Tau Dilepton Analysis: μ, τ Acceptance

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- Muon ID N-1 plots
- Event Selection N-1 plots
- Acceptance

Muon ID

- Use baseline tight central muon ID cuts
- Allow only CMUP and CMX Muons

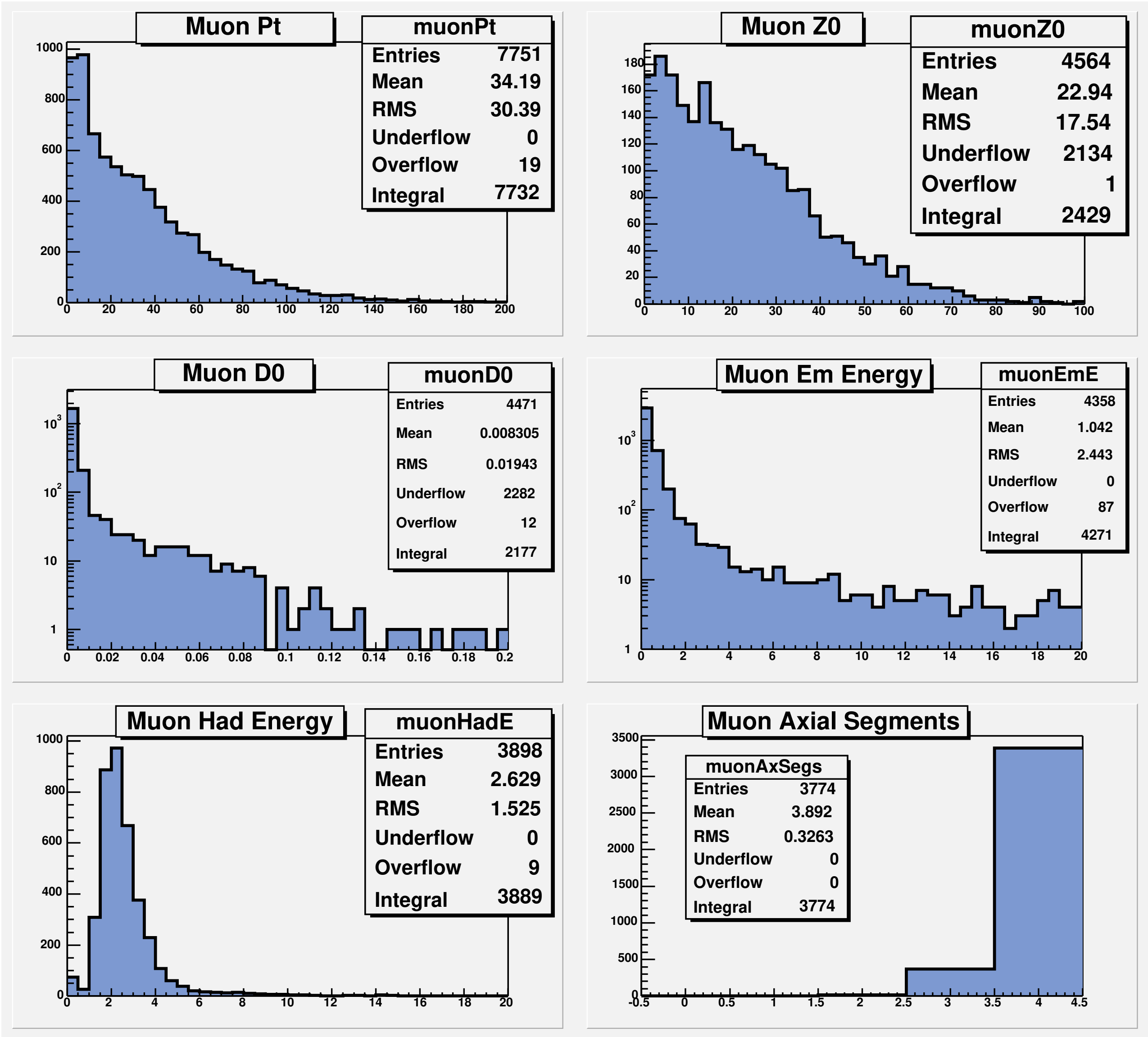
Variable	Cut Value
Track P_T (Beam Constr.)	$>$ 20GeV
$\mid$ track z0 $\mid$	$<$ 60cm
Cosmic Ray Removal	(cosmic tagger)
Cal Em Energy	$<$ 2.0 + m(0, 0.0115*(p-100))
Cal Had Energy	$<$ 6.0 + m(0, 0.028*(p-100))
Cal Iso Ratio	$<$ 0.1
$\mid$ CMU Δx $\mid$	$<$ 3.0 cm
$\mid$ CMP Δx $\mid$	$<$ 5.0 cm
$\mid$ CMX Δx $\mid$	$<$ 6.0 cm
$\mid$ track d0 $\mid$	$<$ 0.02cm (with SI Hits) $<$ 0.2cm (no SI Hits)
COT Track Quality	3 Axial SL w/ $\geq$ 7 hits 3 Stereo SL w/ $\geq$ 7 hits

