CalTrk Match Simulation

Erich W. Varnes
University of Arizona
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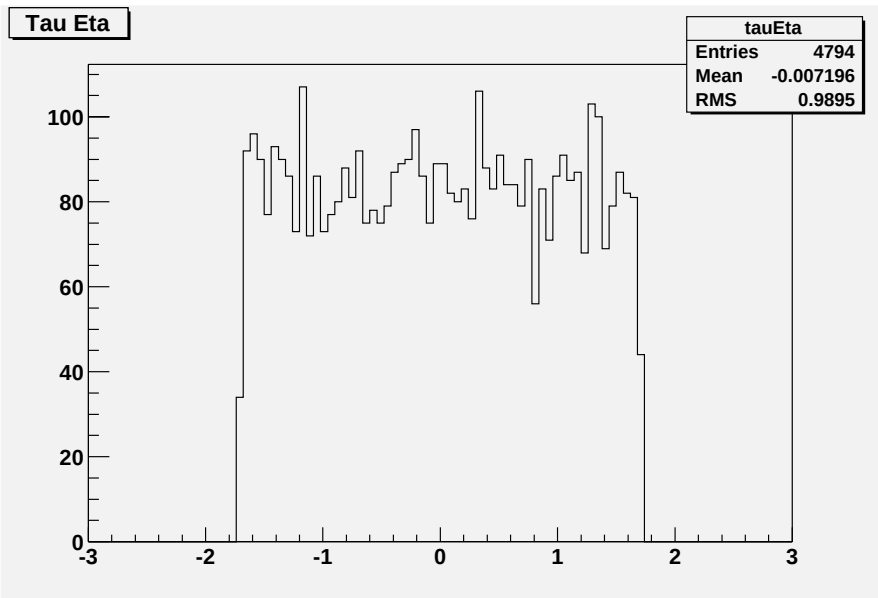
Introduction

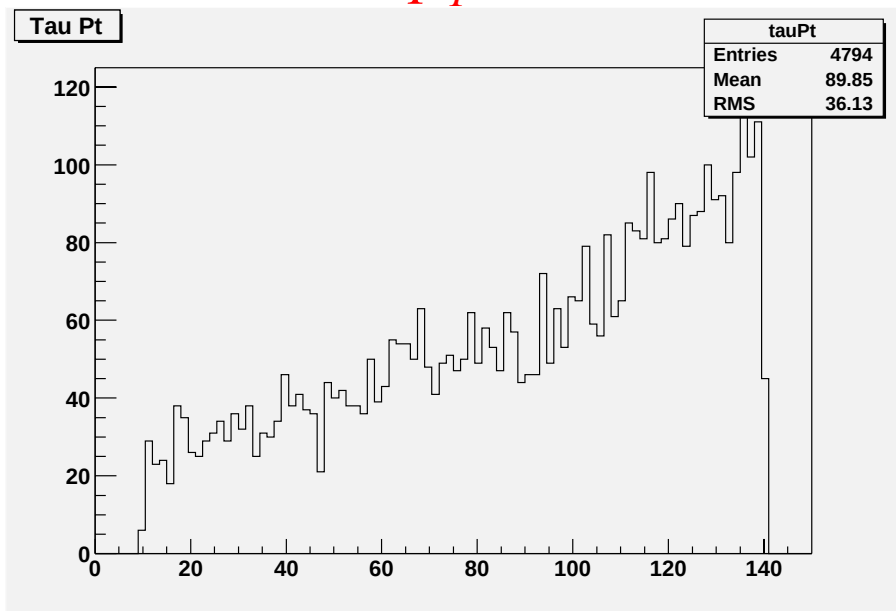
- Studies shown here are based on running tsim_l1l2 and tsim_l1cal2b in the same job, then doing roottuple analysis on the output
- Primary sample is single tau MC, with the tau decaying to hadrons.

