

A short Report on CMS Trigger Week
A. FAHIM

Muon Trigger Review (Adam Everett - Purdue University)

<http://indico.cern.ch/getFile.py/access?contribId=3&sessionId=8&resId=1&materialId=slides&confId=83795>

Performance of the HLT!

Efficiencies: MC

Ratios:

- Reco Muon Matched to L1/ Reco Muon
- Reco Muon Matched to L2/ Reco Muon Matched to L1
- Reco Muon Matched to L3/ Reco Muon Matched to L1

Vs pt and eta

95% plateau efficiency!

MC: SingleMu pt 0-500 GeV; ZMM; START3X_V18

J. Slaunwhite, J. Klukas, T. Danielson, A. Everett

Normalize the 900 and 2300 GeV MC to the luminosity

	Expected L2 in MC	Observed L2	Expected L3 in MC	Observed L3
900 GeV	75.2	76	73.5	69

2009 Collision Studies

Small amount of collision muons!

- Run analyzers and DQM modules!
- Statistics too low and spectrum too soft for studies as a function of pT and ! η !

H. Yoo;

L3 Muon Trigger Performance
 The main source of failures is low pT L2 with poorly reconstructed position
 H. Yoo; T. Danielson

	OIHit	OIState	IOHit	Cascade
GLB+L2	53			
GLB+L2+quality check	29			
L3	27	27	22	30*

* Cascade reconstructs 21 of 29 high quality muons; 9 of 24 lower quality muons

CRAFT Studies

Results of running Muon HLT on CRAFT data!

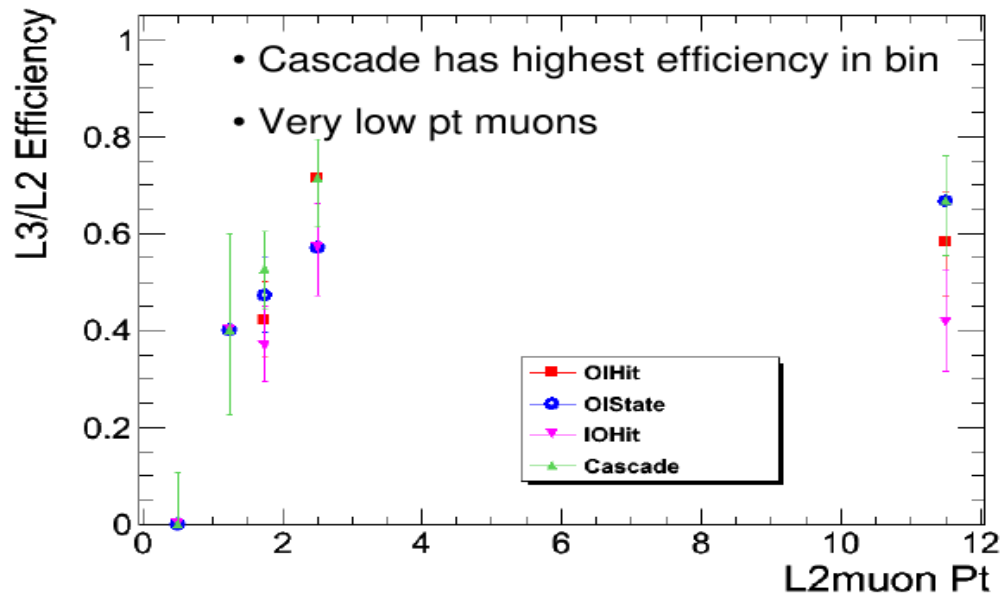
- Efficiency of different L2 steps is quite good! ($> 95\%$)
- Efficiency of L3 reconstruction using different configurations! (IOHits ~ 0.85 , ... > 0.95)

