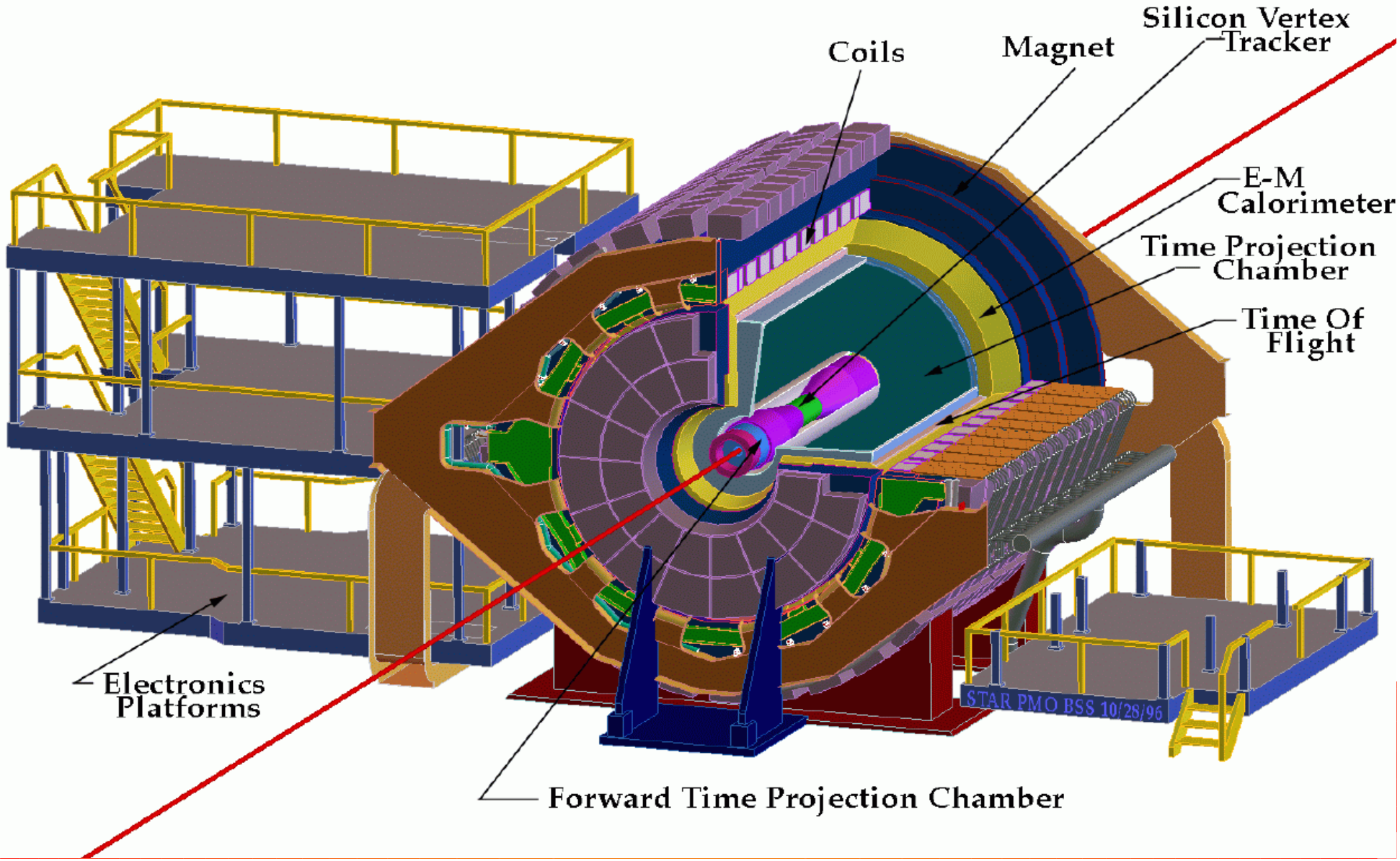
STAR Integrated Tracker Review

SVT Implementation Evaluation

Presentation Overview

- Brief Introduction to the SVT
- Brief Introduction to EST
- Summary of Data
- Analysis
- Conclusions

STAR Detector



EST Track Matching

- Start with TPT tracks
- Perform simple helix projection to the outer SVT barrel
- Search for a hit (1cm search radius)
- If a hit is found, associate the hit with the track and refit
- Require 2 or more hits to be called an EST track

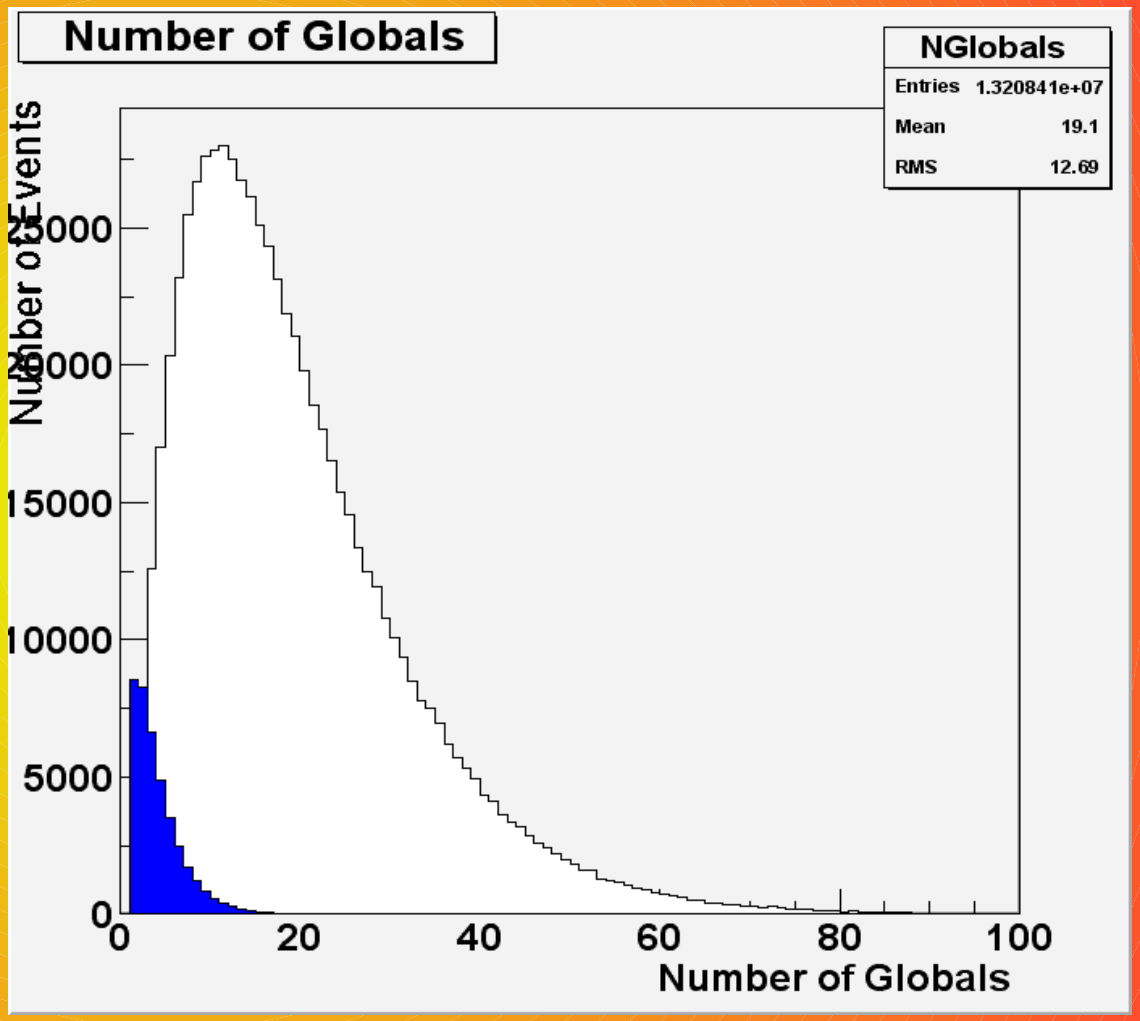
NOTE: EST does <u>not</u> create new tracks

Data Summary

- ~700k *pp* events processed with EST
- ~200k *pp* events processed with STI
- Events are from the same runs
- *pp* events provide a cleaner environment for matching
- Pseudoefficiency

EST Global Track Distributions

- Only L0 Trigger Word Cut
- Number of EST Matched Global Tracks in Blue
- Number of Global Tracks in White



EST Primary Track Distributions

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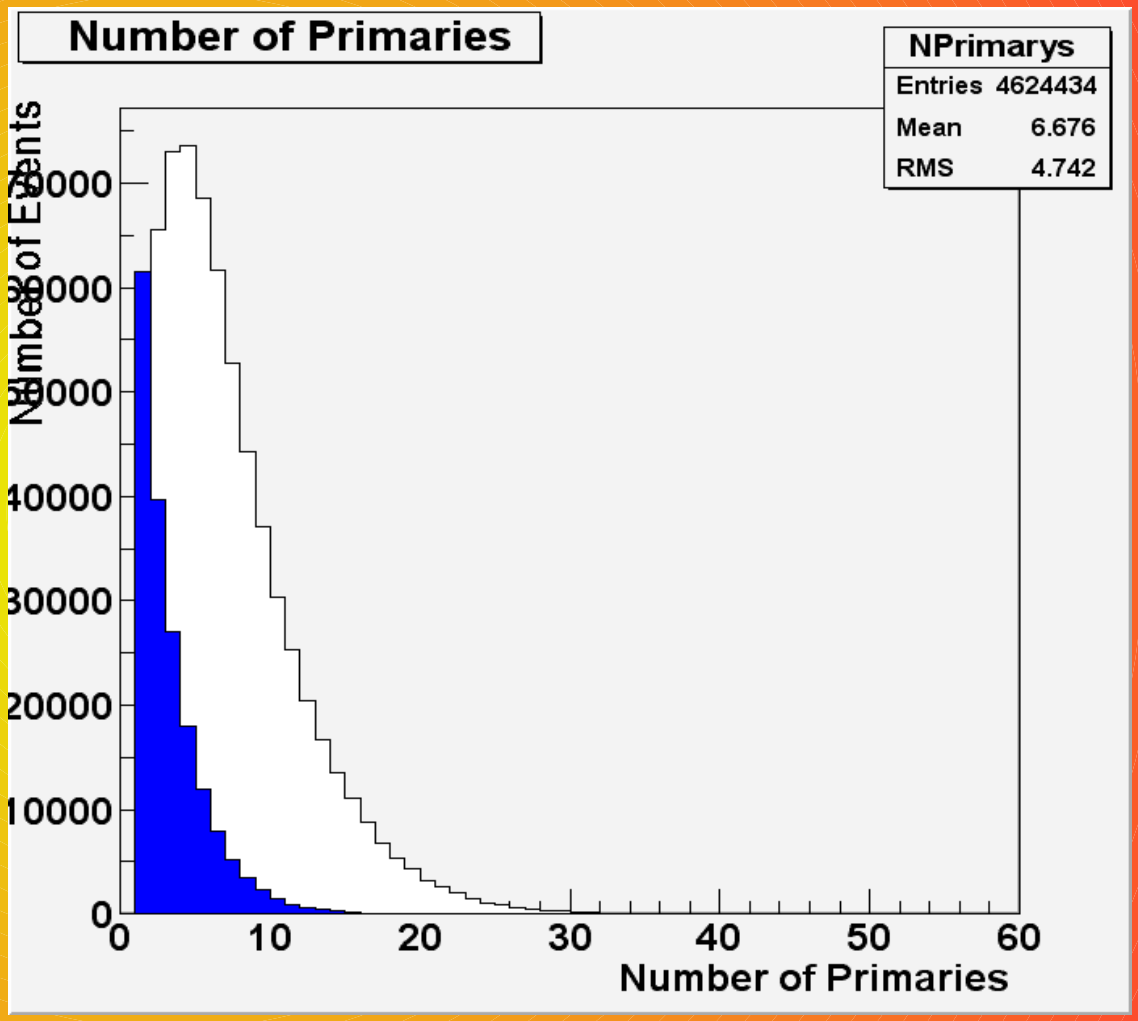
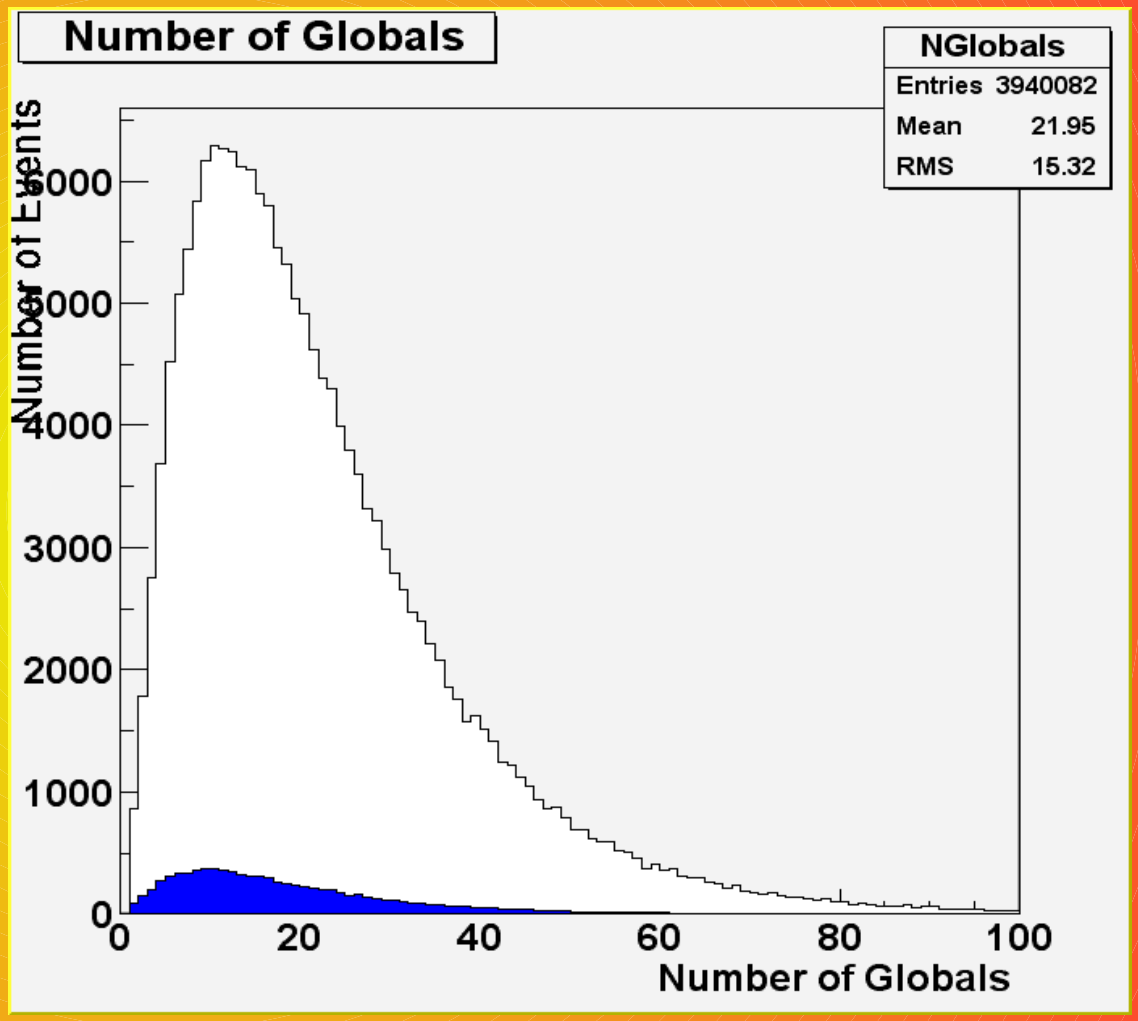