Muon ID

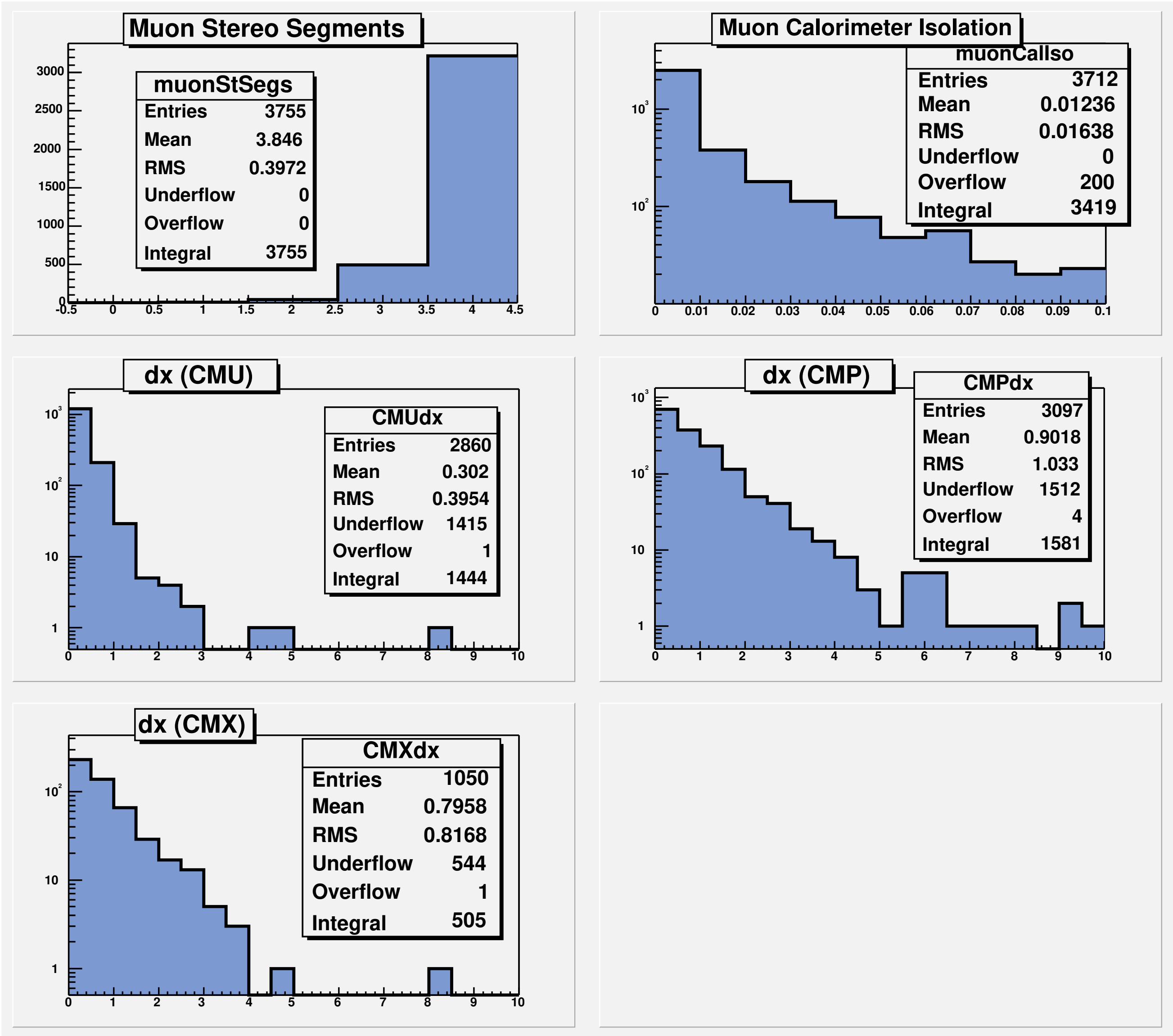
- Efficiency of Cuts in MC
- Using 398,037 Pythia inclusive ttbar events

Variable	# muons	N-1 Efficiency
CMUP or CMU Stub	7751	100
P_T	4564	59 %
$\mid$ track z0 $\mid$	4471	98 %
$\mid$ track d0 $\mid$	4358	97 %
Cal Em Energy	3898	89%
Cal Had Energy	3774	97%
Axial Segments	3755	99%
Stereo Segments	3712	99%
Cal Iso Ratio	3419	92%

N-1 plots


Muon Pt
muonPt
Entries 7751
Mean 34.19
RMS 30.39
Underflow 0
Overflow 19
Integral 7732
Muon Z0
muonZ0
Entries 4564
Mean 22.94
RMS 17.54
Underflow 2134
Overflow 1
Integral 2429
Muon D0
muonD0
Entries 4471
Mean 0.008305
RMS 0.01943
Underflow 2282
Overflow 12
Integral 2177
Muon Em Energy
muonEmE
Entries 4358
Mean 1.042
RMS 2.443
Underflow 0
Overflow 87
Integral 4271
Muon Had Energy
muonHadE
Entries 3898
Mean 2.629
RMS 1.525
Underflow 0
Overflow 9
Integral 3889
Muon Axial Segments
muonAxSegs
Entries 3774
Mean 3.892
RMS 0.3263
Underflow 0
Overflow 0
Integral 3774

N-1 plots (cont'd)



- Note that the Dx cuts are not N-1 plots in the same style as the rest of the plots.