Performance of the Base Algorithms

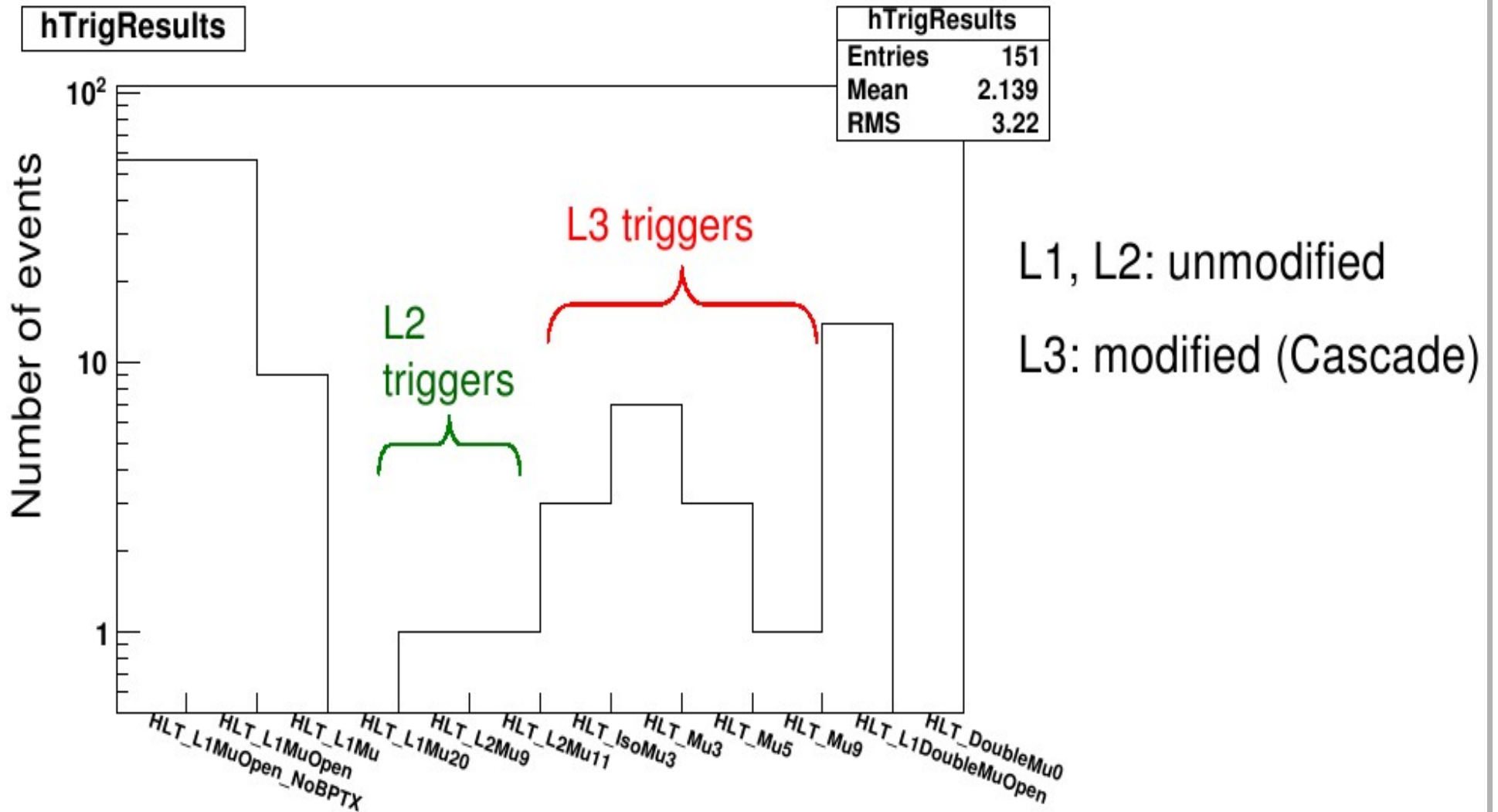
	OIHit	OIState	IOHit
GLB+L2	55		
L3 seeding	37	43	24
L3 Trajectory Building	28	29	23
L3 global matching	27	27	22
Total L3	27	27	22

Performance of the Cascade

	OIHit	OIState	IOHit	Cascade
GLB+L2	55			
L3	27	27	22	30



Muon HLT Rate by Trigger Path



Back Up

L3 Base Algorithms

Outside-In State-Based

Rescale L2 errors

Propagate L2 to tracker
outer layer

Use state on module to
make a seed

Pass seed to tracker
pattern recognition

Outside-In Hit-Based

Rescale L2 errors

Propagate L2 to tracker
outer layers

State + one hit to make
a seed

Pass seed to tracker
pattern recognition

Inside-Out Hit-Based

Make a tracking region
around L2 state

Find pixel -pairs -
triplets in tracking region

Use found hits to make
a seed

Pass seeds to tracker
pattern recognition

Cascade Algorithm: Intelligent combination of the three base algorithms
