



pt LUT assignment for CSCTF

By Anna Kropivnitskaya

- check PtLUTs at Point 5 with 7 TeV collision data
- Conclusion and Plans

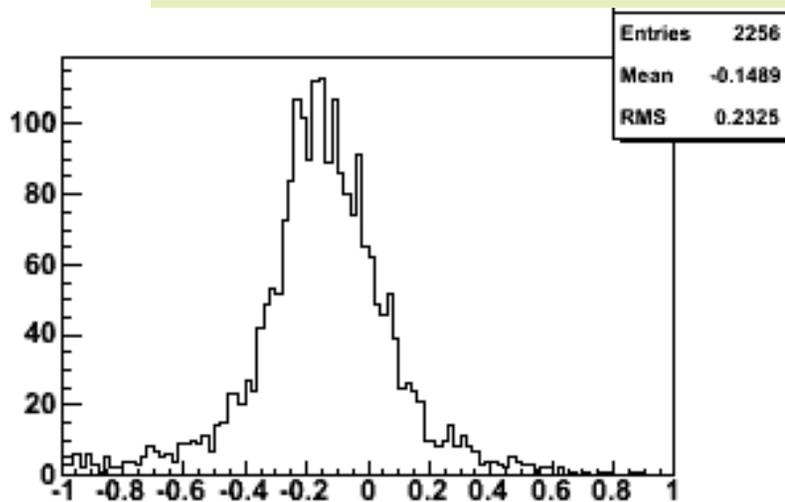
Collision data

Analyze ntuples which produce Gian Piero:

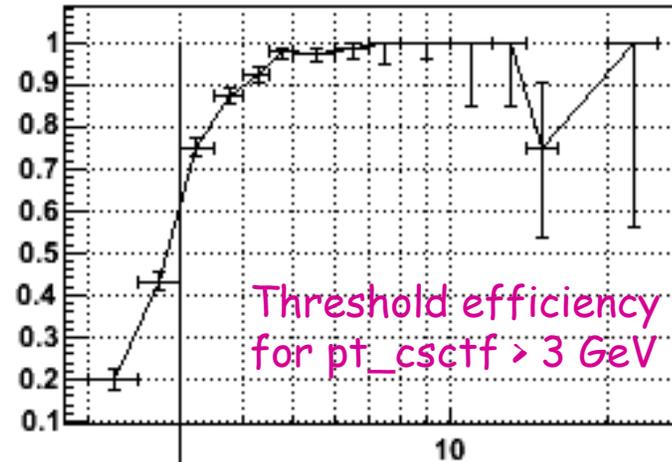
- ✓ Runs: 132440 - 133035
- ✓ Analyze only global muons which have matching with csctf tracks, so-called **N_glob** (it was selected 5596 such golden muons)

Threshold efficiency = $\{\text{N_glob with csctf_Pt} > \text{Pt threshold}\} / \text{N_glob}$

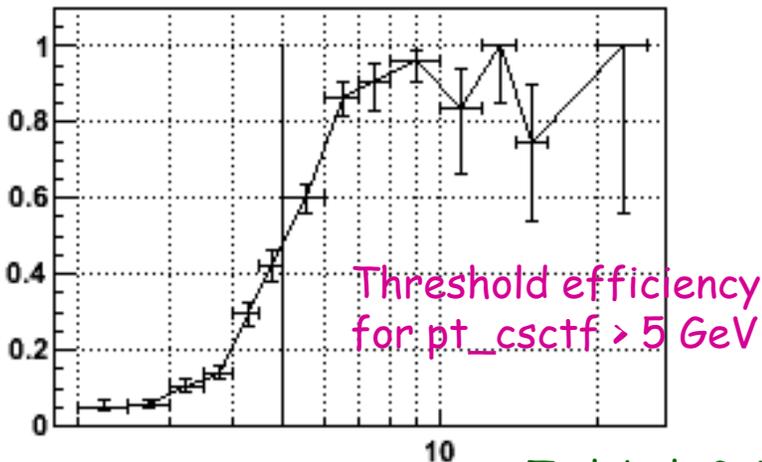
PtLUTs at Point 5: Q2&Q3, $1.2 < |\eta| < 2.1$