Properties of the τ Sample

η



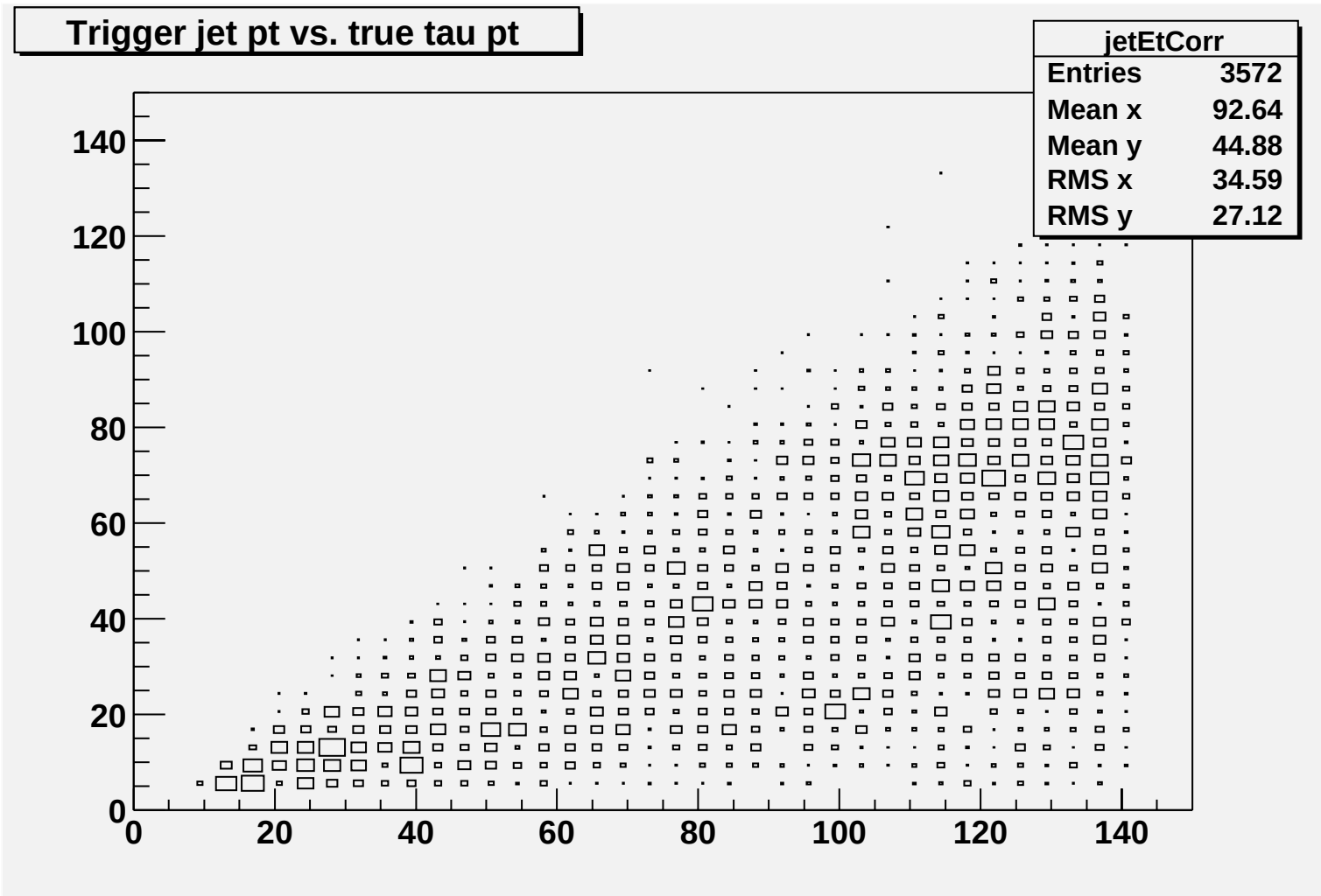
p_T



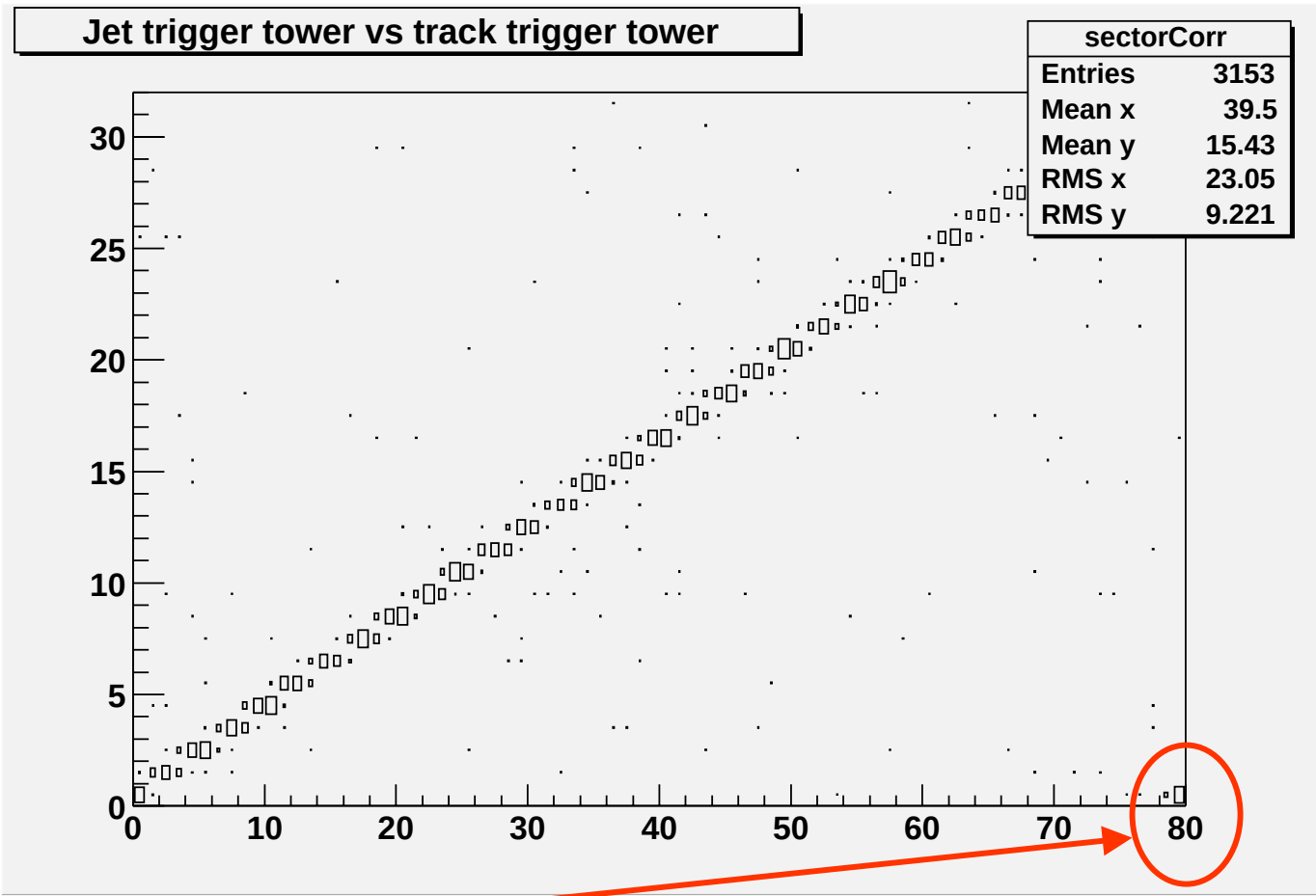
- Actually, the parent sample extends to η = 3, but I only consider those with η < 1.7 to (roughly) match the CFT coverage

L1Cal Response

- Transverse energy of jet nearest to true tau direction vs. MC tau p_T:



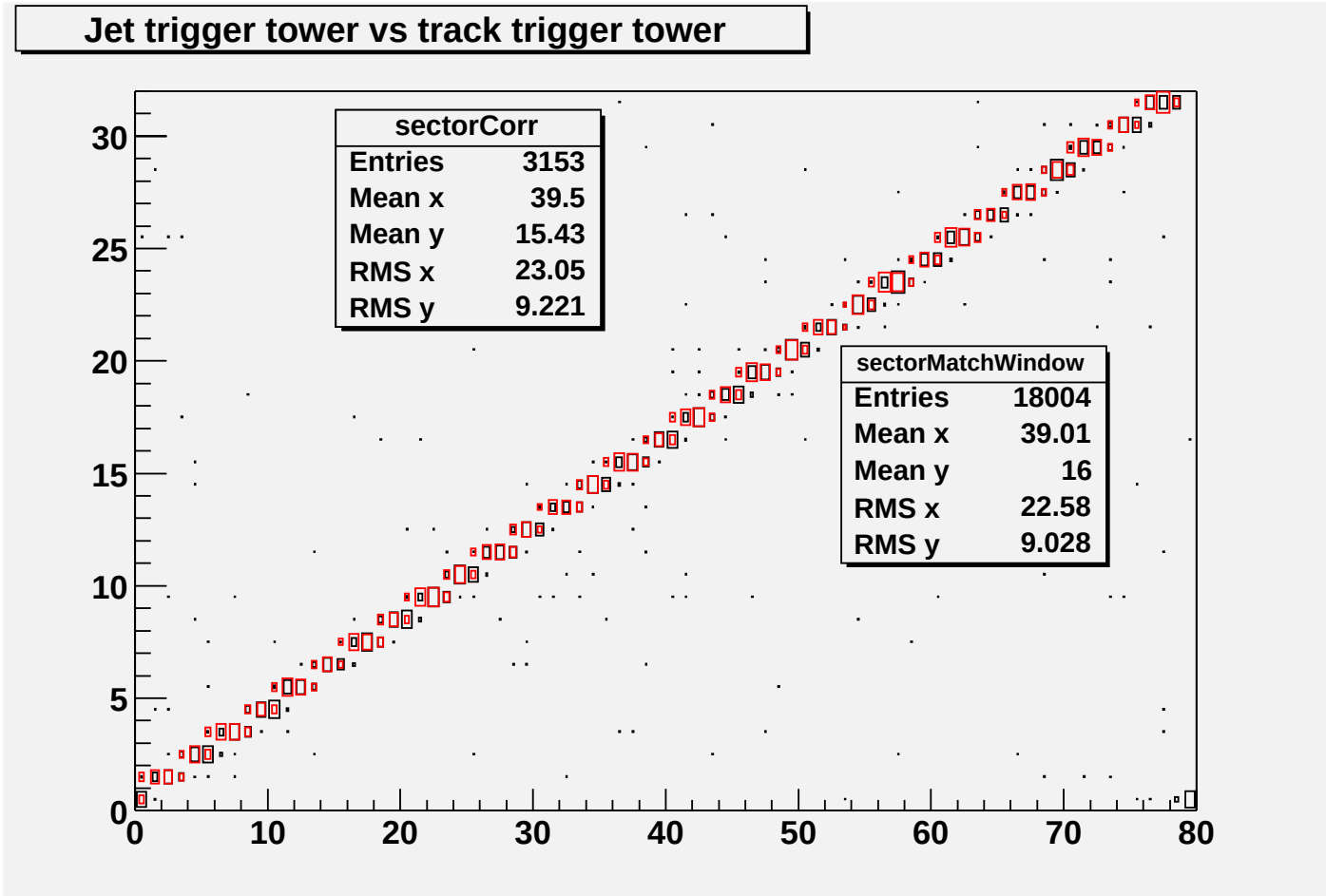
Correlation between L1Cal, L1CTT Sectors



- One oddity – CTT triggers in sector 79 match jets in tower 0. Do CTT and L1Cal define different starting points in ϕ?