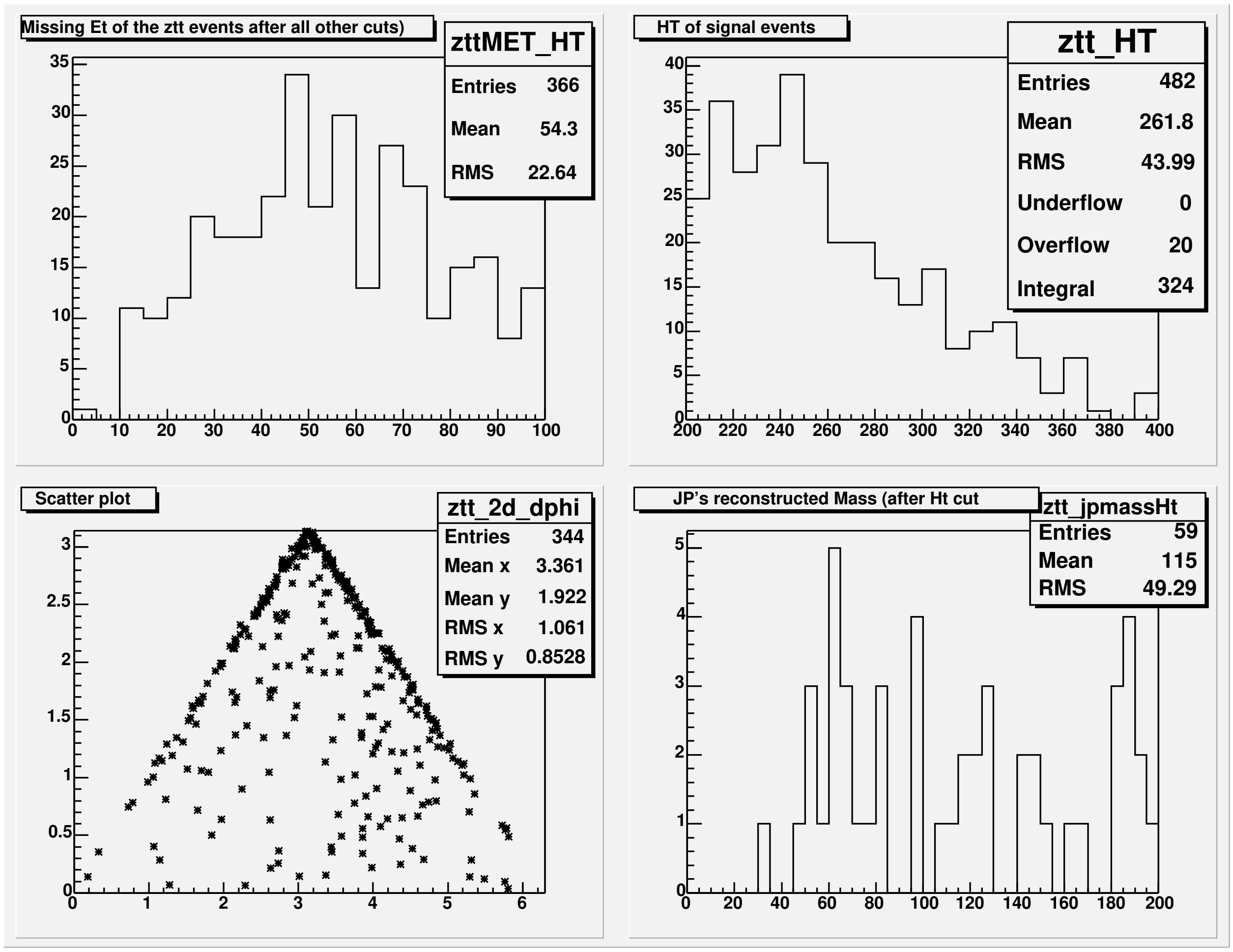
Event Selection

Cut	# of $\mu\tau$ Events	# of $\tau\tau$ Events
	9212	4683
Good Muon and Tau	661	655
Opposite Sign	450	345
1j > 30GeV	397	295
2j > 10GeV	321	226
$\not\!\!E_{\mathrm{T}} > 20$GeV	284	198
$H_T > 200$GeV	232	112

Table 1: ttbar acceptance from Pythia Monte Carlo dataset ttopei. There is no matching between HEPG objects and reconstructed objects. This inclusive dataset has 398,037 events.

- Haven't yet found problem with too-high tau, tau acceptance

Acceptance



- There are 344 events remaining before the Z mass veto
- 14 events are lost due to the Mass cut
- 330/398037 * 93% (trigger efficiency) leads to an acceptance of 0.00077 $\pm$ 0.00005
- e,tau acceptance is 0.00054 $\pm$ 0.00004