STI Global Track Distributions

- Only L0 Trigger Cut
- Number of STI Matched Global Tracks in Blue
- Number of Global Tracks in White



STI Primary Track Distributions

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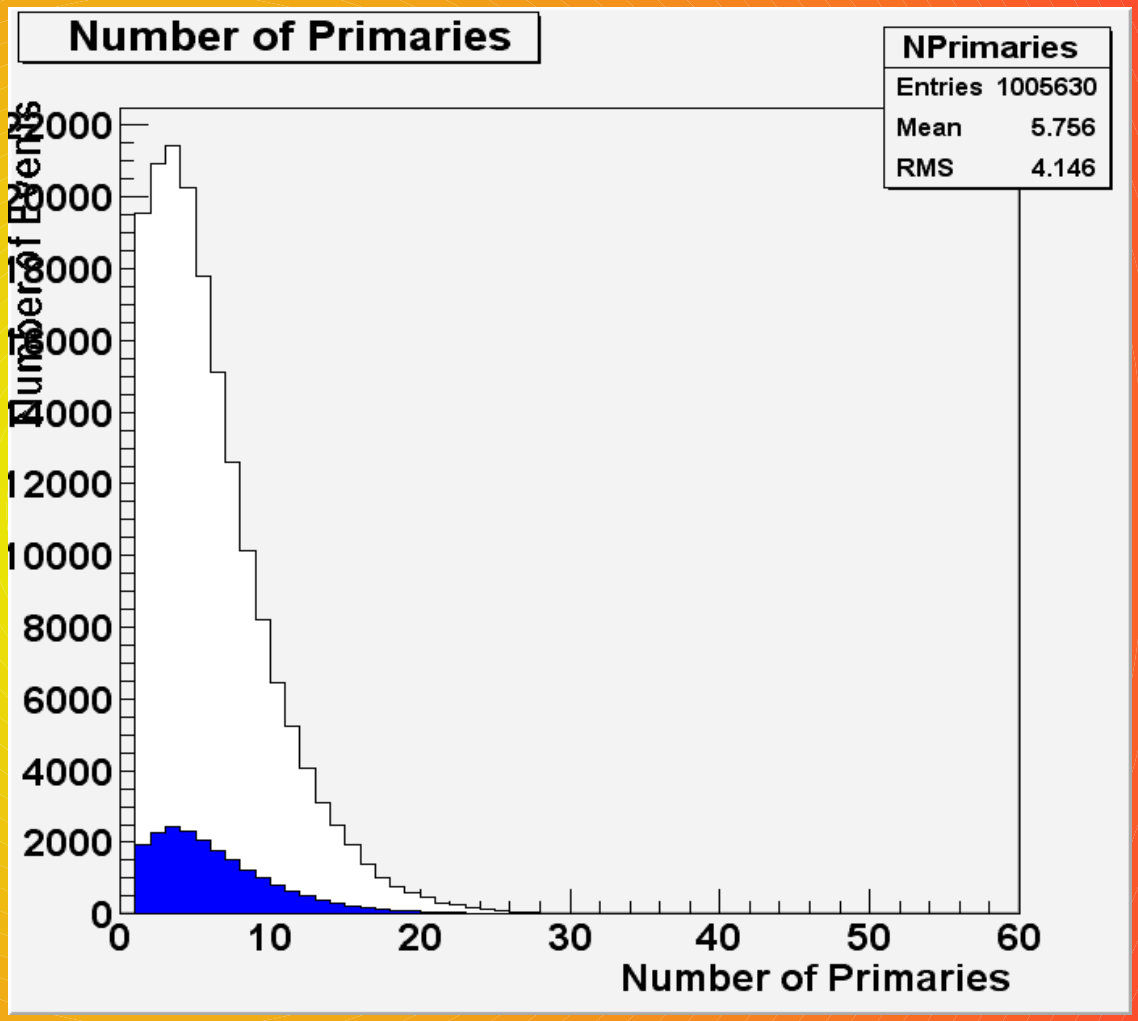
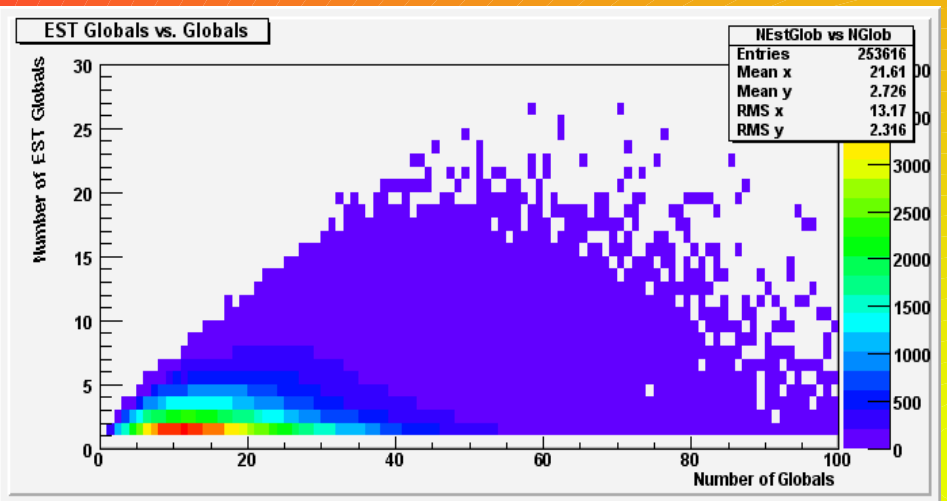
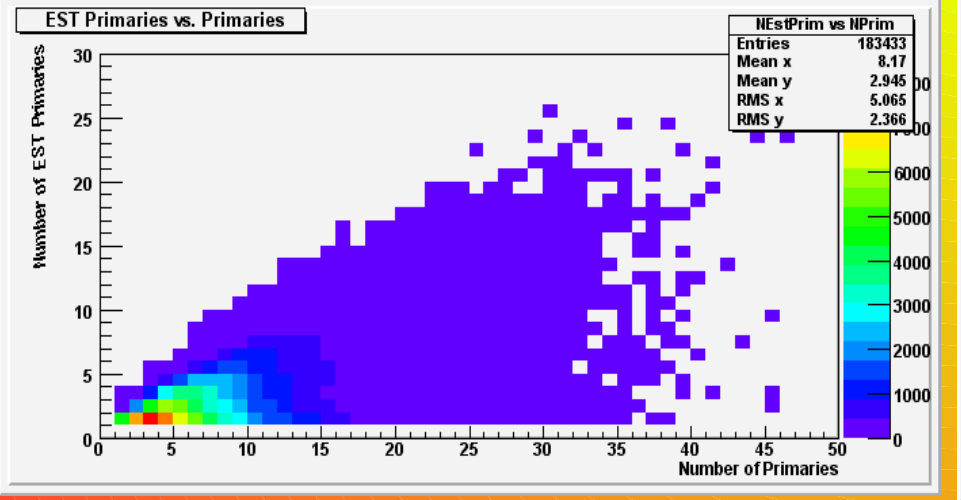