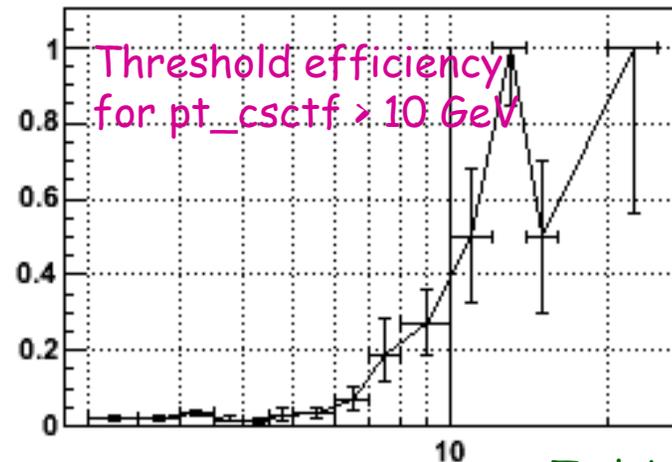
Resolution = $p_{T_global}/p_{T_csctf} - 1$



p_{T_global} , GeV



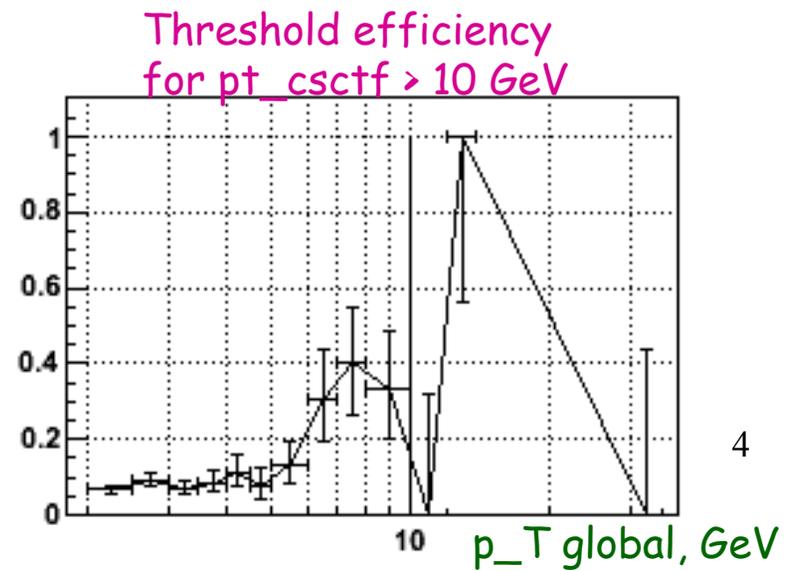