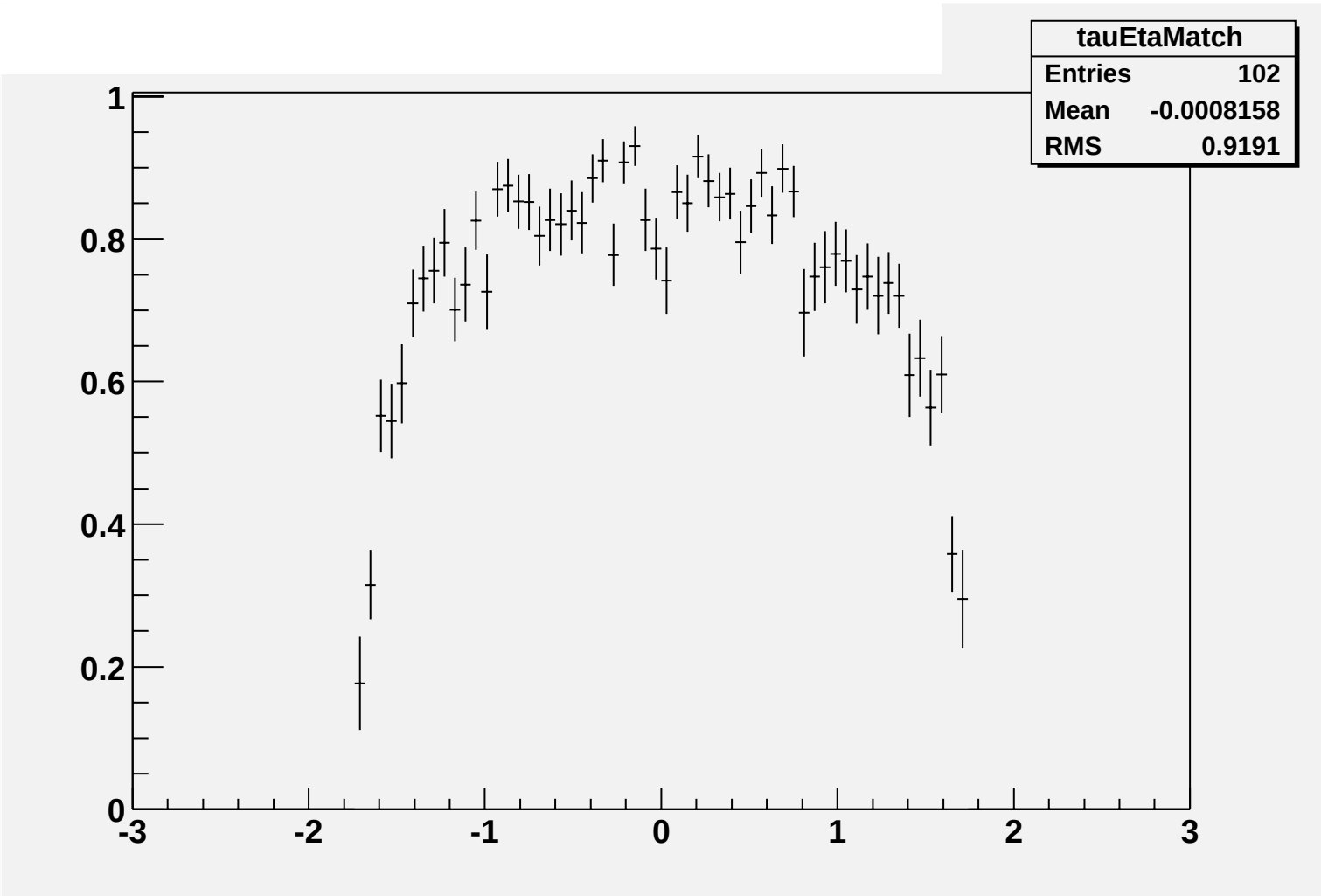
Strawman Matching Scheme

- I declare a match when a CTT sector overlaps a jet tower
- Also permit "off-by-one" for CTT sectors on the edge of jet tower to allow for finite resolution