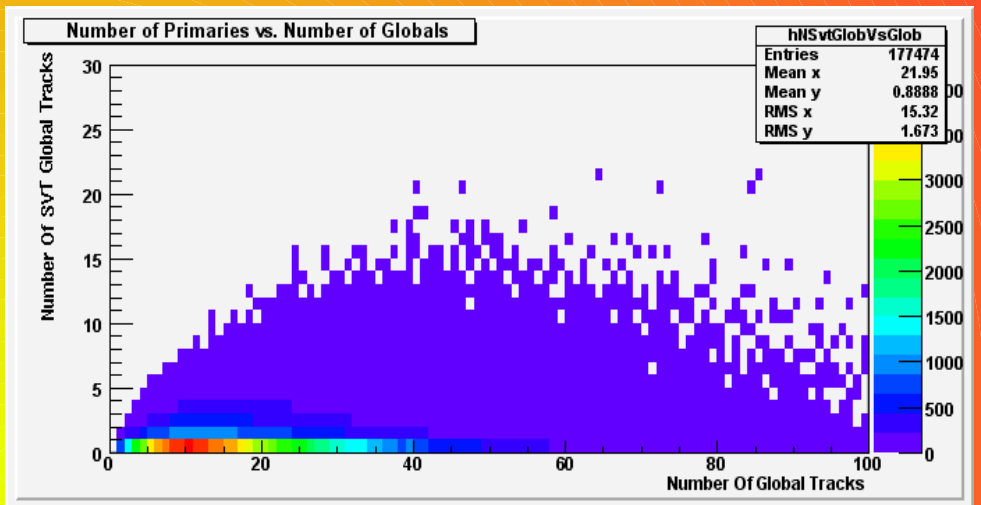
Self-Scaling

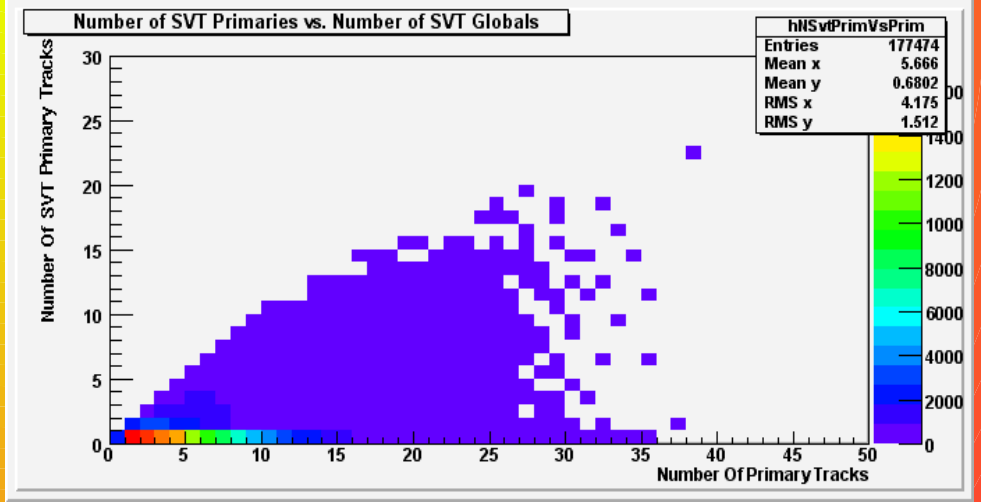
EST Self-Scaling





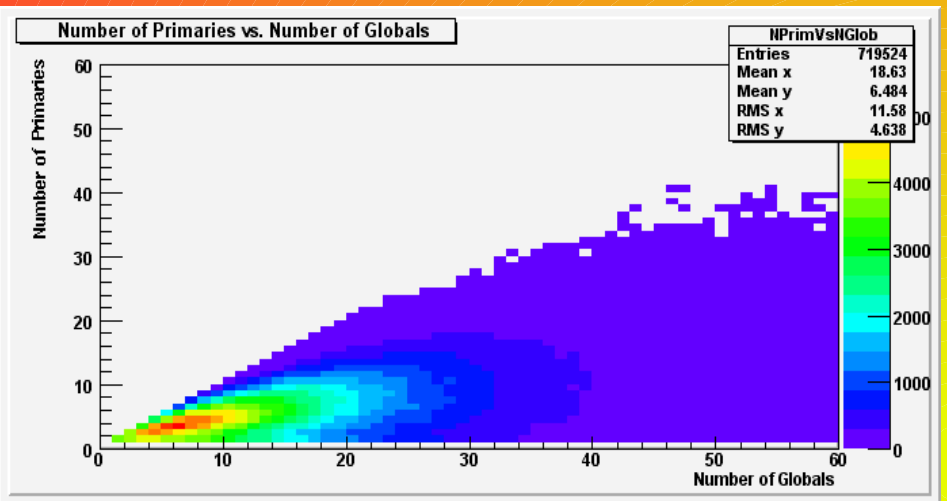
STI Self-Scaling

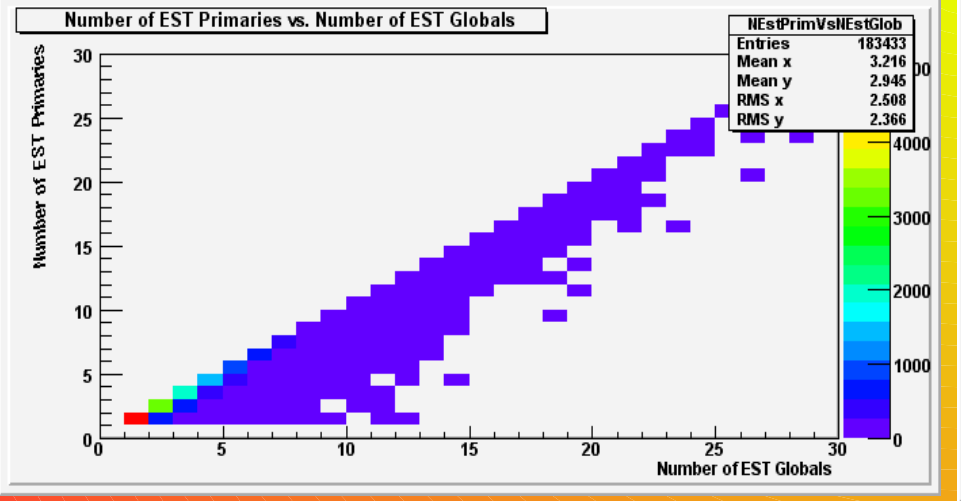




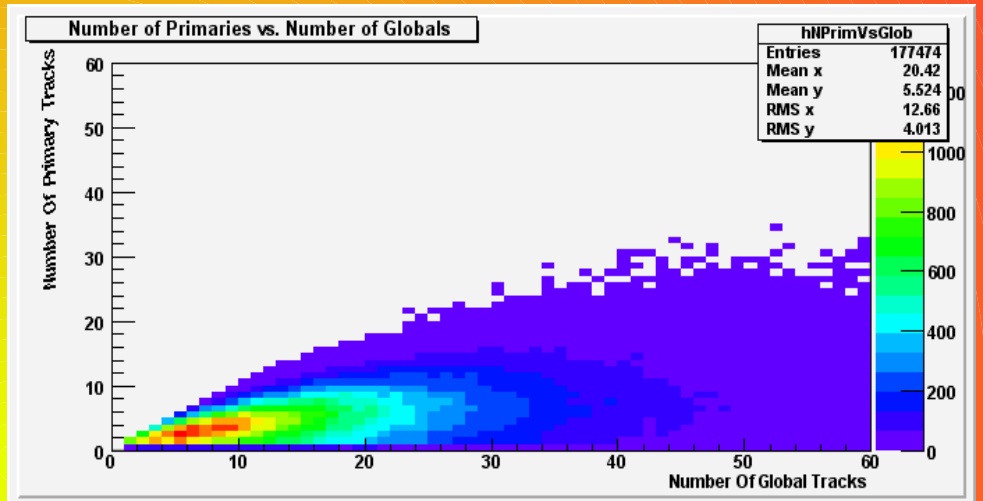
Primary Scaling

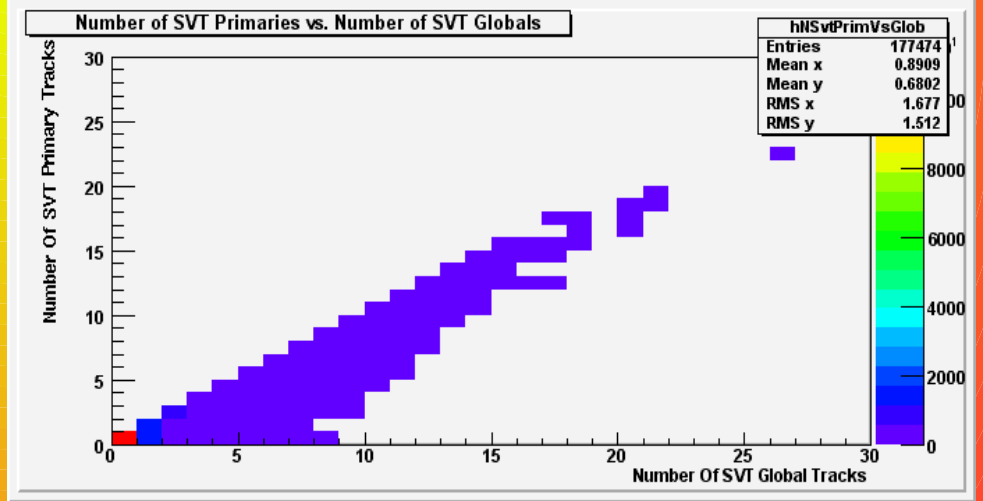
EST Primary Scaling





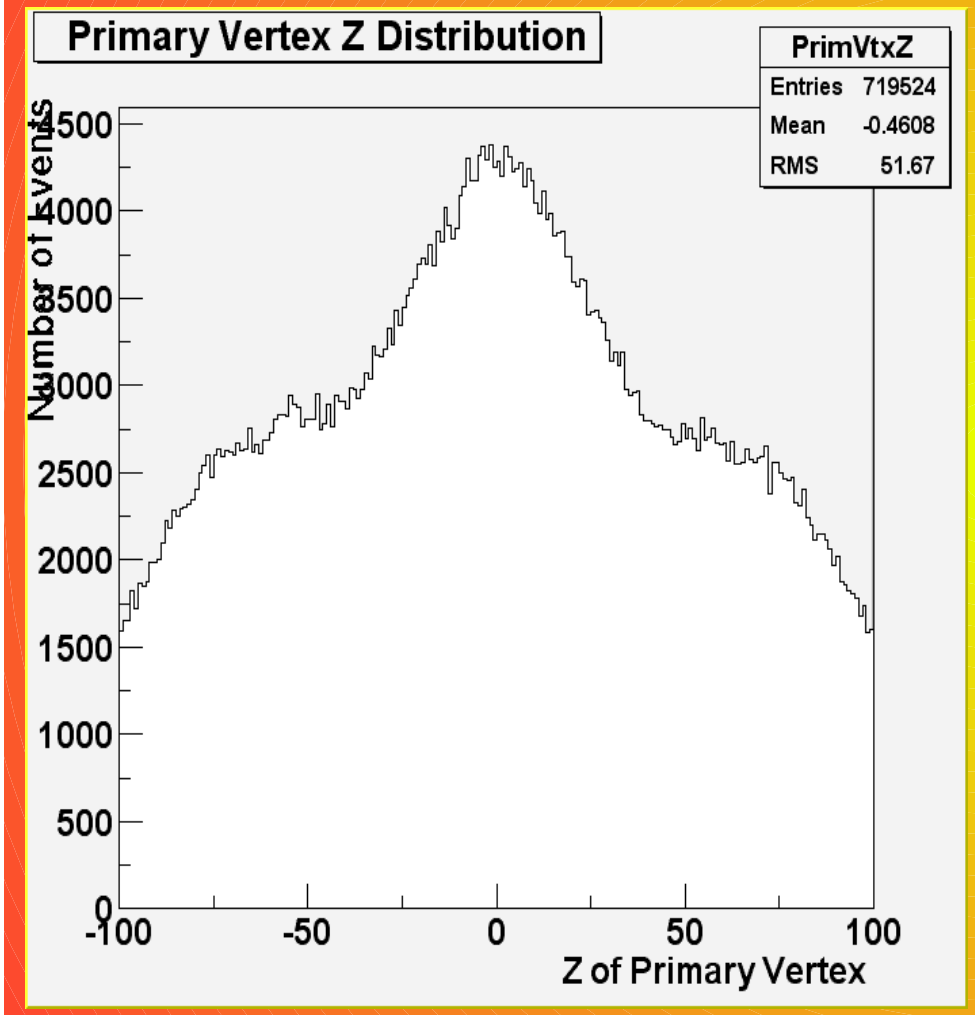
STI Primary Scaling



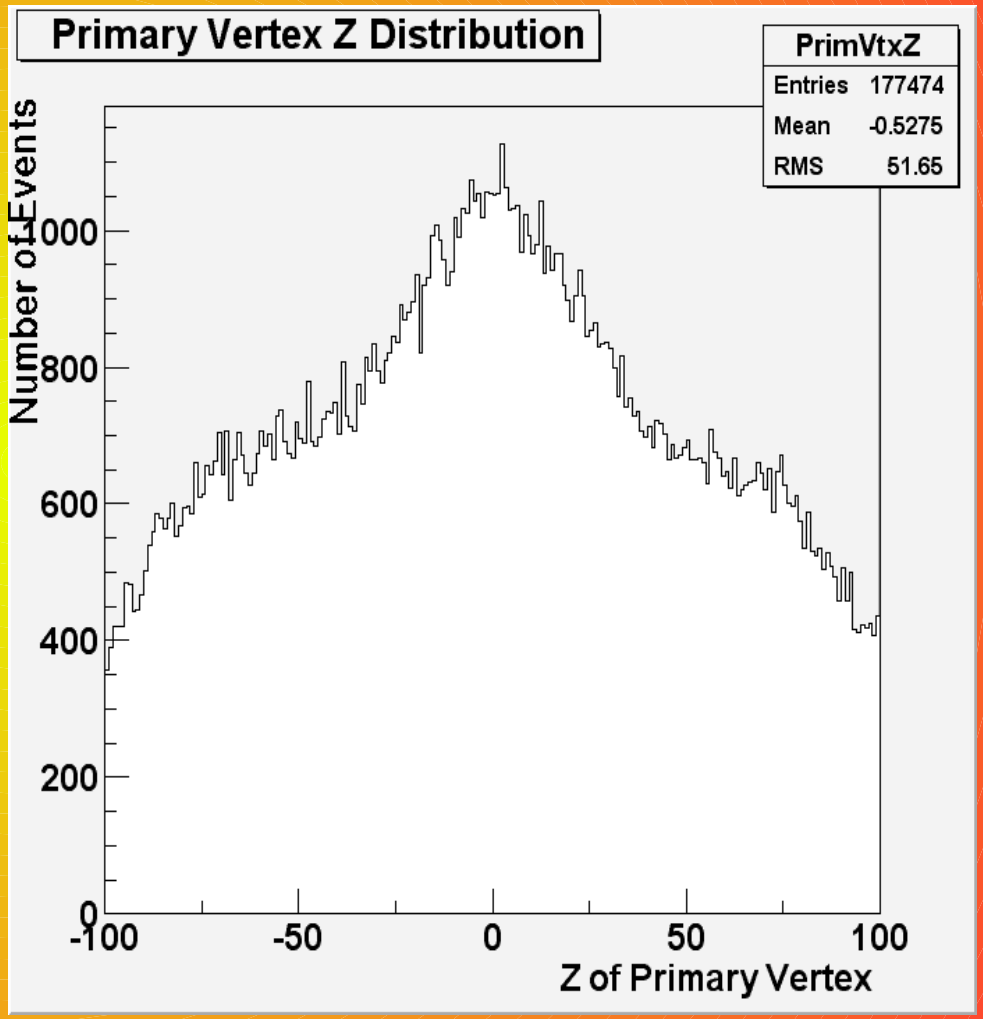


Primary Vertex Z Distributions

EST

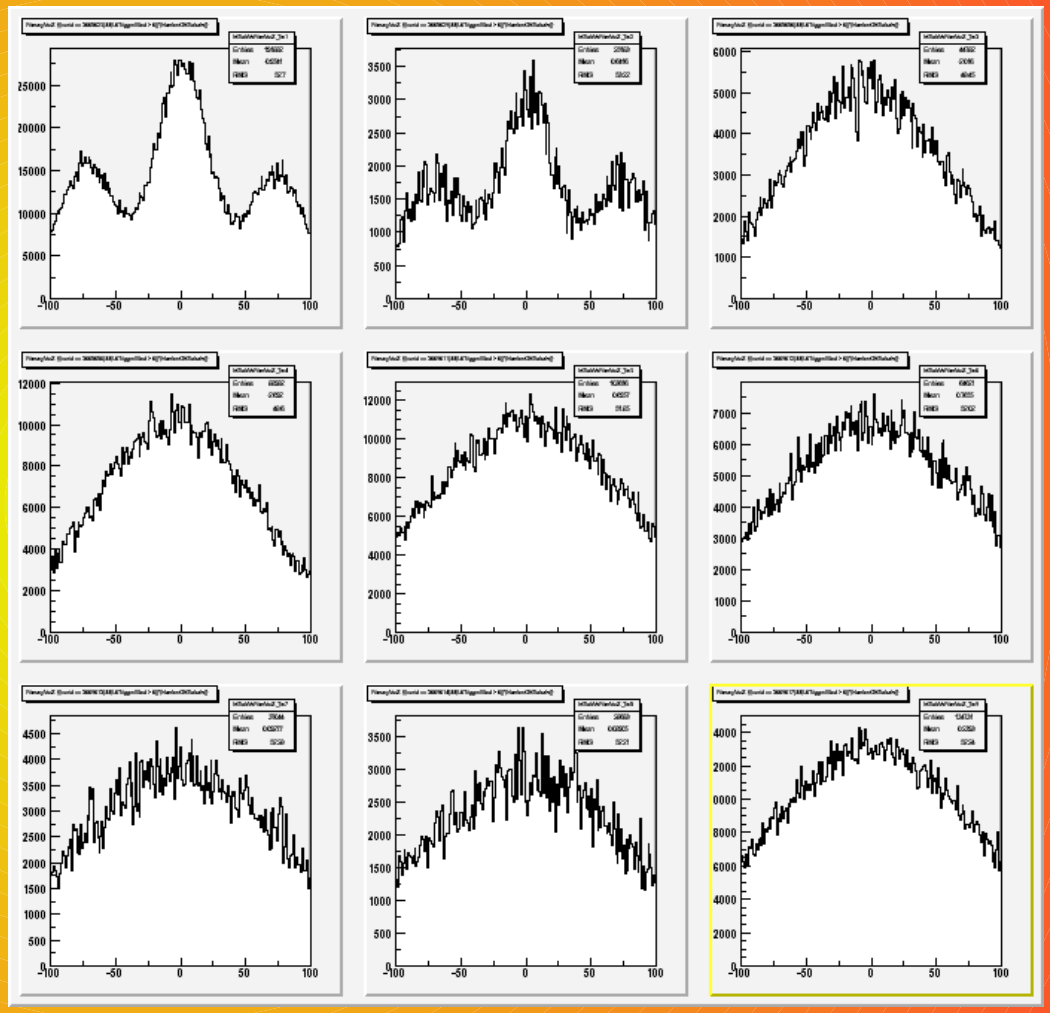


STI



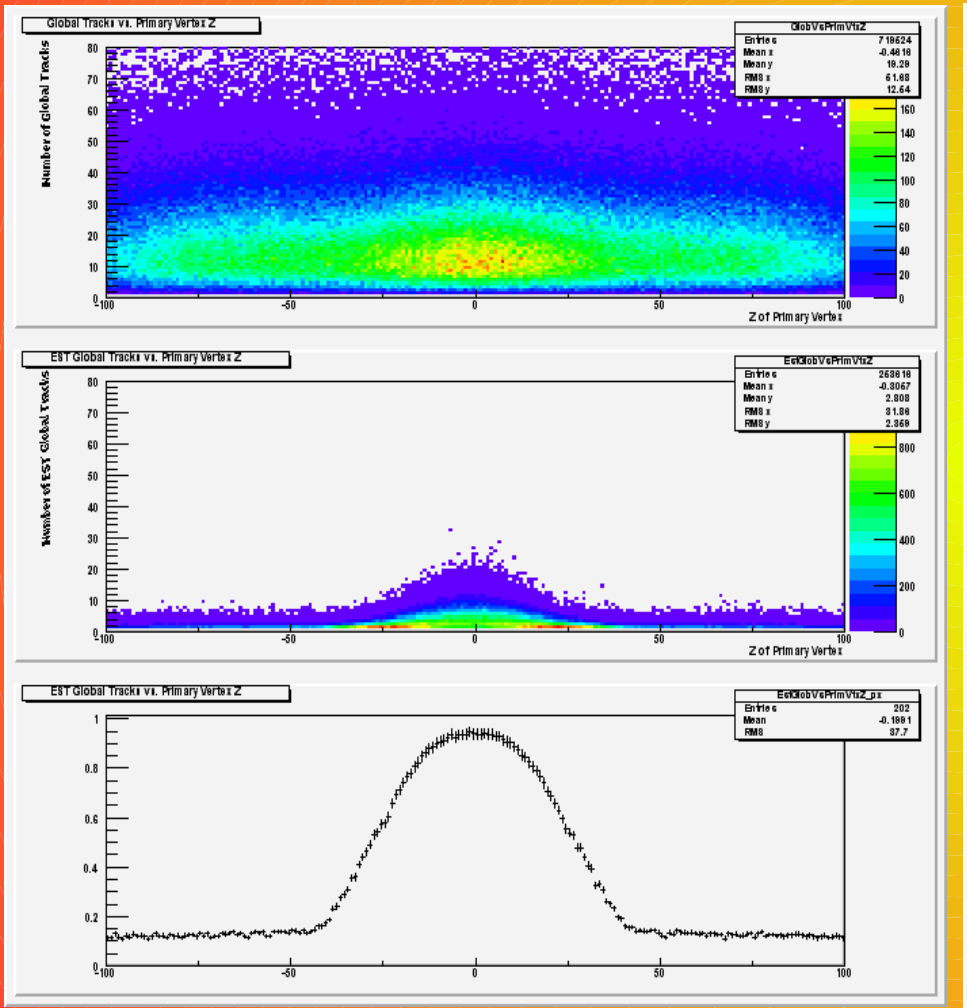