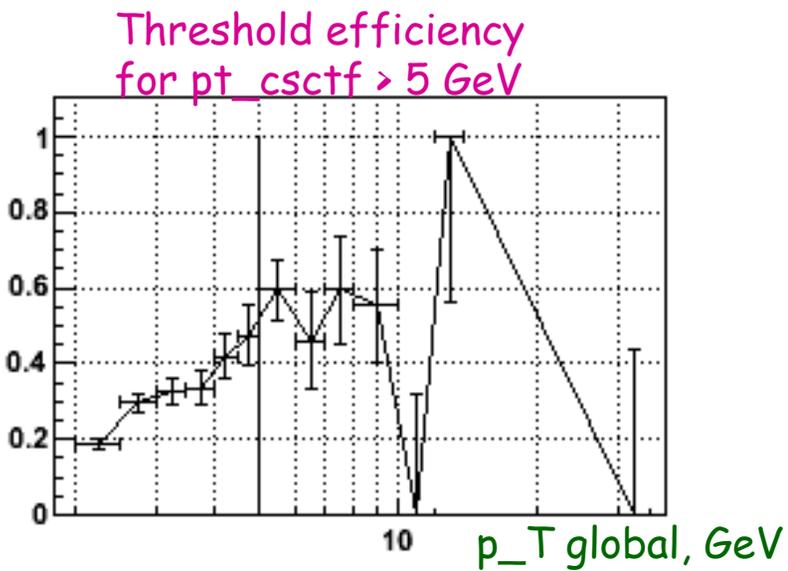
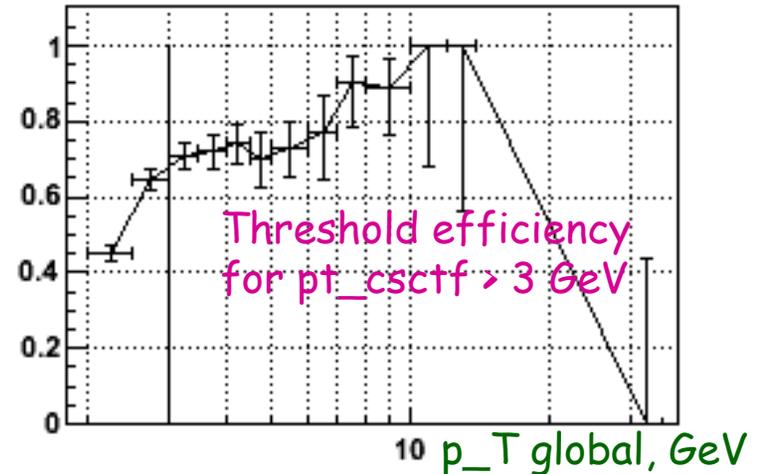
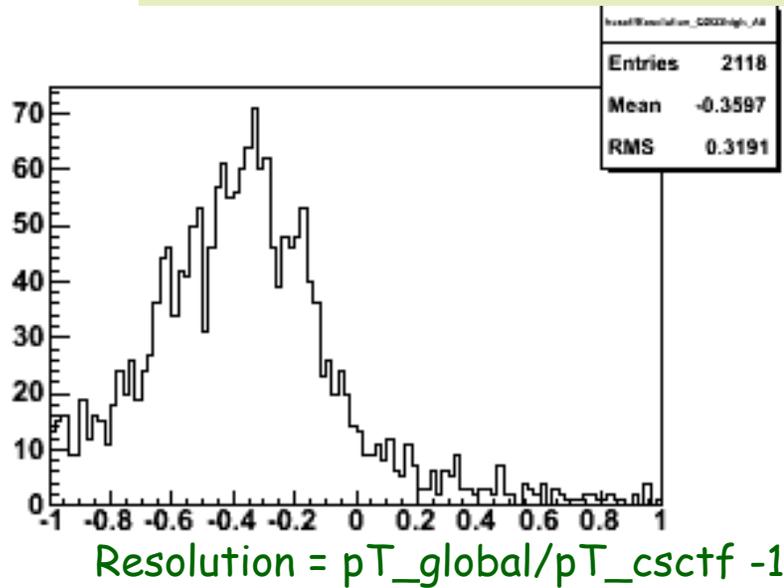
p_{T_global} , GeV



