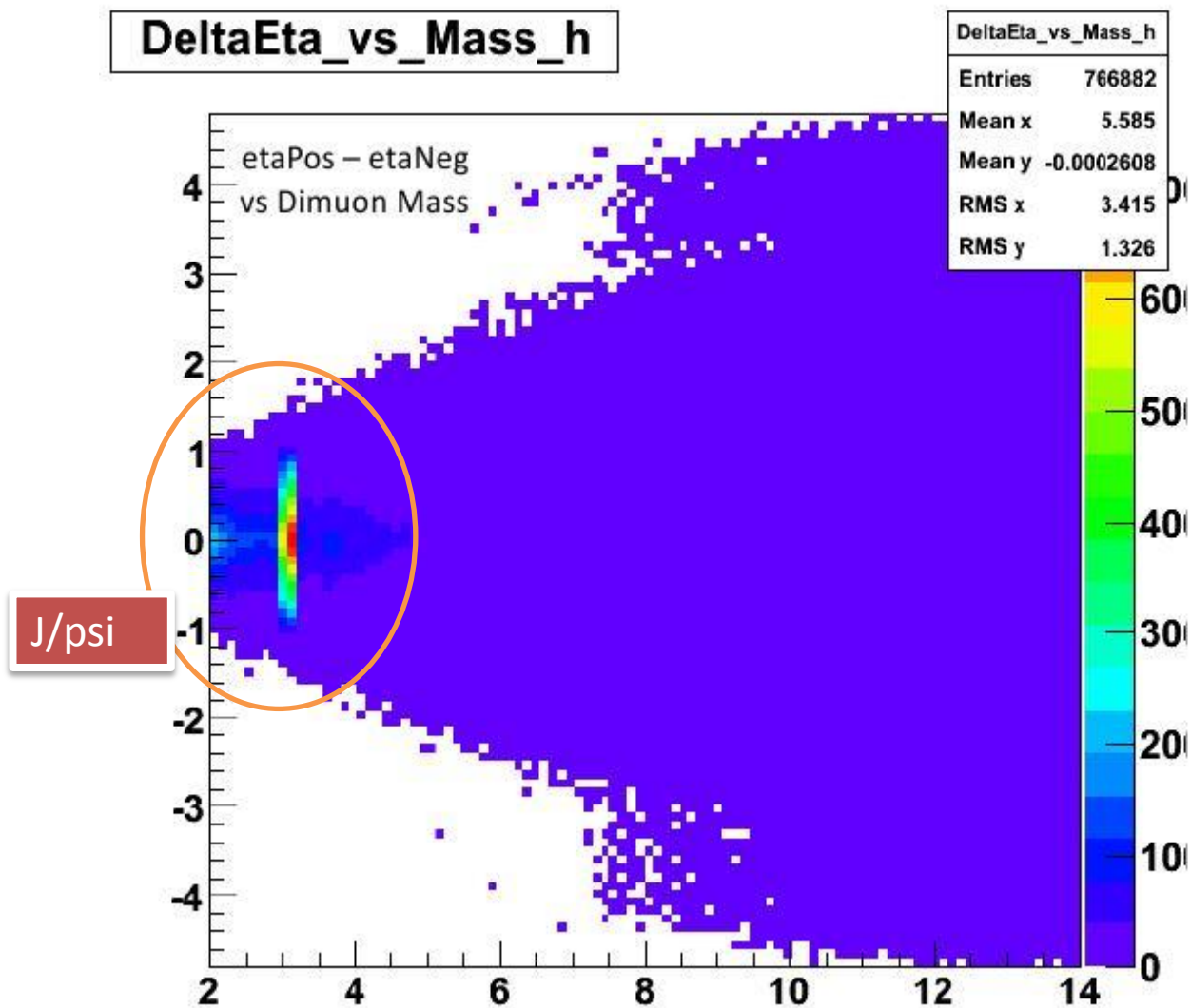
EtaL3_h



- Pt bias 2-2.5%
- L3 Selection = 61.9%

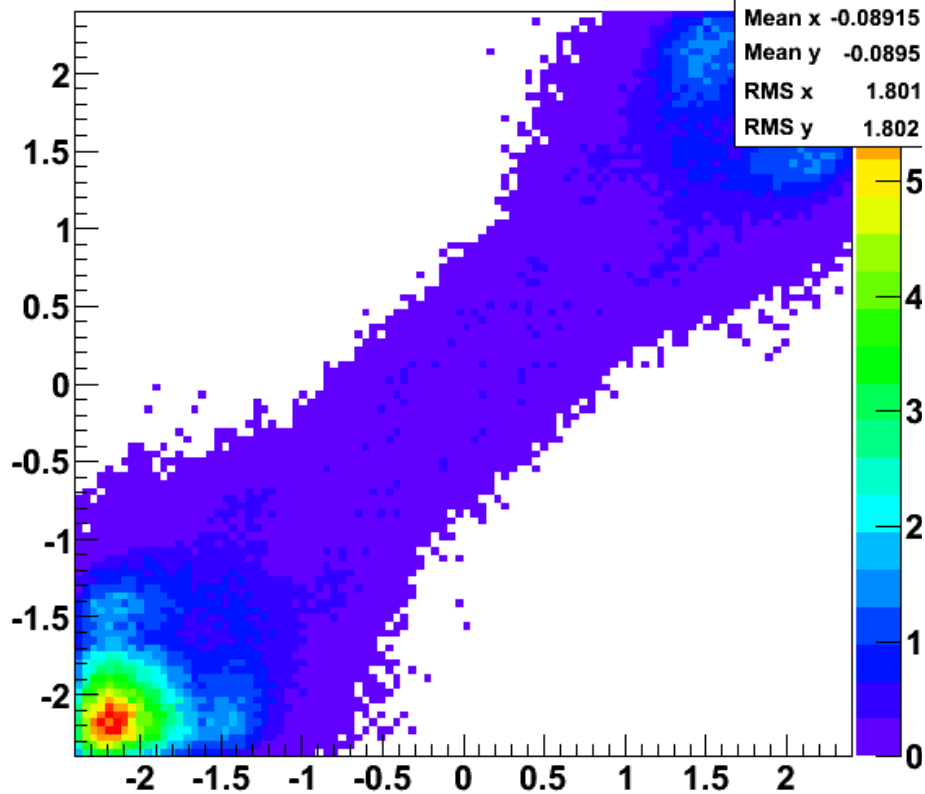


Topological cuts at L3 Muons

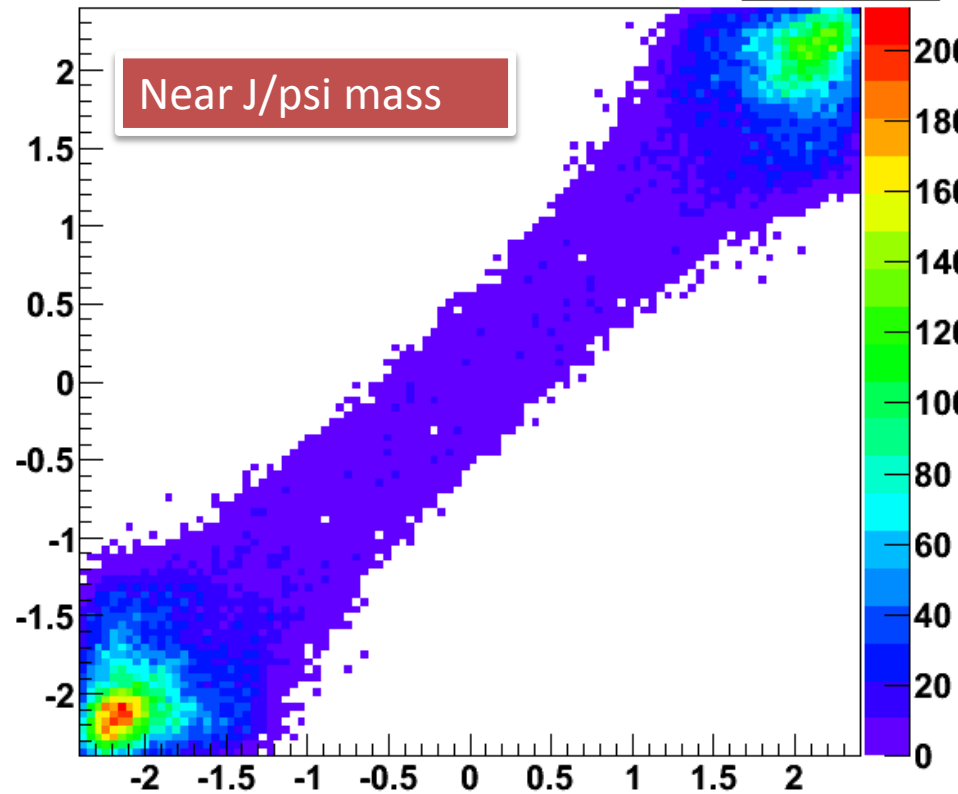


L3 Muons

EtaPos_vs_EtaNeg_h



EtaPos_vs_EtaNeg_h