Primary Vertex Z Distributions

- Odd shape due to 2 runs
- RHIC 200MHz Clock

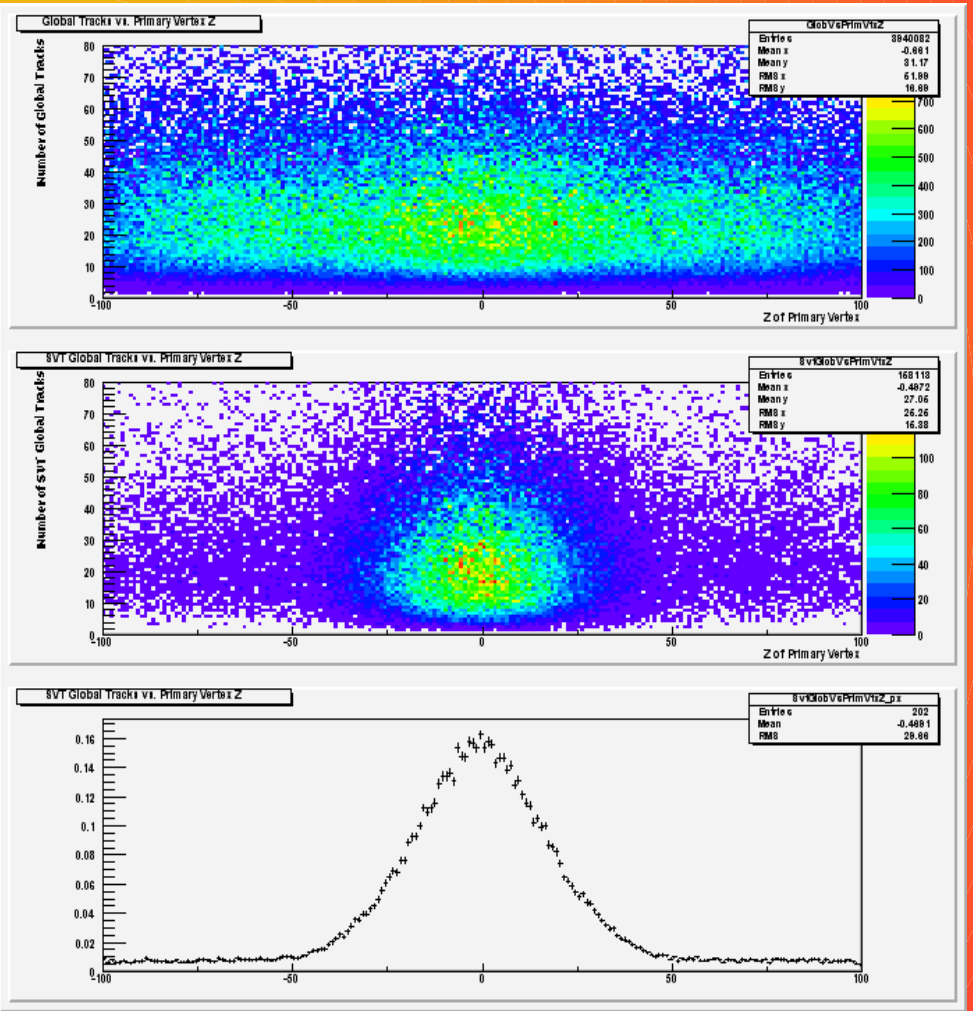


Global Matching Efficiency vs. Primary Vertex Z

EST Global Tracks

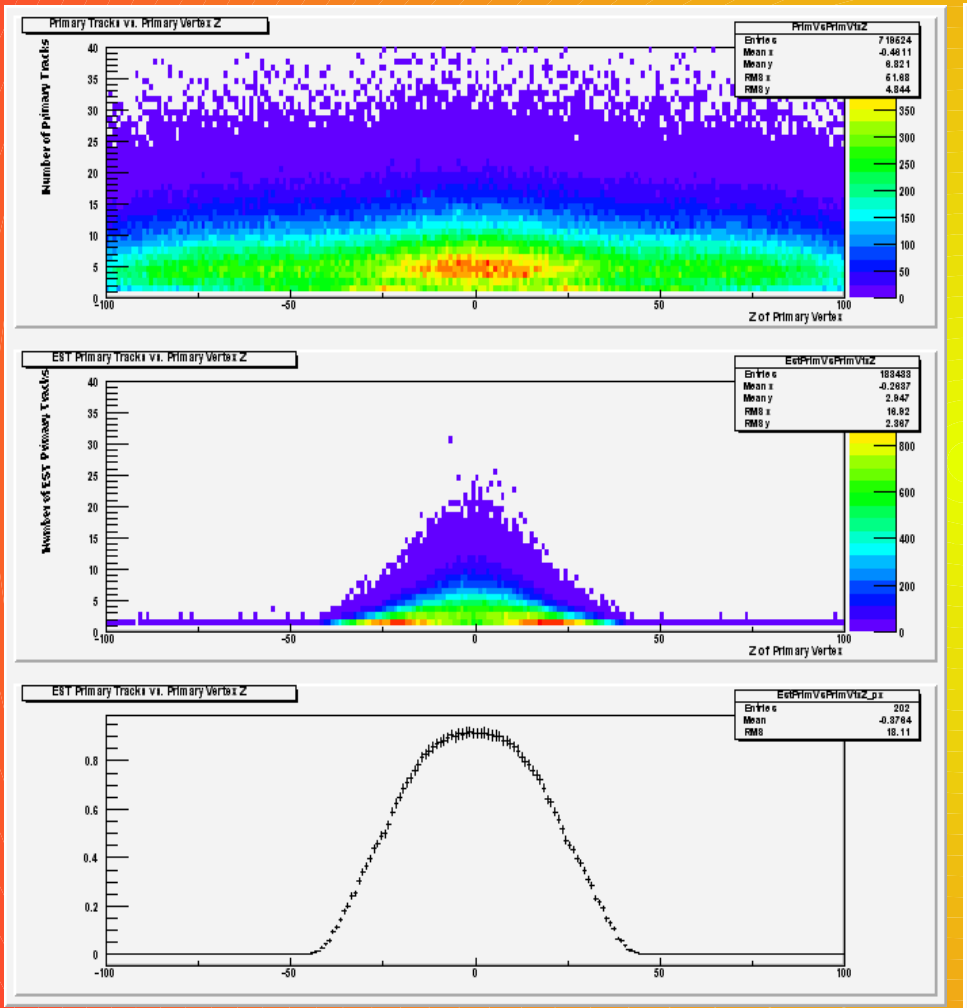


STI Global Tracks

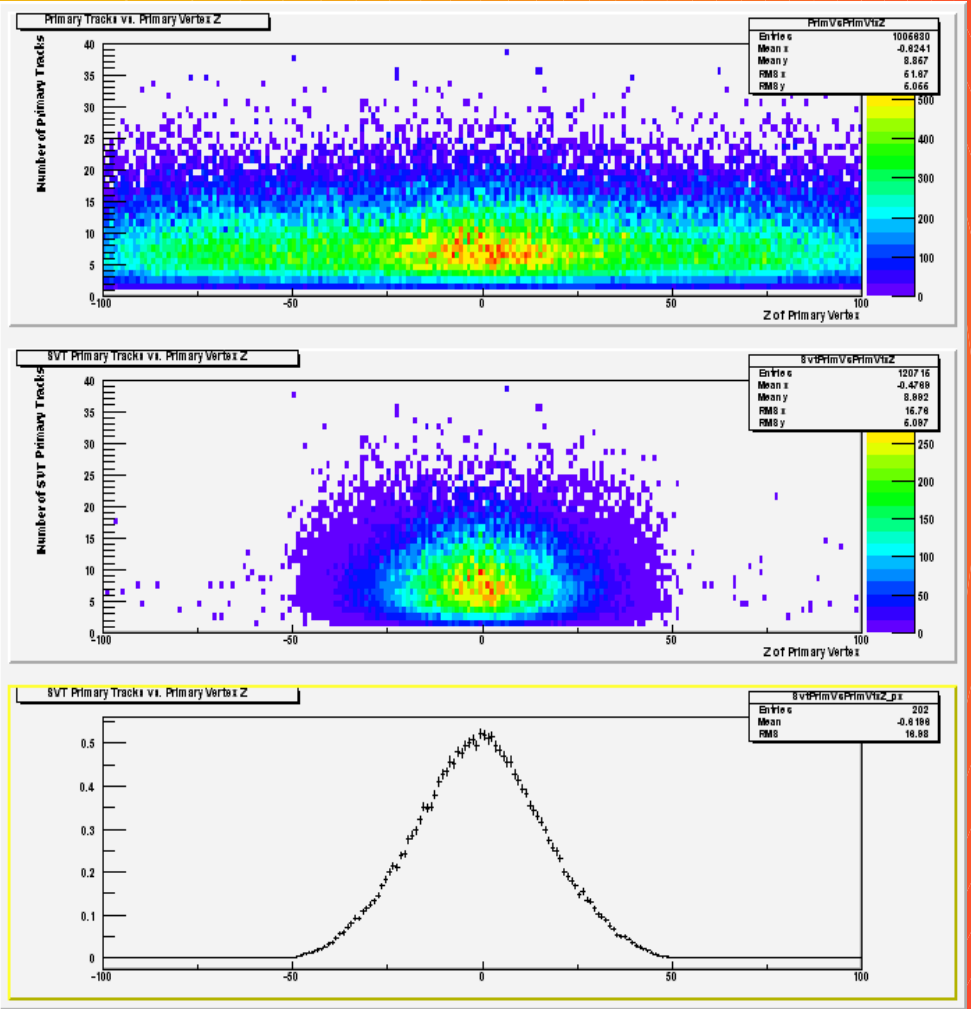


Primary Matching Efficiency vs. Primary Vertex Z

EST Primary Tracks

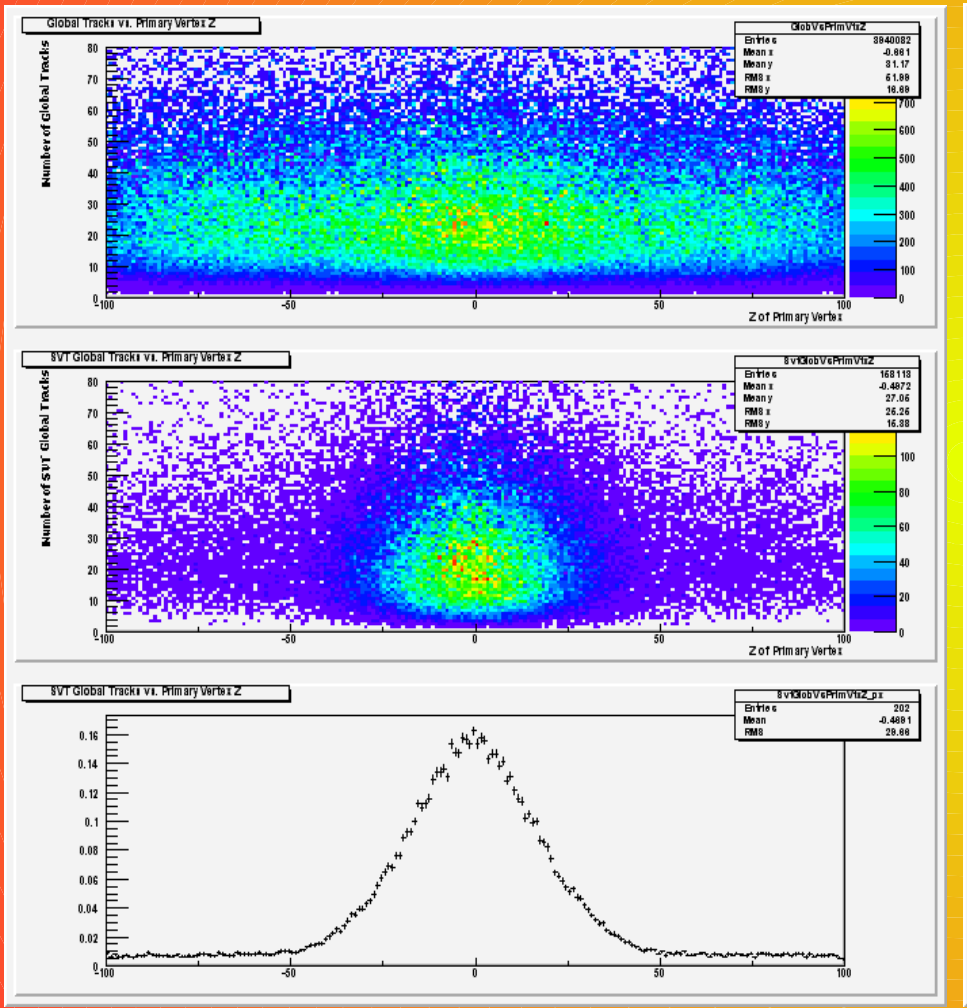


STI Primary Tracks

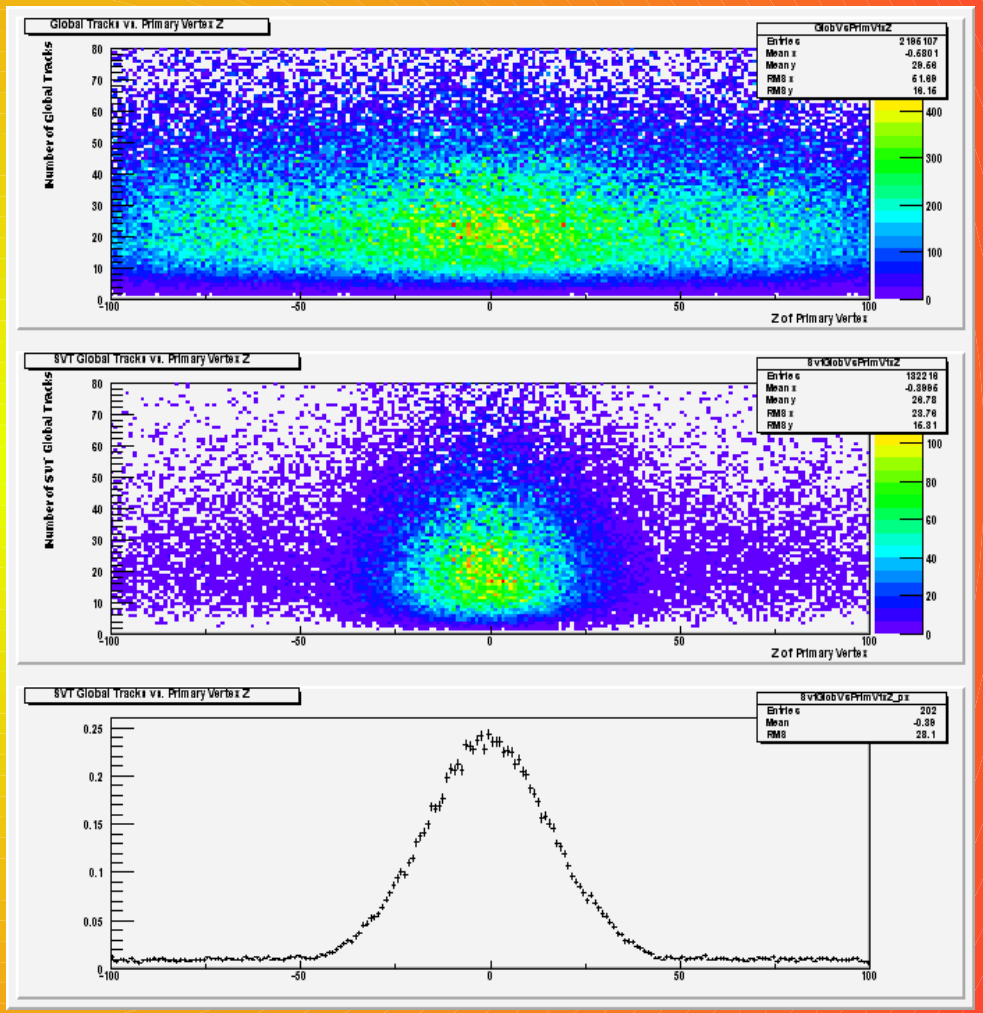


STI Global Matching Efficiency With NFitPoints Cut

STI Global Tracks (No Cut)