p_{T_global} , GeV

Good resolution ($\sim 23\%$) and threshold efficiency for golden region of eta

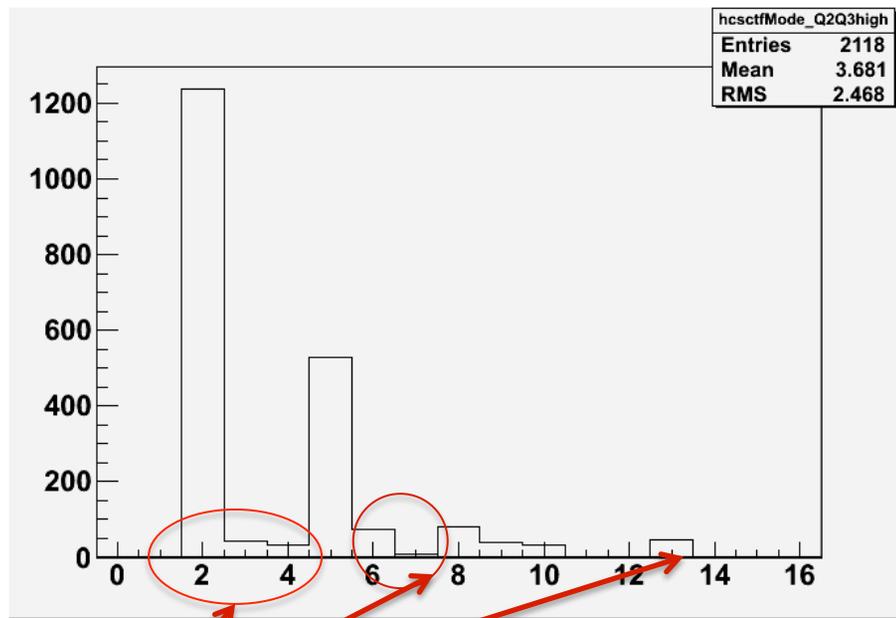
PtLUTs at Point 5: Q2&Q3, high $|\eta| > 2.1$



Low resolution ($\sim 31\%$) and low threshold efficiency in high eta region

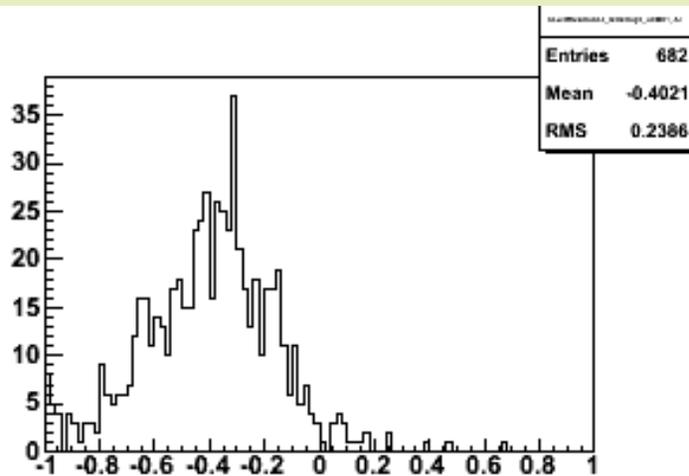
PtLUTs at Point 5: Q2&Q3, high $|\eta| > 2.1$

Mode of the CSCT track at high eta region:

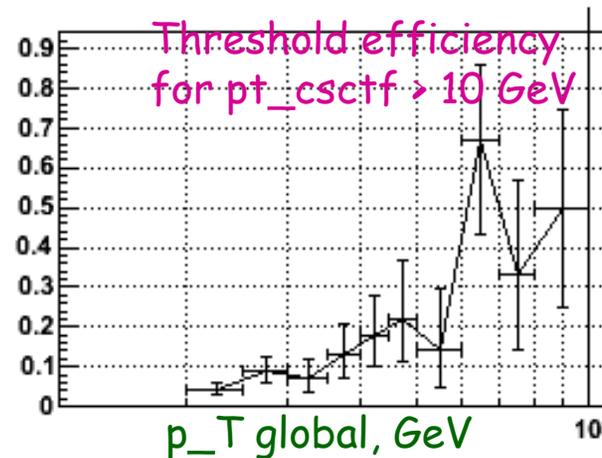
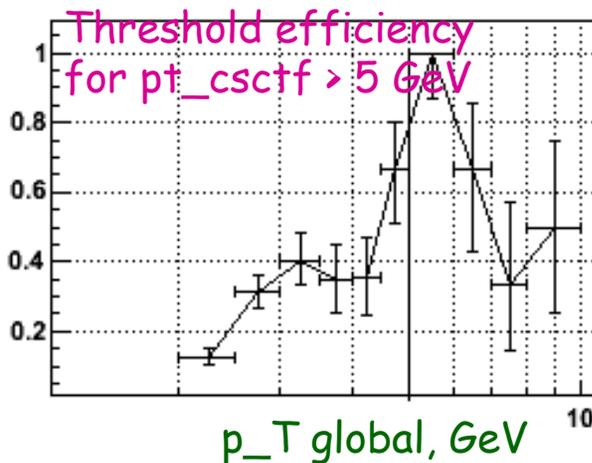
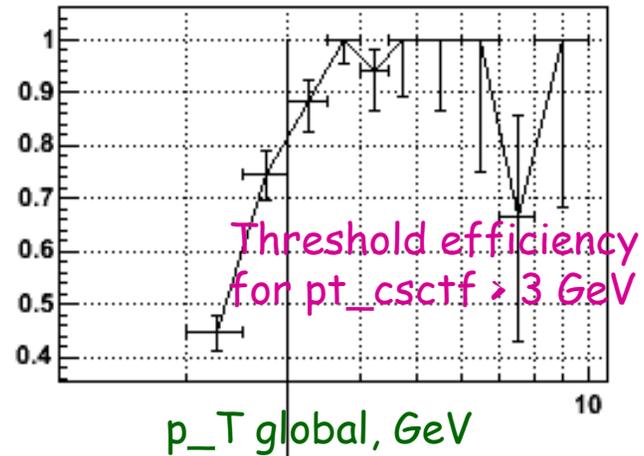