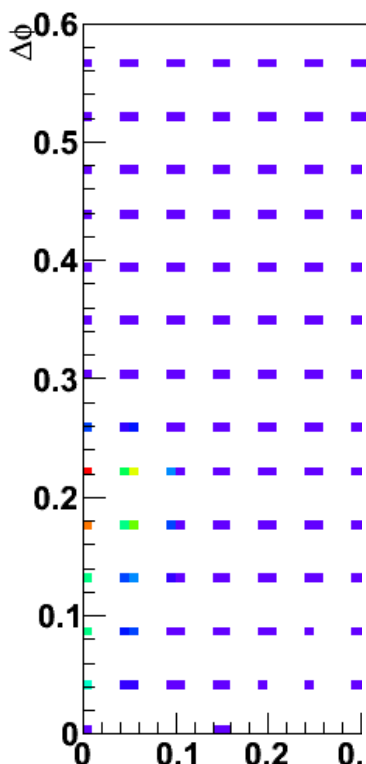
Conclusions

- At L1 we have to reduce the rate to 10%
- At HLT we have to reduce the rate up to 2.5% (5E33)
- → Work is in progress

BACKUP

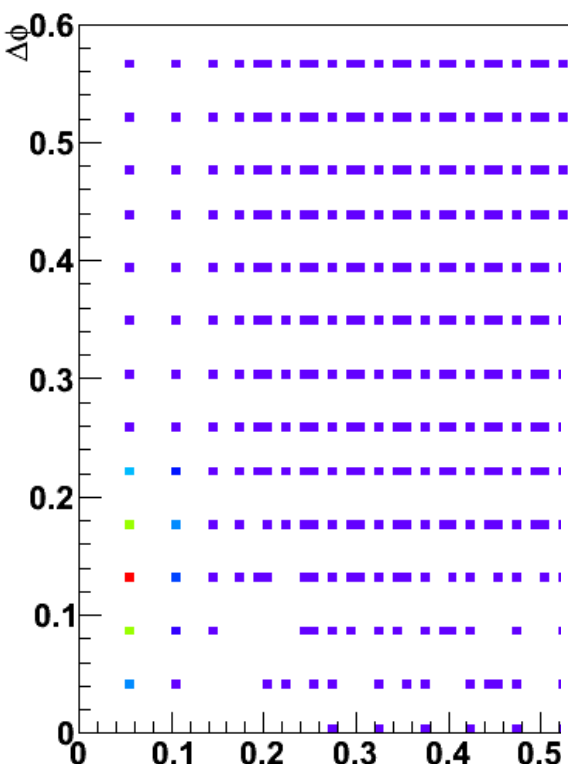
DeltaEta_vs_DeltaPhi_from18_h

Entries	540869
Mean x	0.03829
Mean y	0.1796
RMS x	0.04991
RMS y	0.07528



DeltaEta_vs_DeltaPhi_mixd18_h

Entries	135583
Mean x	0.3321
Mean y	0.2671
RMS x	0.2629
RMS y	0.1576



DeltaEta_vs_DeltaPhi_upto18_h

Entries	247572
Mean x	0.1004
Mean y	0.0416
RMS x	0.1265
RMS y	0.07107