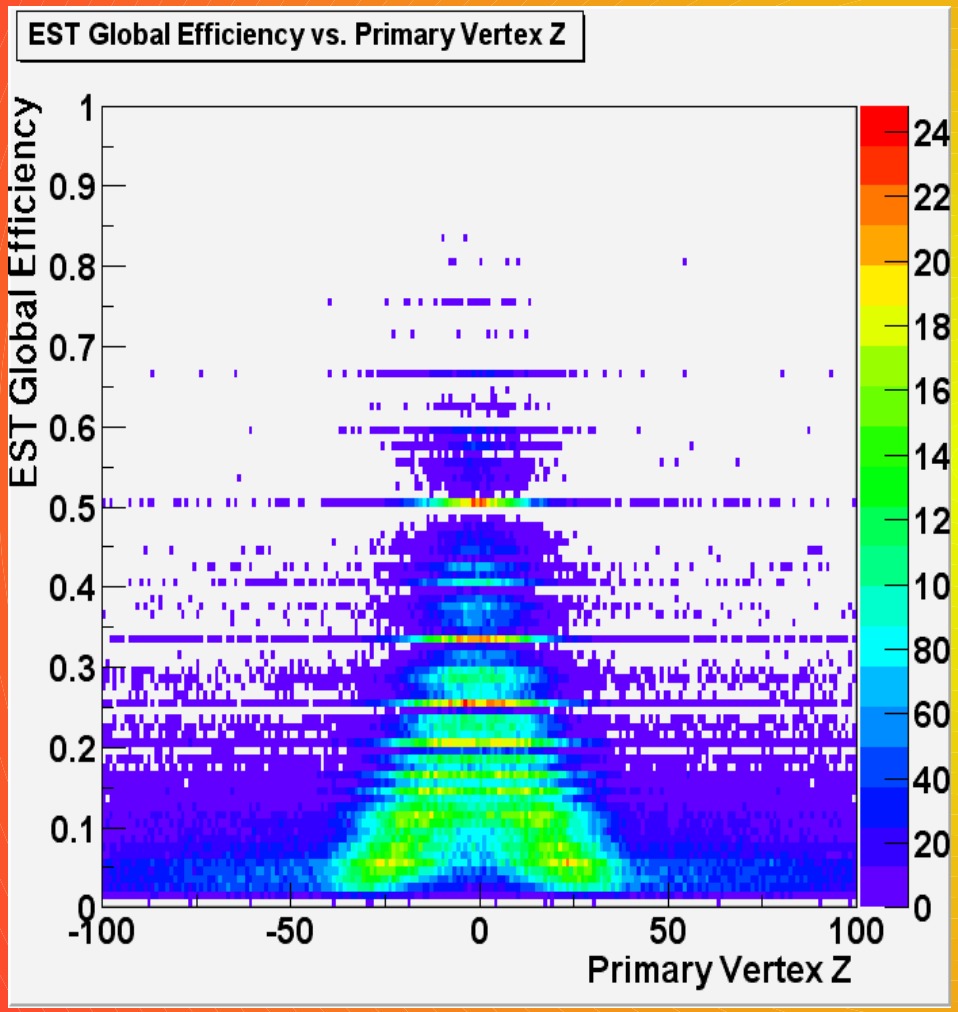


STI Global Tracks (Cut)

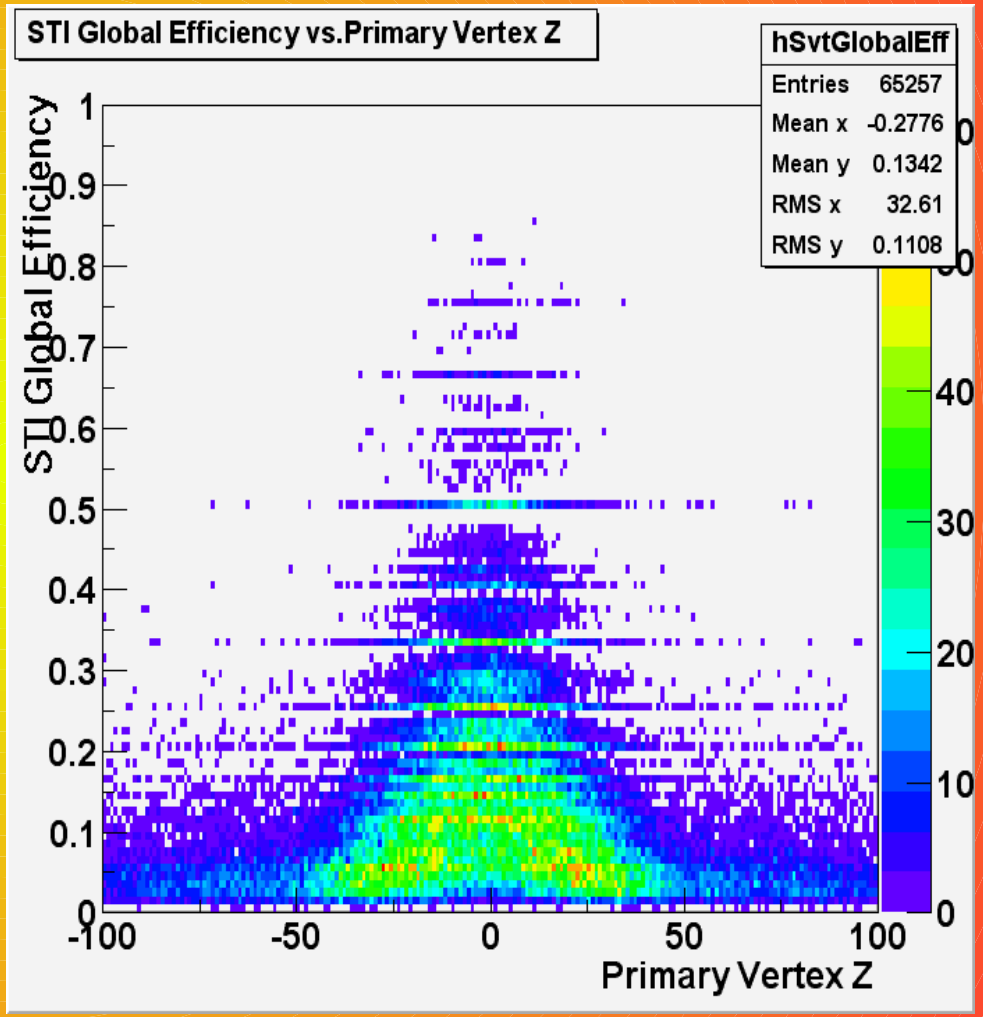


Global Matching Efficiency vs. Primary Vertex Z

EST Globals



STI Globals



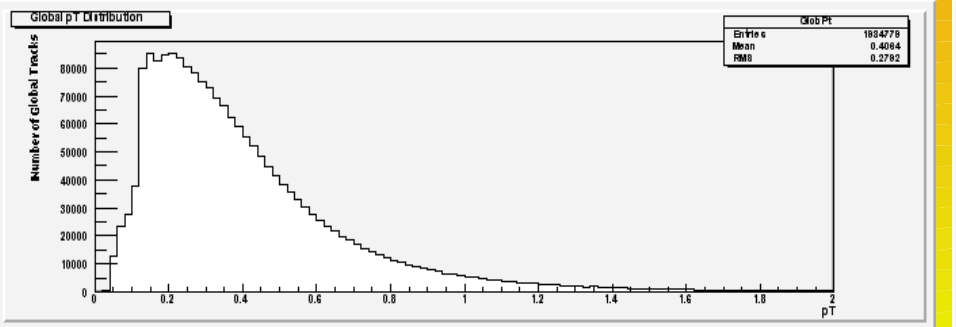
Cut Summary

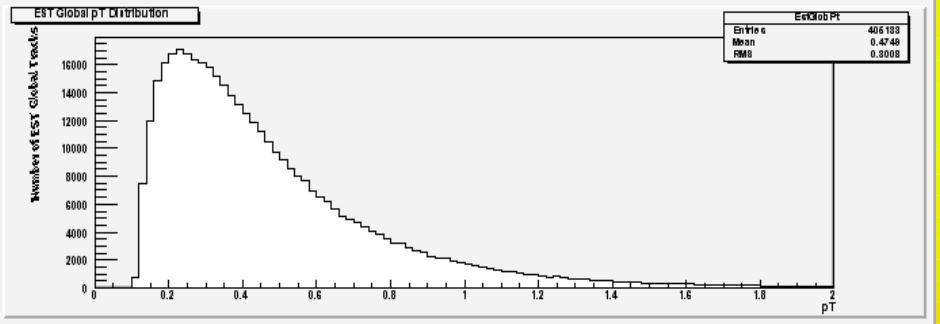
Quality cuts applied to ensure most tracks pass through the SVT

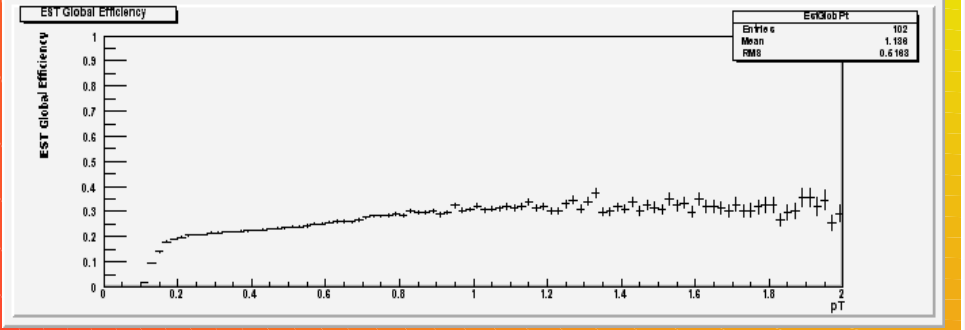
- Require primary vertex |z| < 20cm
- Require primary vertex z != 0
- Require # of fit points > 20
- Standard L0 and track flag cuts