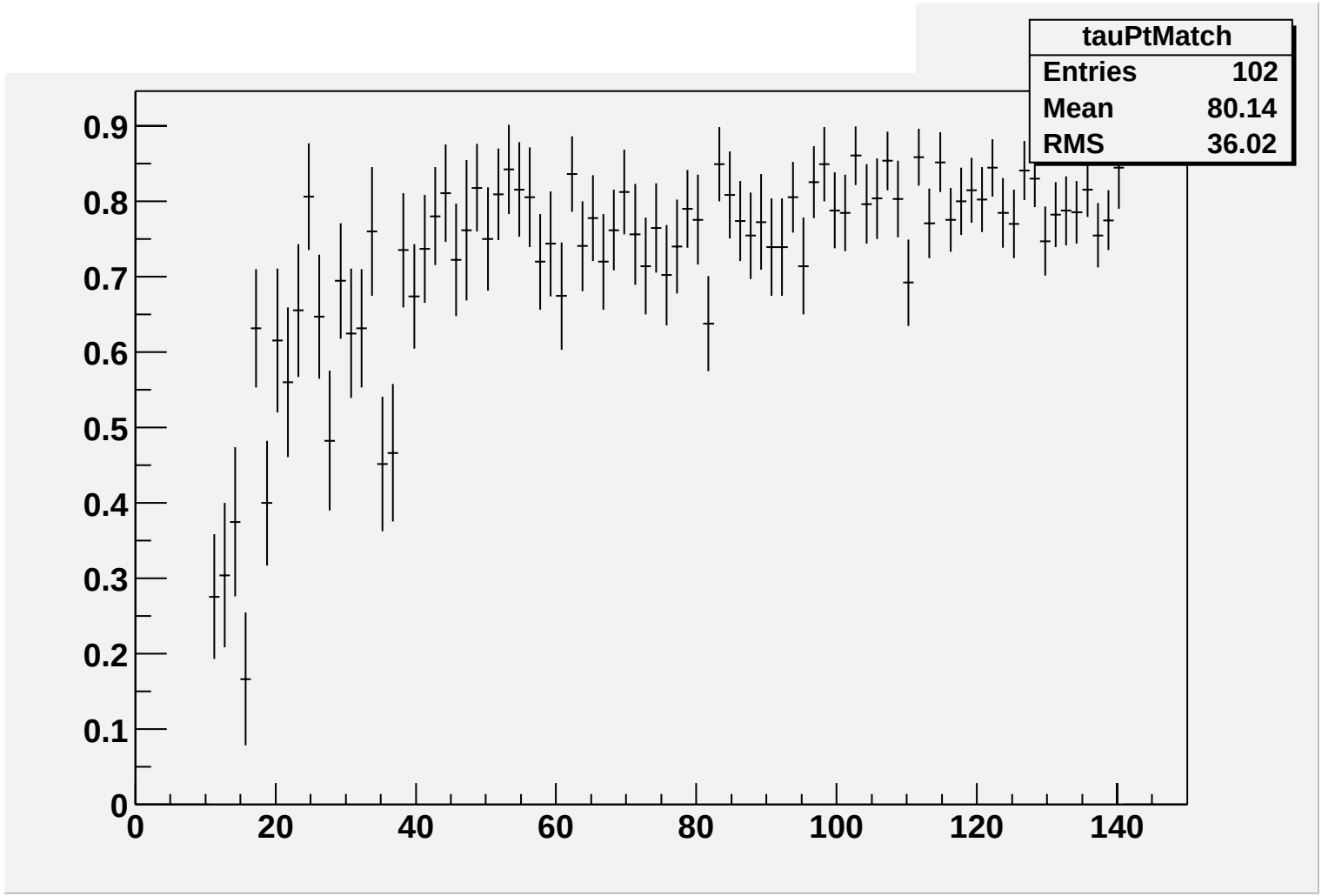


Matching Efficiency

- Efficiency vs. η (76% overall)