- Most tracks have ME1 station
- ME1 station has problem with phi assignment at high eta
- Analyze high eta region without tracks with ME1 (see next slide)

PtLUTs at Point 5: Q2&Q3 without ME1, high $|\eta| > 2.1$



Resolution = $p_{T_global}/p_{T_csctf} - 1$



- ✓ Good resolution ($\sim 23\%$) and high threshold efficiency (see threshold 3 GeV, for threshold 5 and 10 GeV no statistics) in high eta region for tracks without ME1
- ✓ CSCTF tracks with ME1 at high eta region are needed in separate study in future

Monte Carlo: PtLUTs Likelihood Method

- ✓ We have generated a new PtLUT and test on
 - official MC from the L1 DPG
 - "Super Pointing" muons from CRAFT 09

- ✓ The new PtLUT shows improvements for (see next slide):
 - ✓ Quality 3 muons with low pT ($pT < 5 \text{ GeV}$)
 - ✓ Quality 1 muons in all η bins
 - ✓ Quality 2 muons in high η bins
 - ✓ muons in the overlap region (DT-ME) for Quality 1, 2 and 3
 - ✓ equivalent performances in the other regions

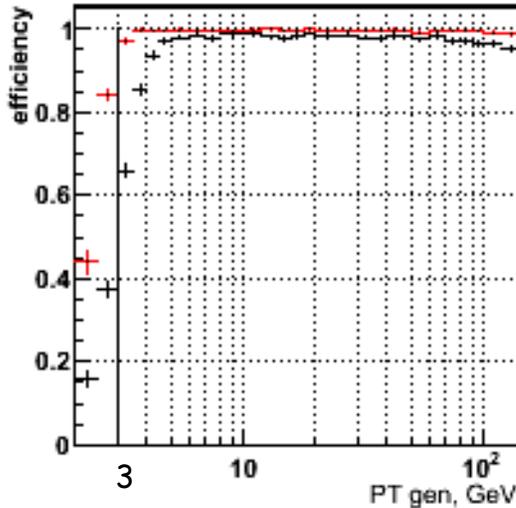
- ✓ PtLUTs based on Likelihood method
 - are uploaded at Point 5 (4 March 2010)
 - O2O is ready and will be implemented in CMSSW_3_6_X
 - check pt assignment with new collision data

- ✓ The latest PtLUTs information you could find at twiki page:

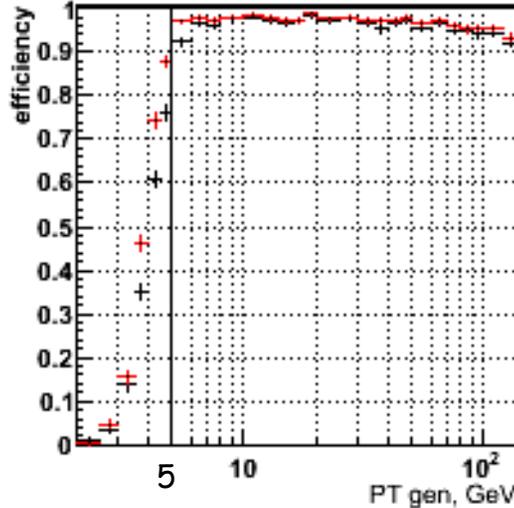
<https://twiki.cern.ch/twiki/bin/view/Main/PtLUTs>

Monte Carlo: PtLUTs Likelihood Method: Performance

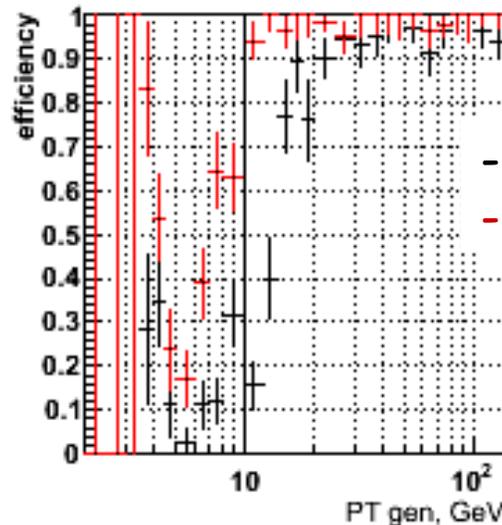
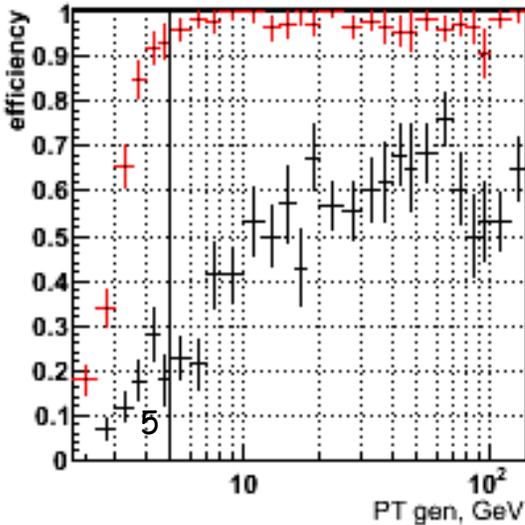
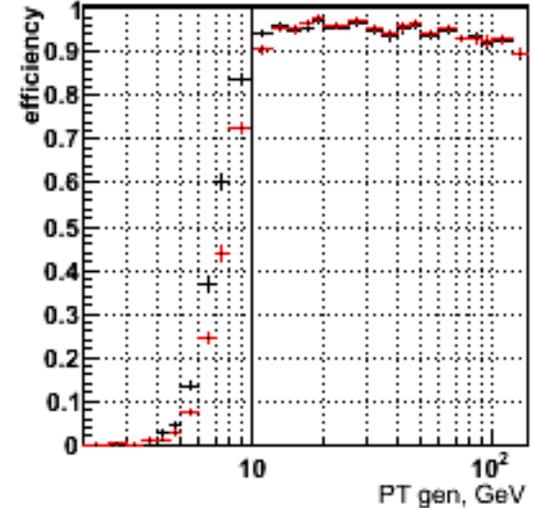
Quality 3 : 3 stations including ME1 for $1.2 < |\eta| < 2.1$



Quality 1: 2 stations without ME1 for $1.2 < |\eta| < 2.1$



Quality 3 in overlap region ME-DT



- old Likelihood method 2001
- new Likelihood method

Conclusion and Plans

- good pt assignment at
 - golden eta region
 - high eta region for tracks without ME1
- bad pt assignment at
 - high eta region for tracks with ME1
 - > possible solution:
 - most of such tracks are with Mode = 2 (ME1-M2-ME3)
 - use only dphi23 for pt assignment ???
- to do:
 - when we have enough statistic to tune ptLUTs with data using global muons