Global Matching Efficiency vs. Transverse Momentum

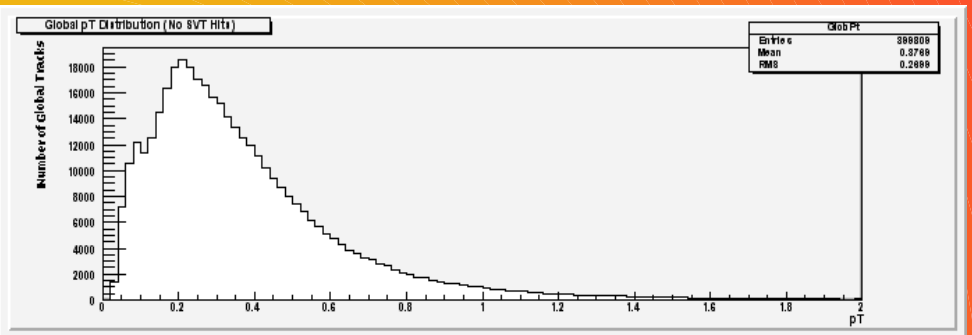
EST Global Tracks

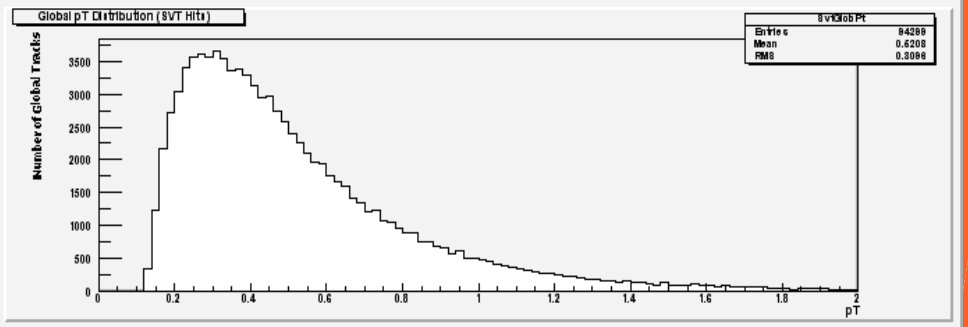


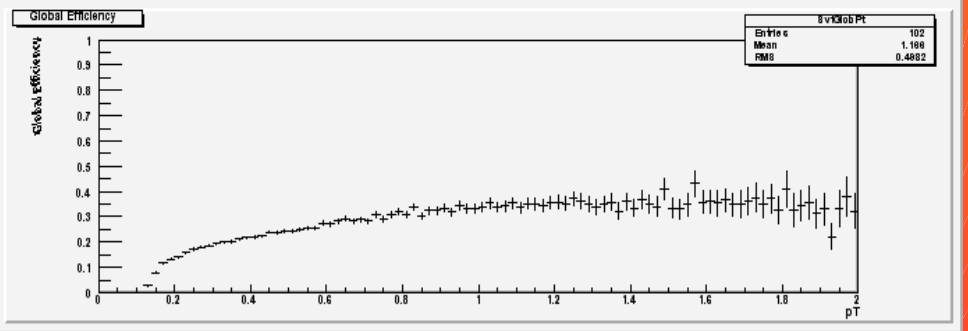




STI Global Tracks

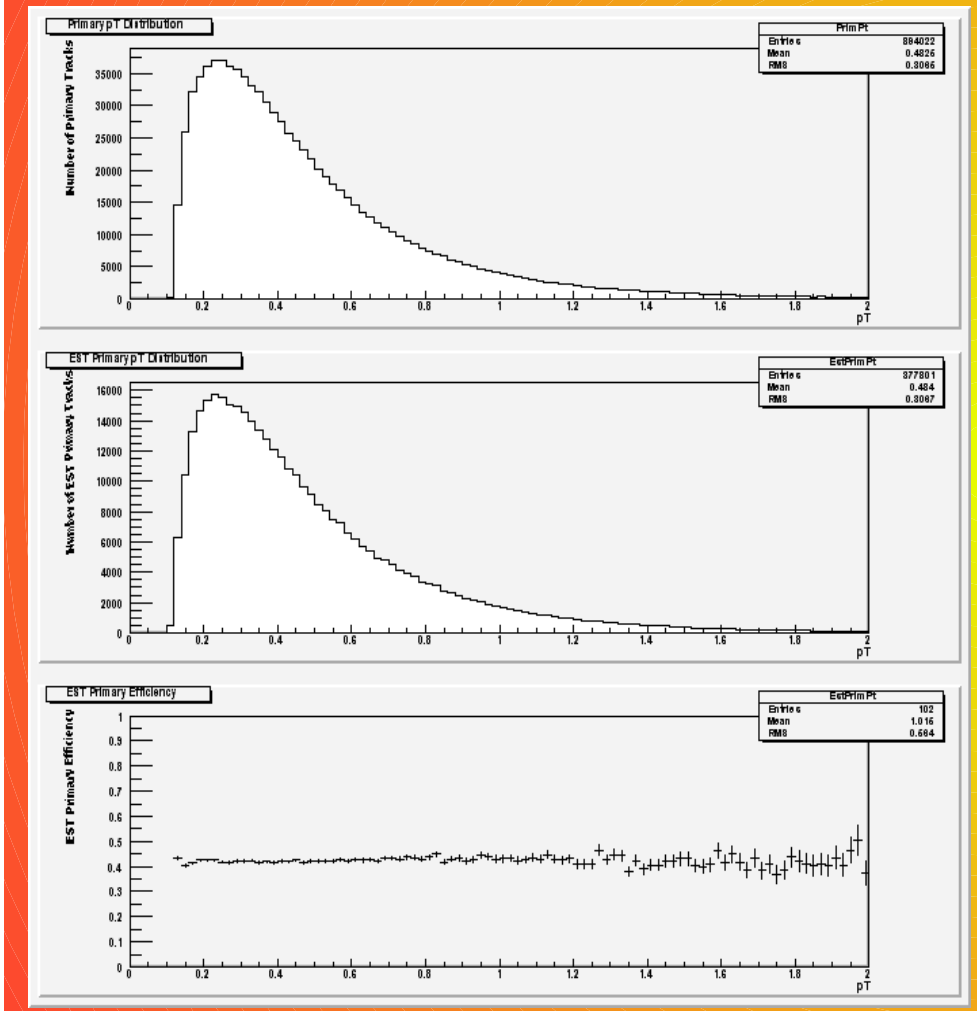




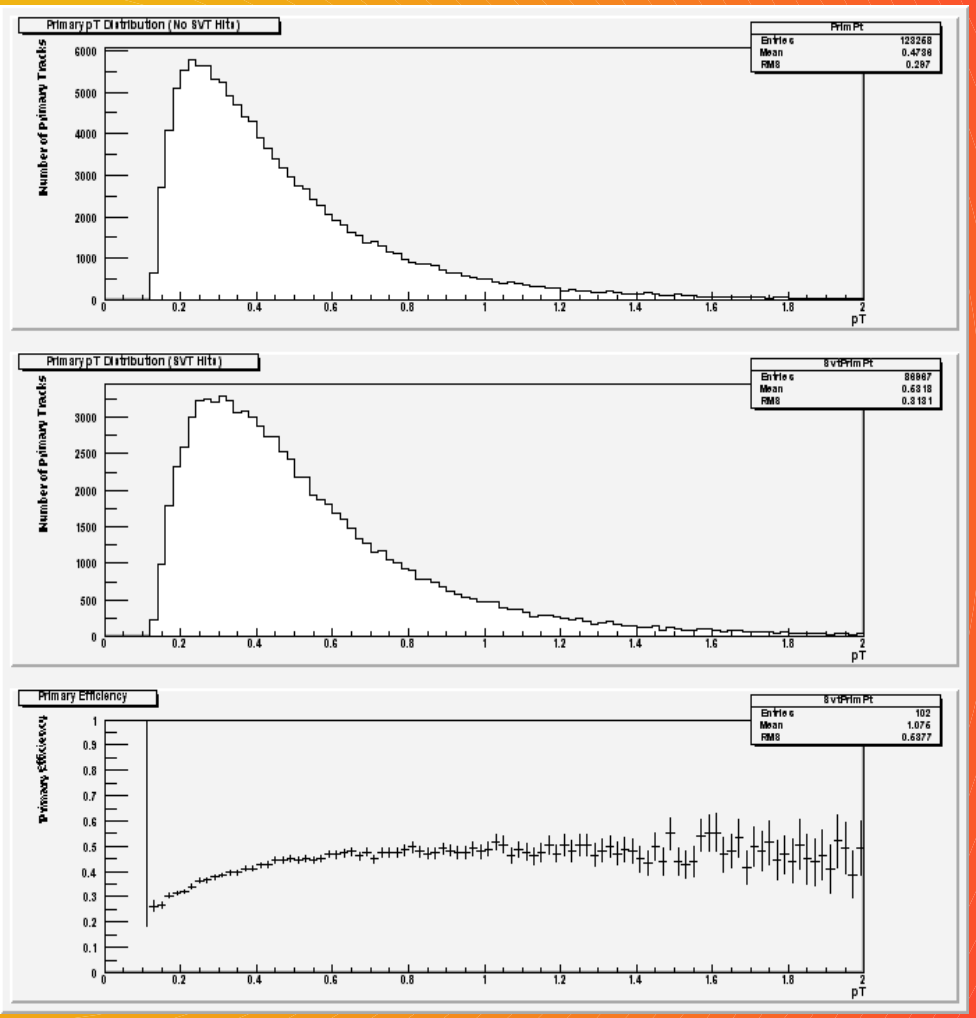


Primary Matching Efficiency vs. Transverse Momentum

EST Primary Tracks

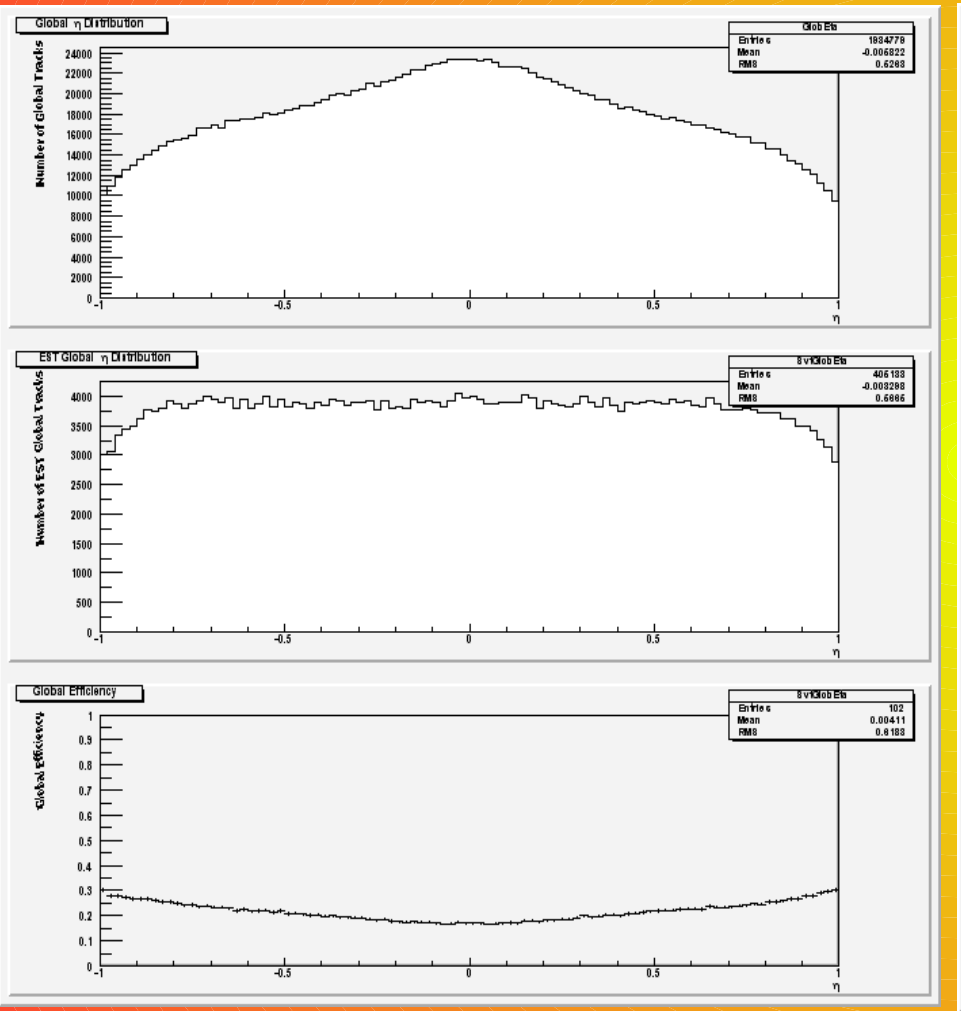


STI Primary Tracks

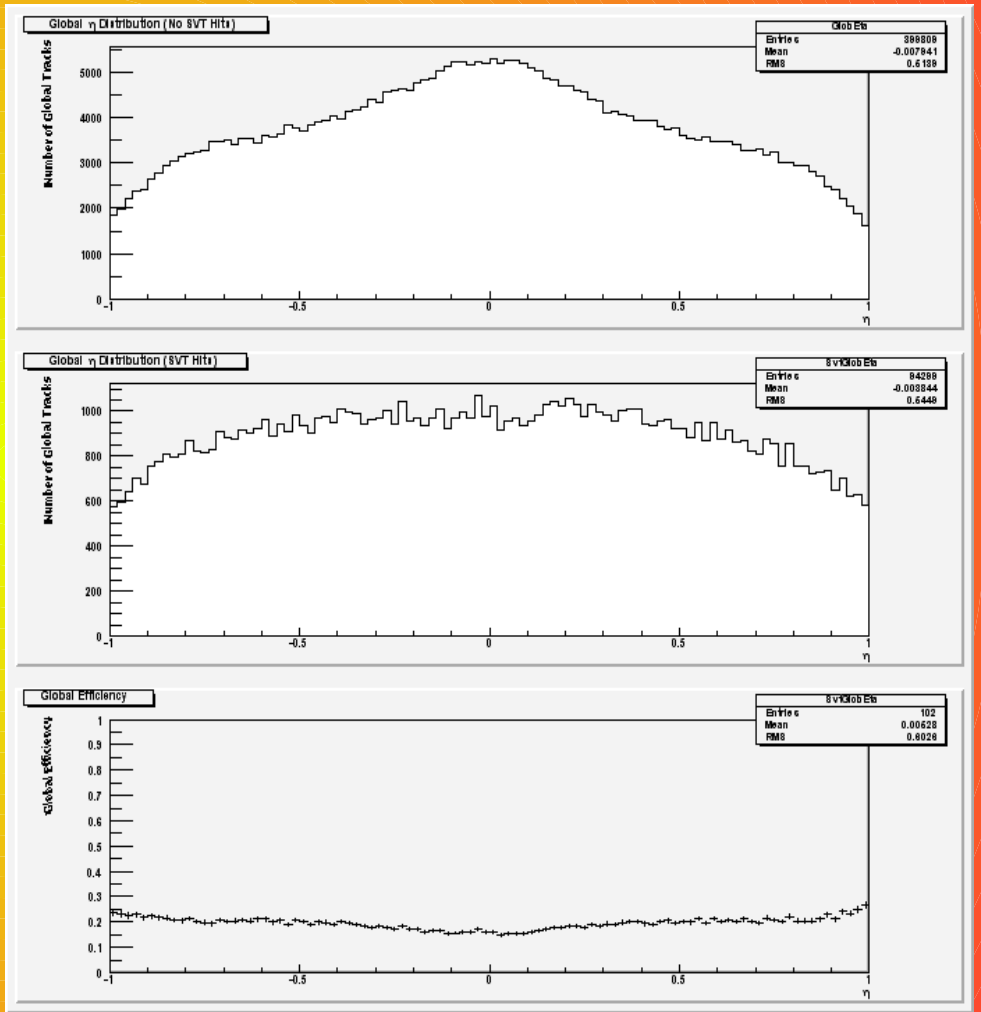


Global Matching Efficiency vs. η

EST Global Tracks

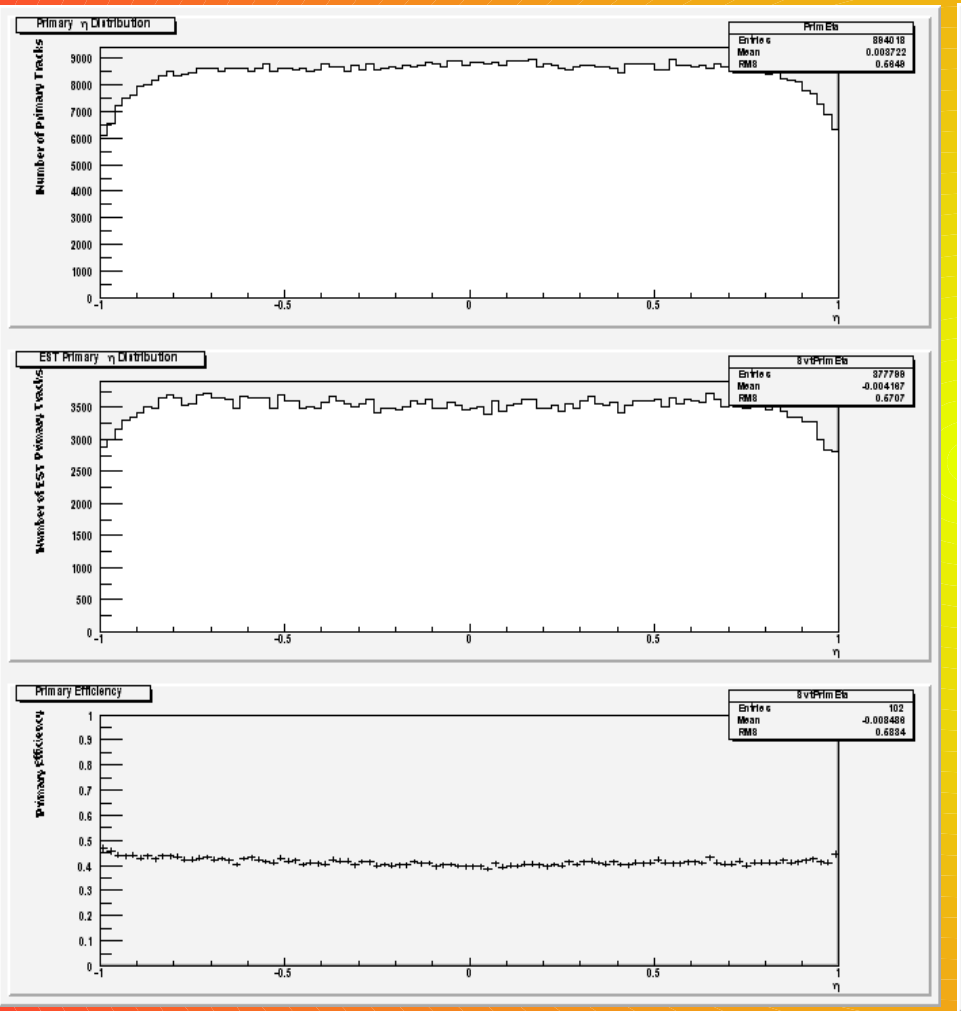