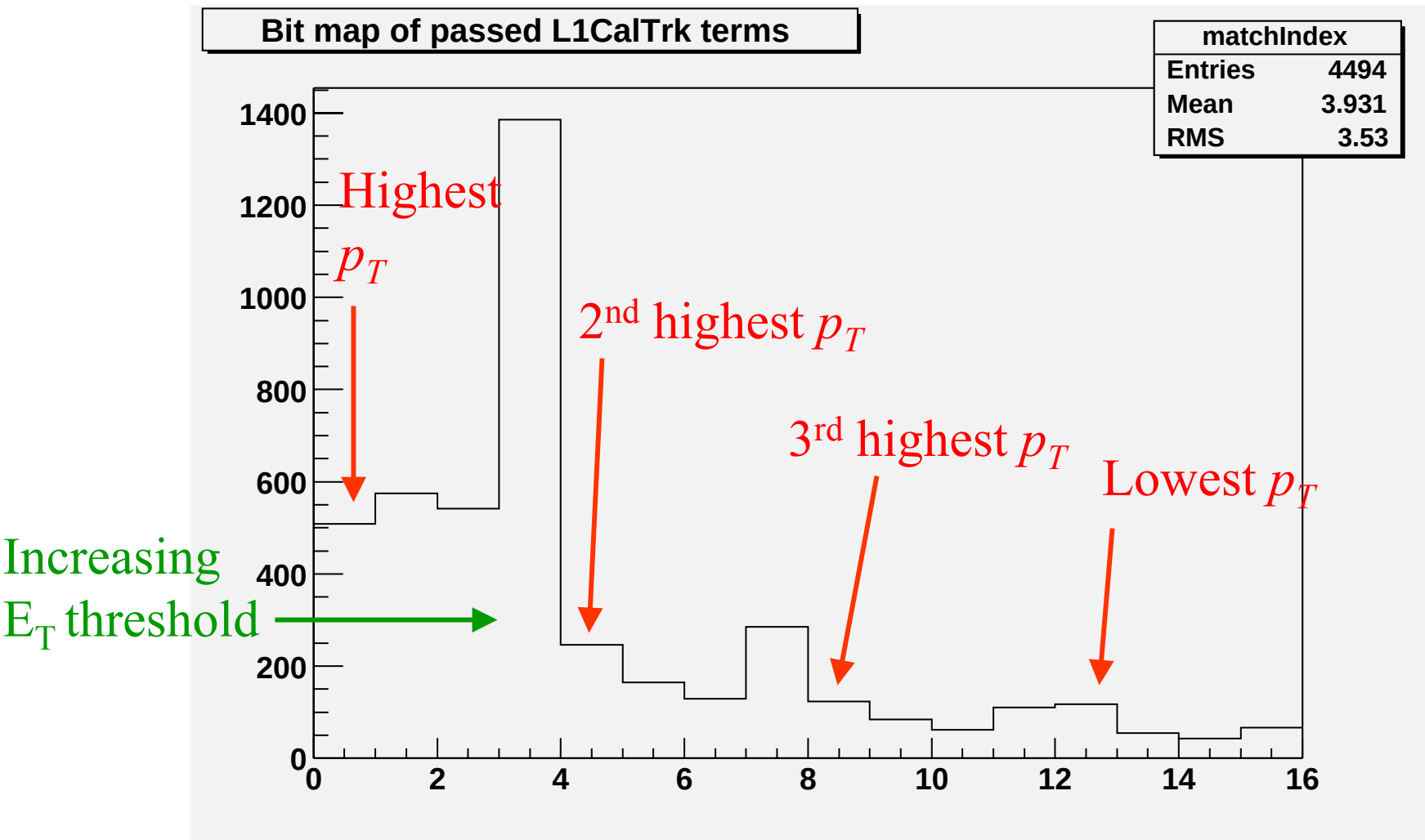


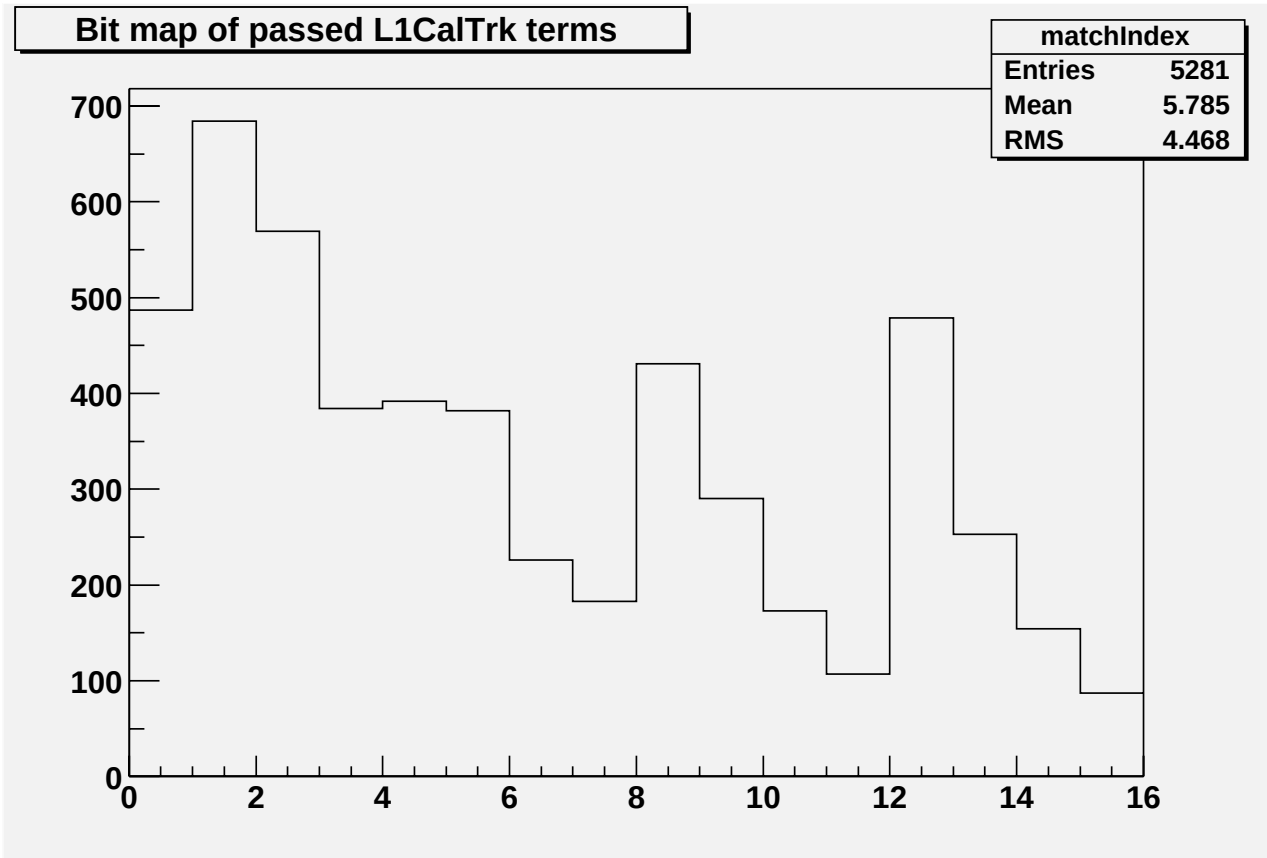
- Efficiency vs. p_T



Strawman Trigger Bits

- If I define trigger bits based on CTT p_T and L1Cal E_T, I find the following frequency of fired bits (L1Cal thresholds are 4, 20, 35, 50 GeV, chosen arbitarity):



Tests on 135 GeV H→ ττ MC

- Only events with both taus going to hadrons are used
- 2112 events in sample
- 1979 have at least one CTT-L1Cal correlation (94%)