STI Global Tracks

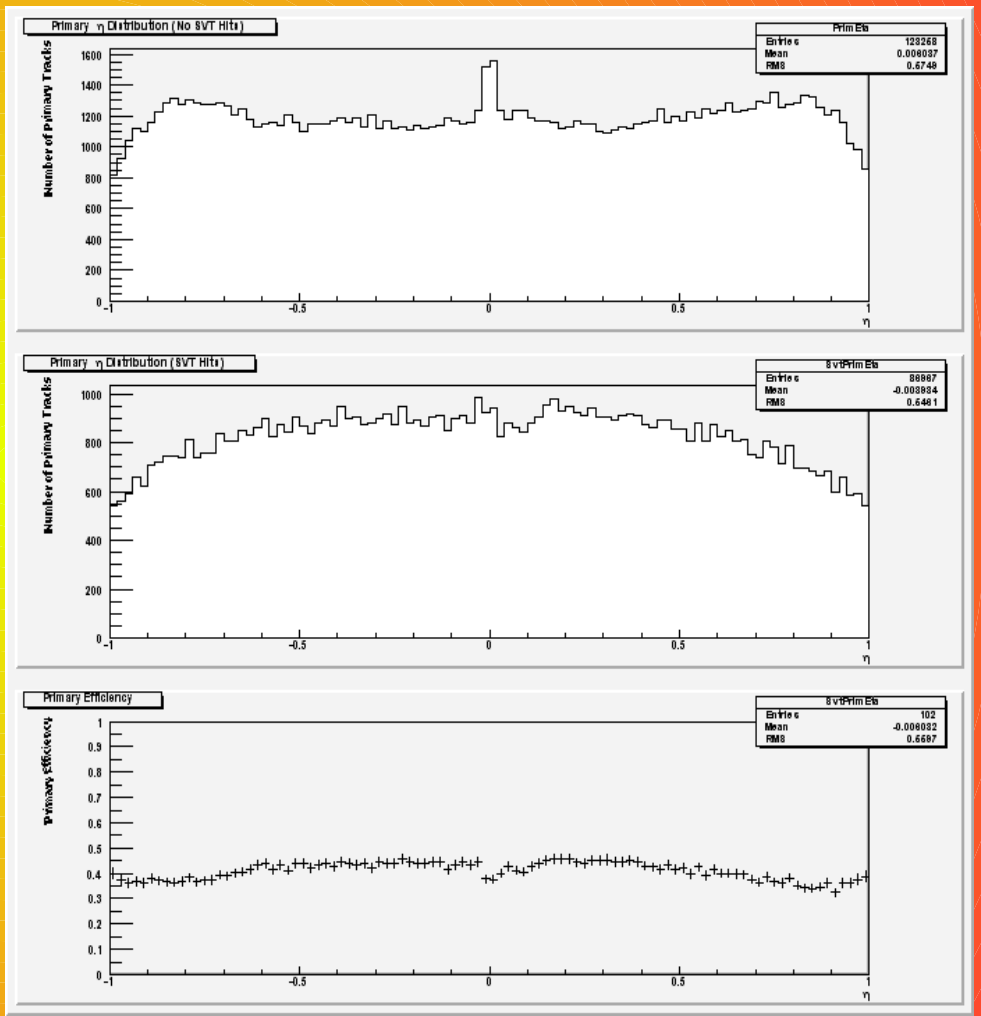


Primary Matching Efficiency vs. η

EST Primary Tracks

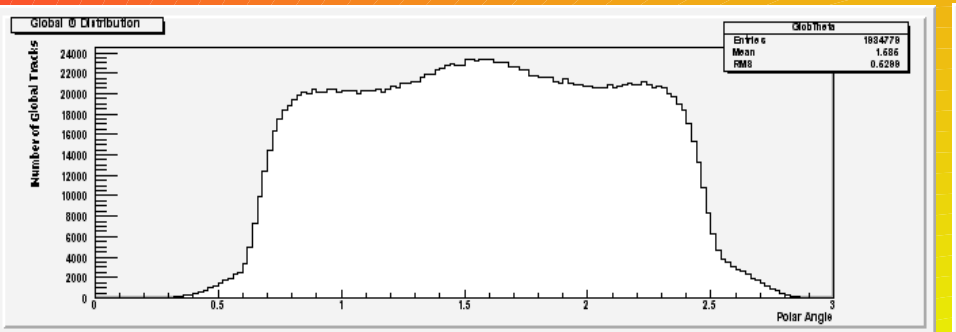


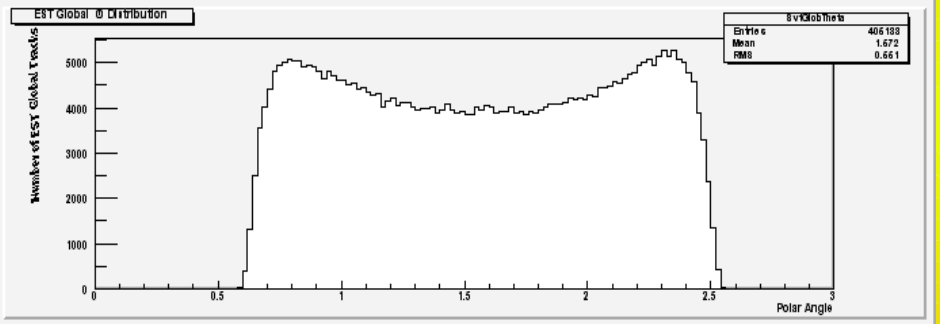
STI Primary Tracks

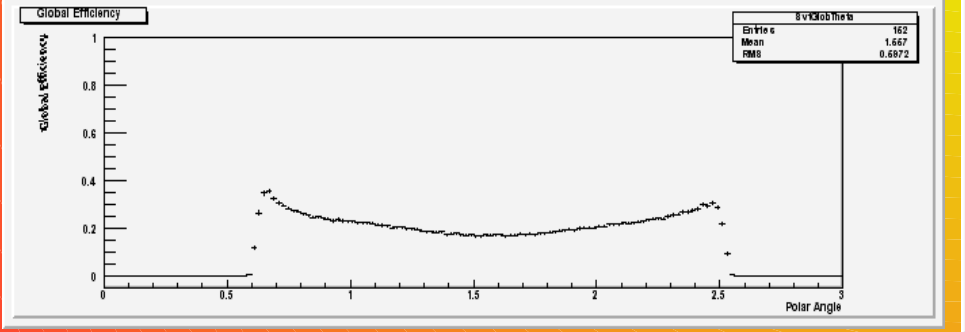


Global Matching Efficiency vs. Polar Angle

EST Global Tracks







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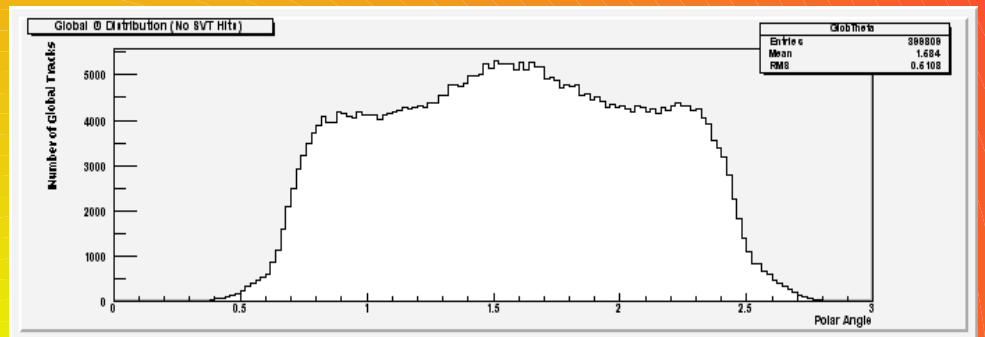
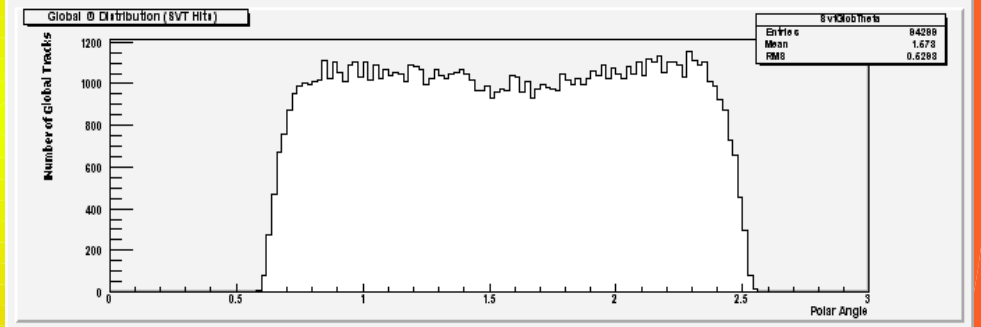
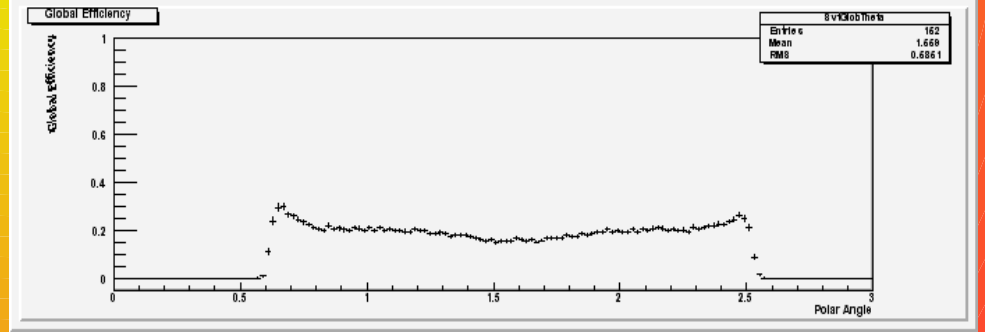
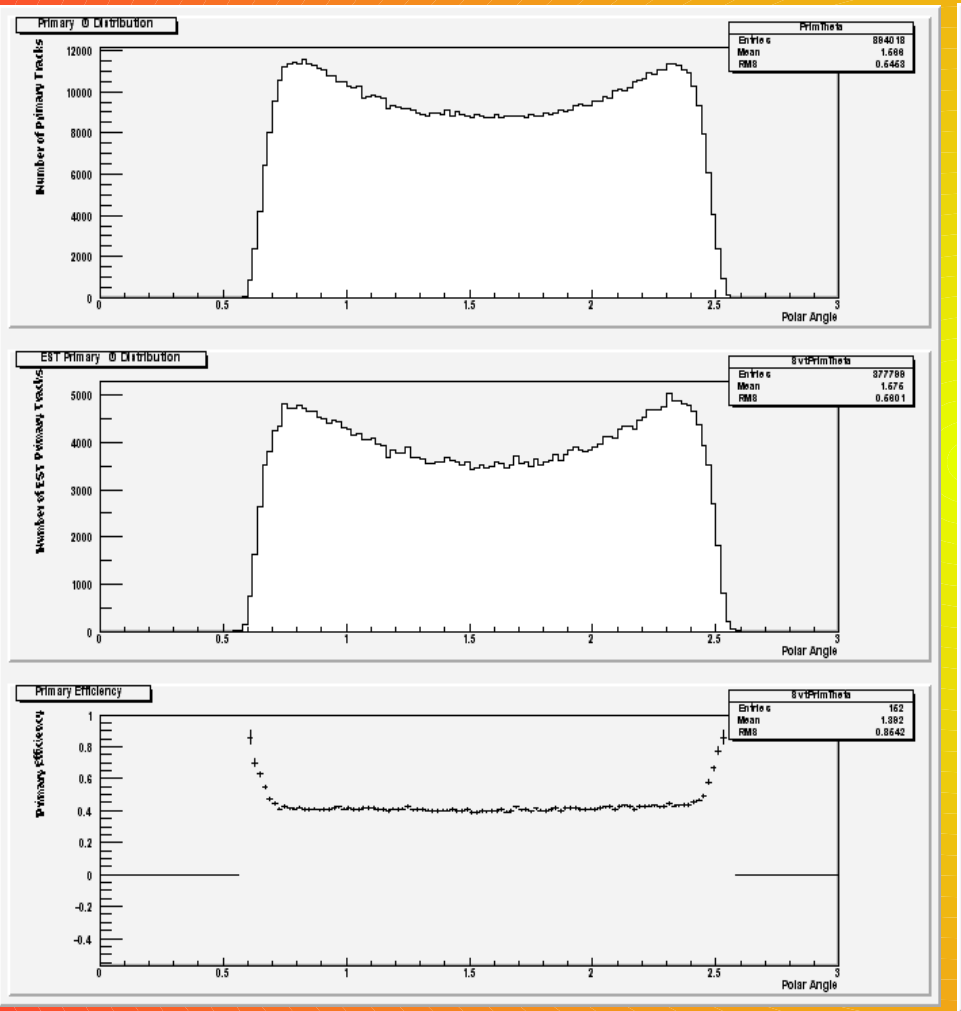




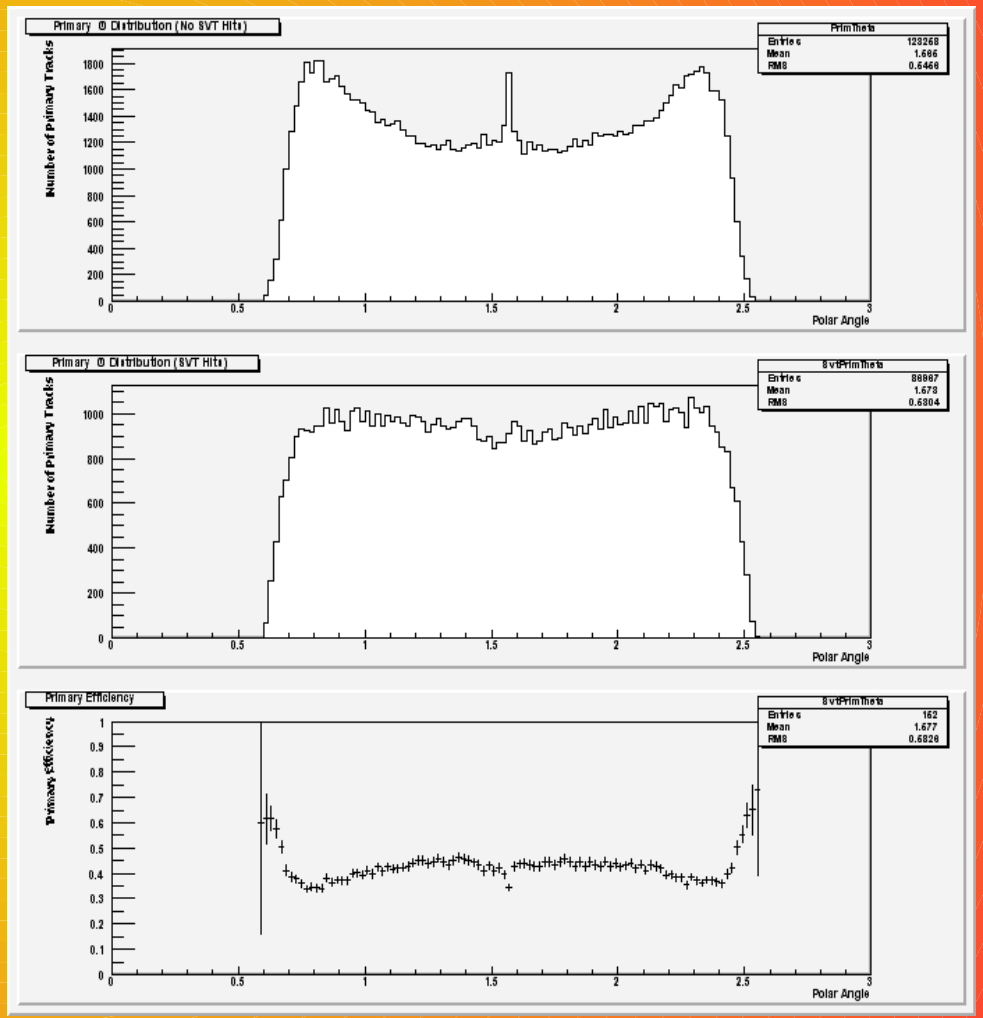


Primary Matching Efficiency vs. Polar Angle

EST Primary Tracks

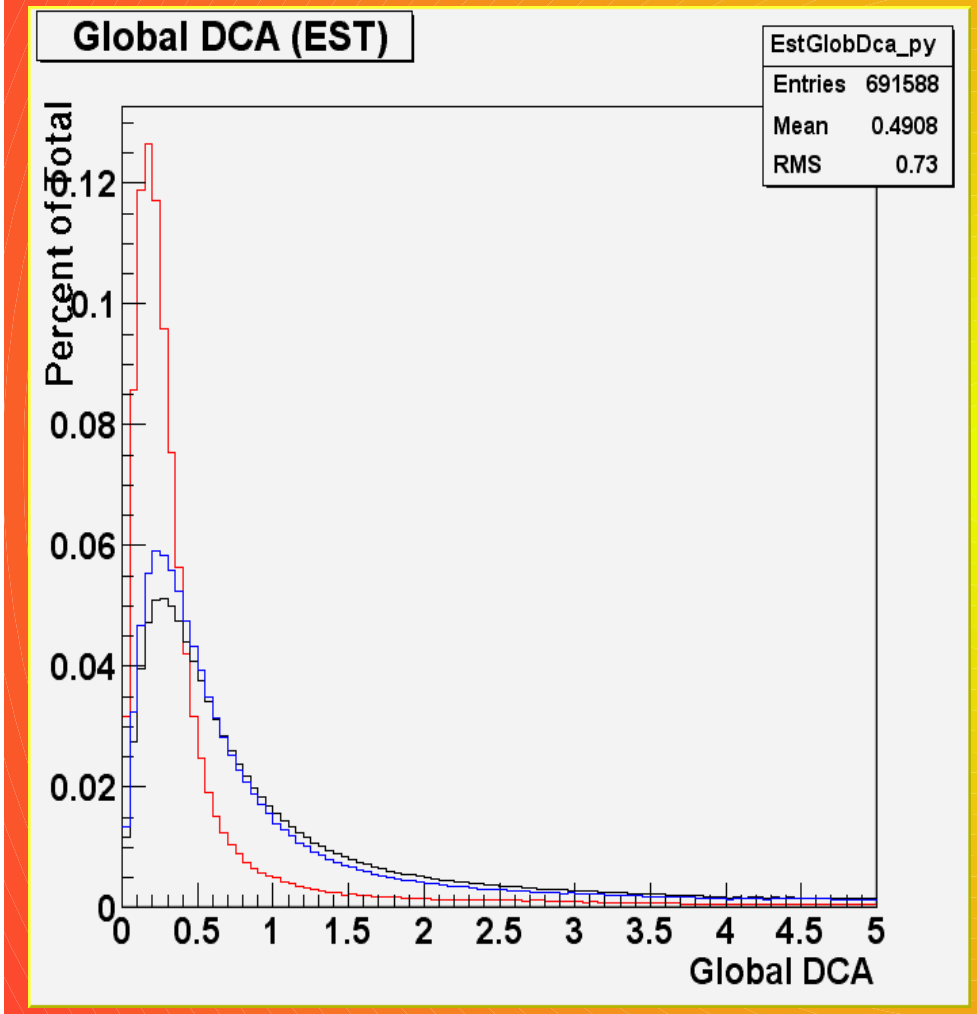


STI Primary Tracks

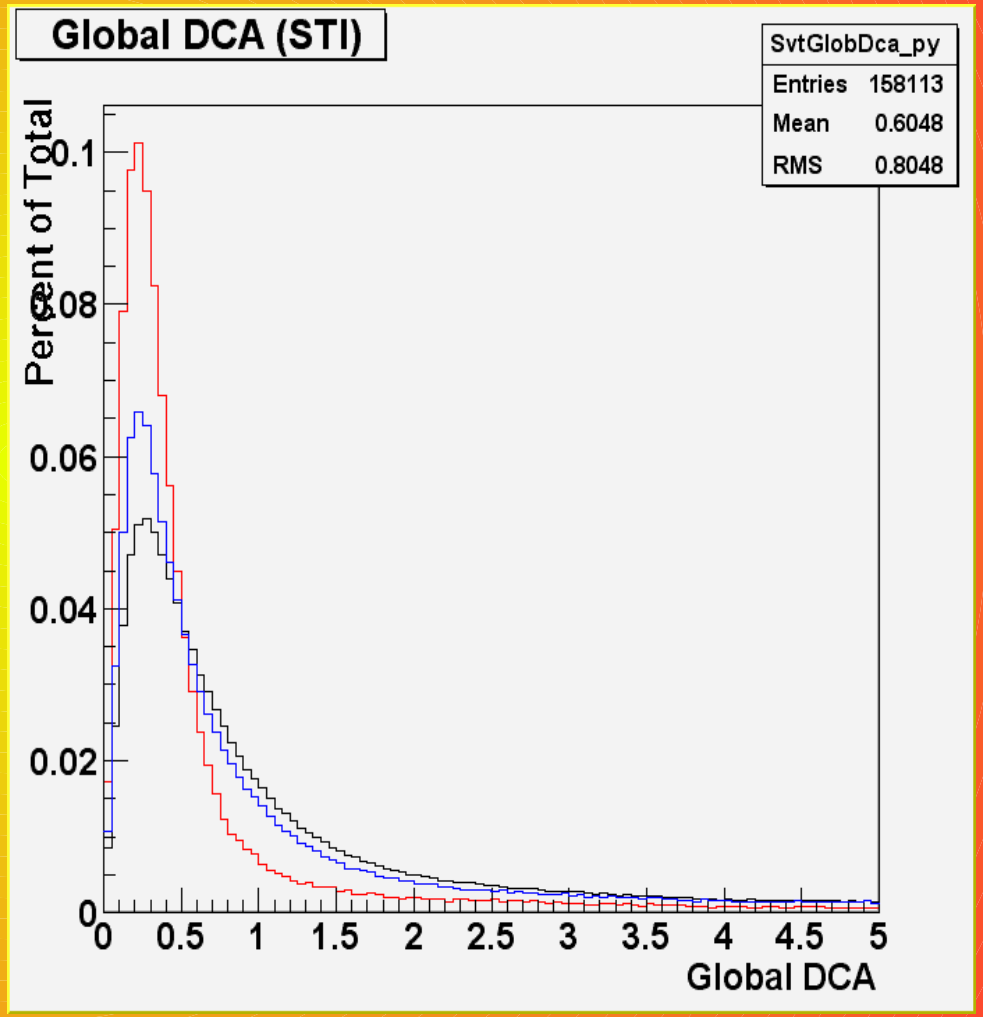


Global DCA Distributions

EST Global DCA

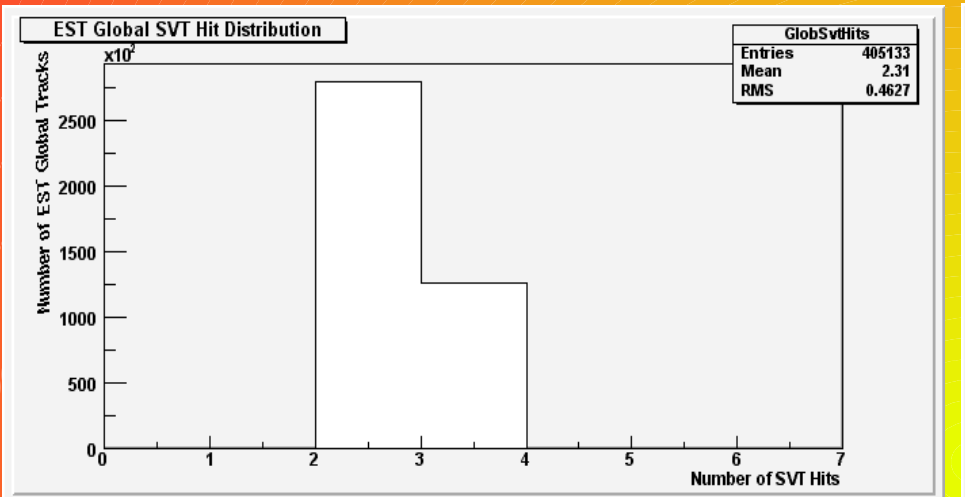


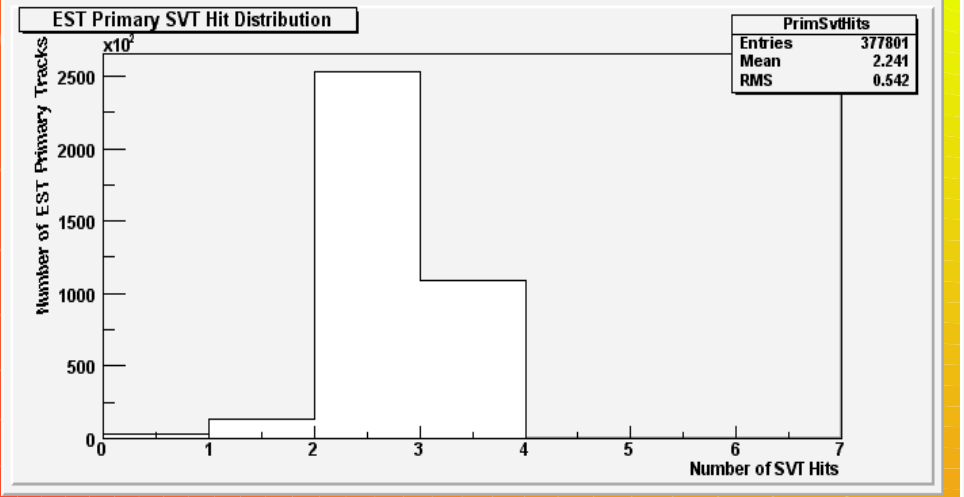
STI Global DCA



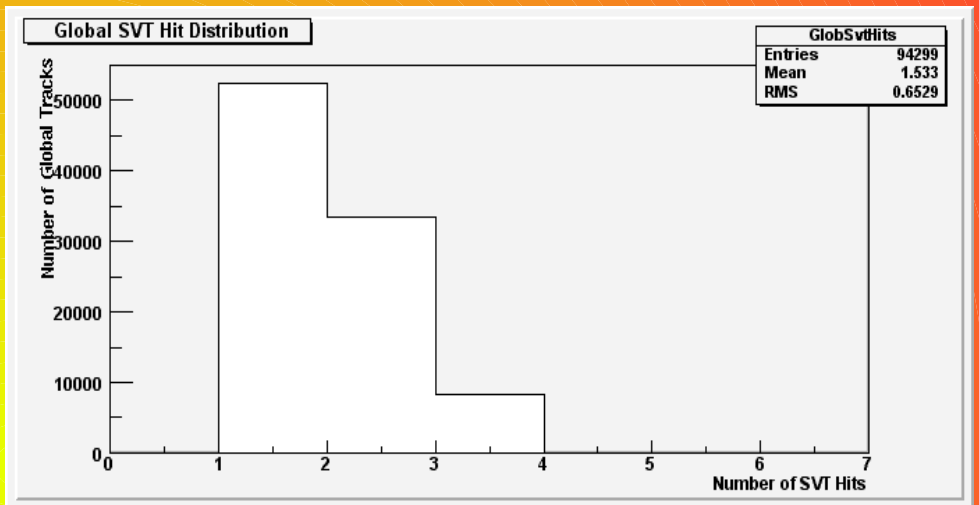
Number Of Associated Hits

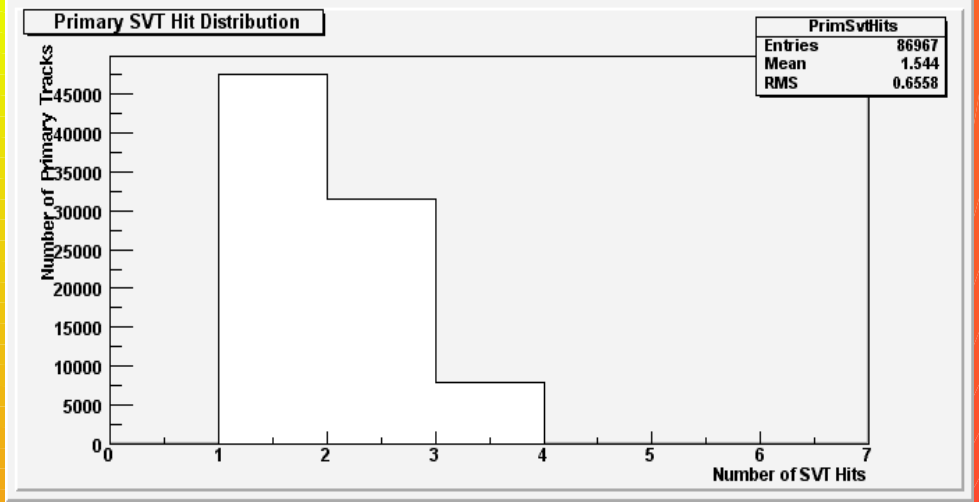
EST





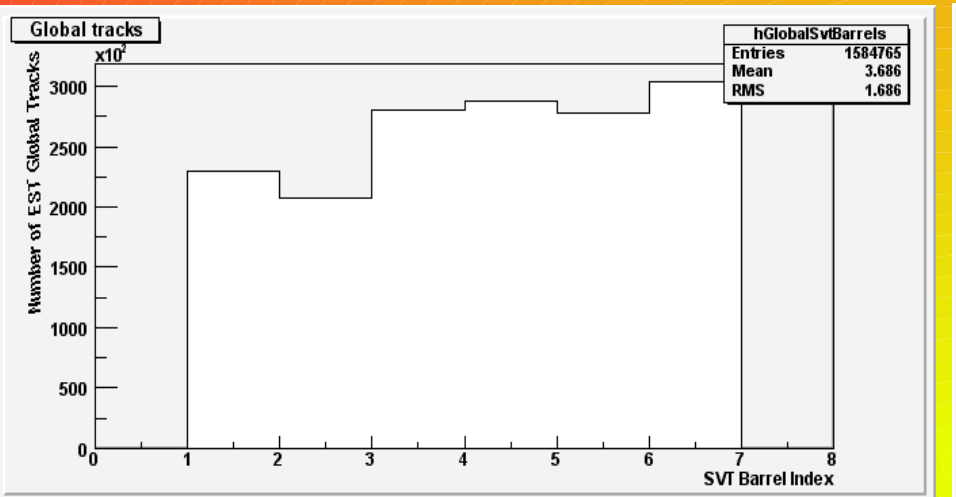
STI

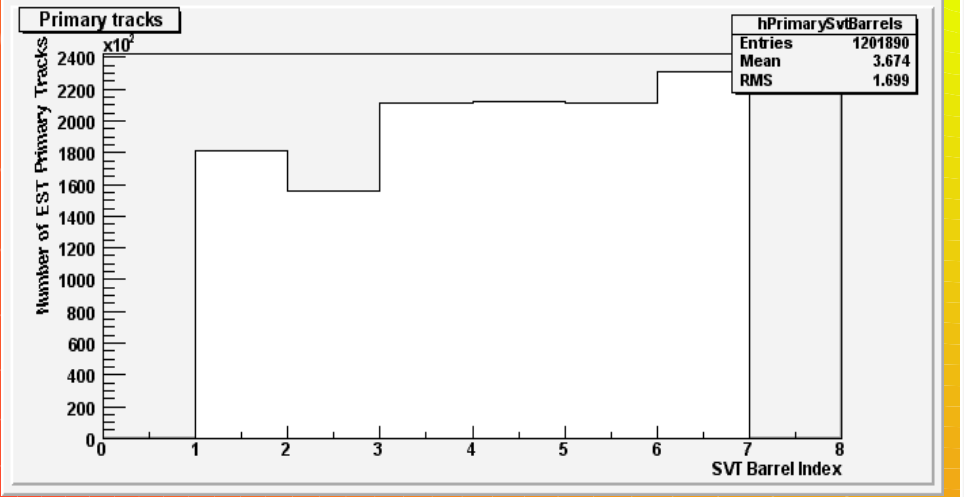




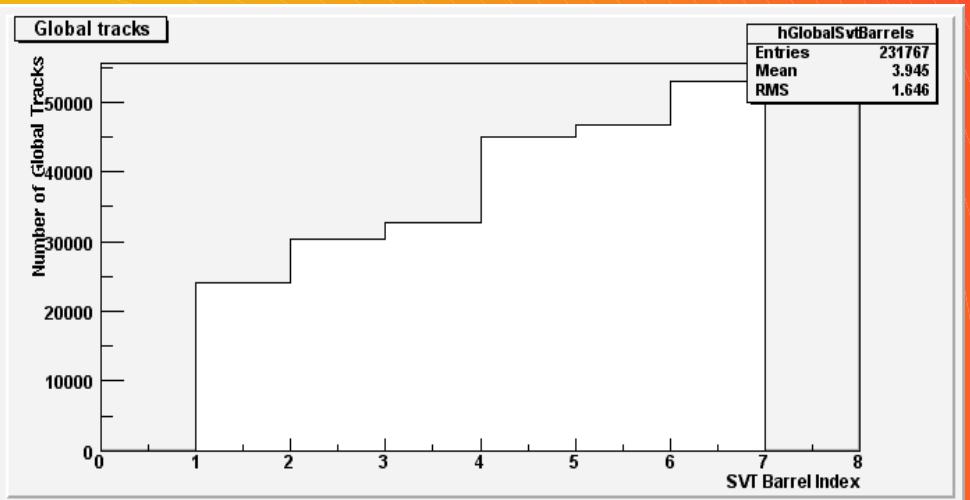
Distributions of Hits on SVT

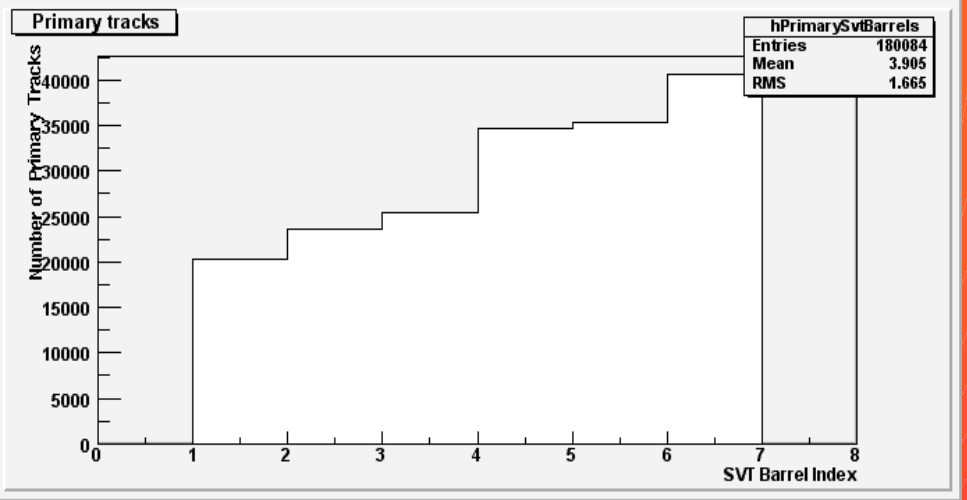
EST





STI





Conclusions & Outlook

- SVT hits are indeed associated with TPT tracks
- No gross differences
- Association performing at least as well as EST
- Understand associated hit distributions
- Understand efficiencies (Monte Carlo)