Event Merge

Todd Huffman, Oxford University
Dongwook Jang, Rutgers University

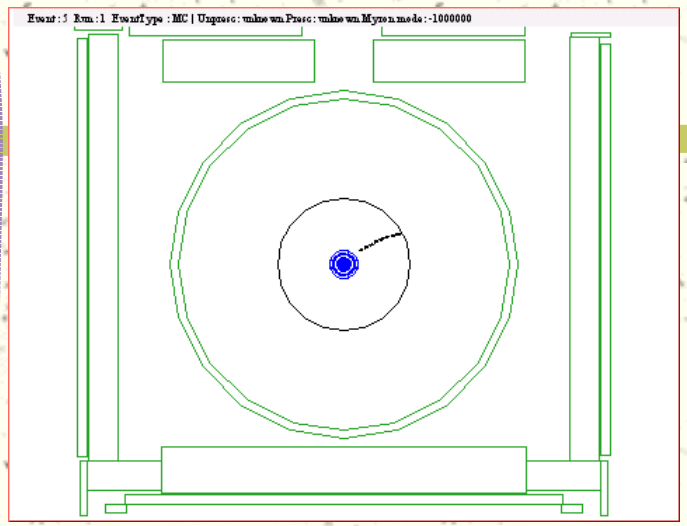
Outline

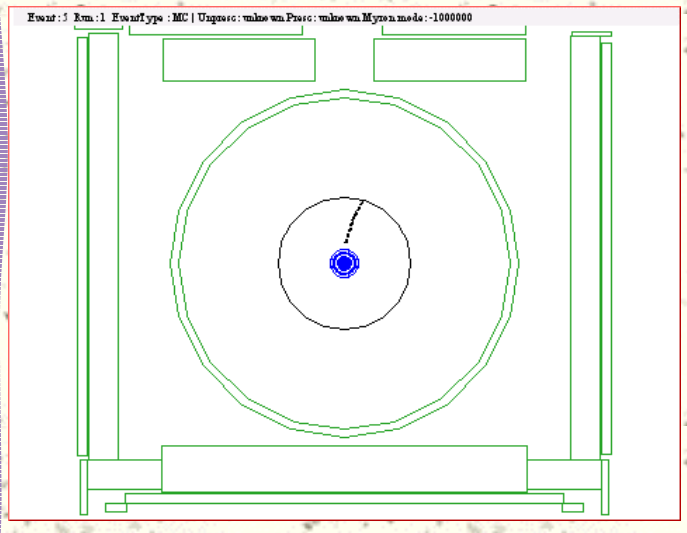
- What is Event Merge
- How does it work
- Status of current version
- First results
- Next steps

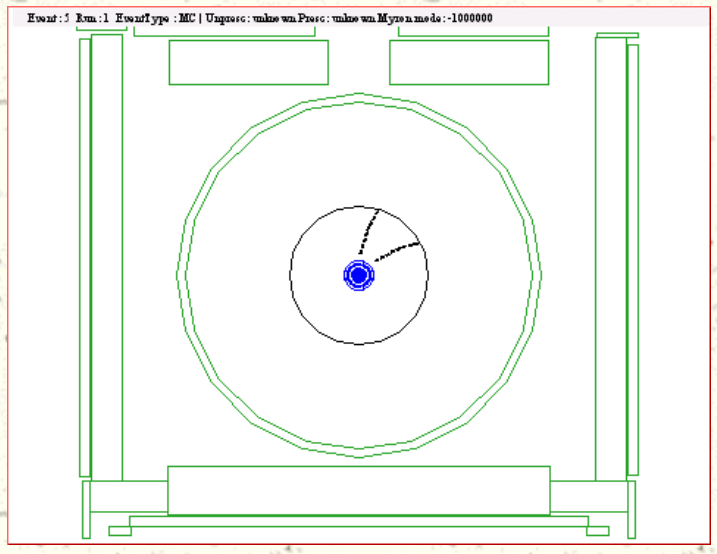
What is Event Merge

- Event Merge is simply to merge two different data into one data.
- Applications!
  - ***Tracking efficiency studies.***
  - ***Luminosity dependant efficiency and trigger studies.***
  - ***Better simulation of real data.***
  - reference : cdf5524

Merged COT Hits







How to merge events

- How to use the EventMergeMods package
  - Build executable

    addpkg –h EventMergeMods

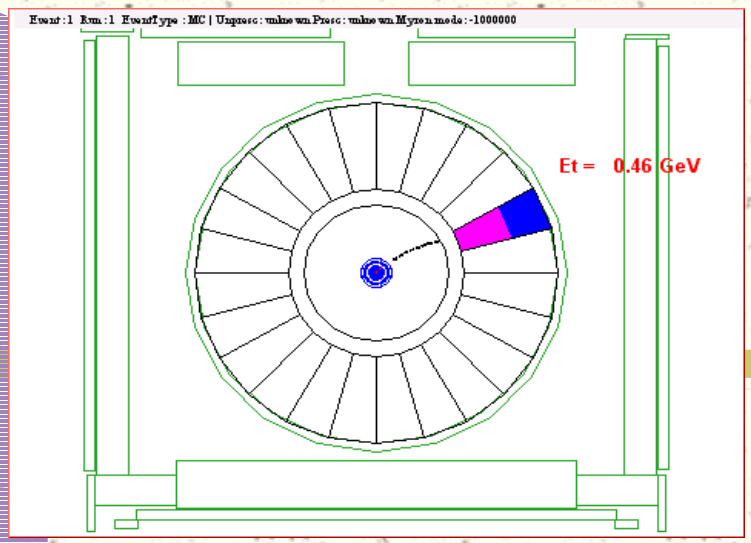
    gmake;gmake tbin on top of the package directory
  - Modify example tcl file in test directory
- Two input files
  - The second data will be interleaved into the first data
  - When interleaved, the method to do that can be a Poisson distribution. However, I checked only one-to-one merging.
- One output file
  - The created merged banks have "Merged" description field
  - The original Banks can be kept.

Status of current version

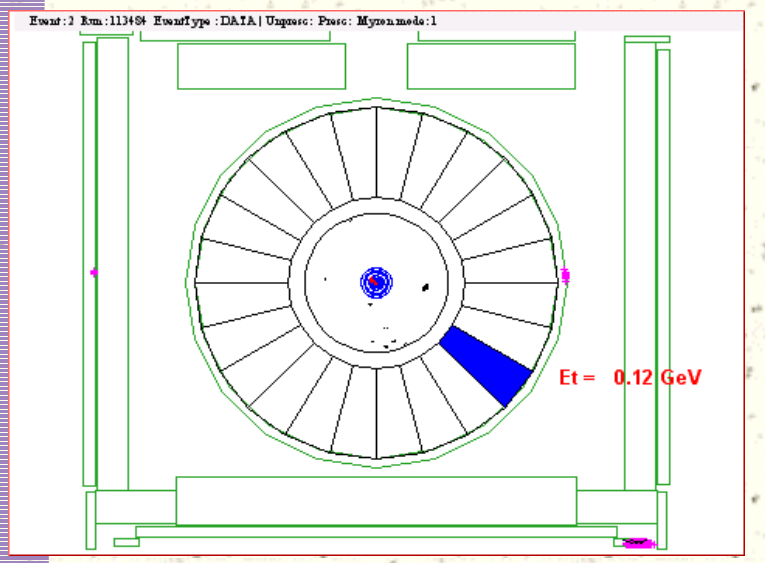
- Works only Banks using TDC (COTD, CMUD, CMXD, CMPD)
- Work in progress for other part of detector
  - Silicon merging (Rick Snider)
  - Calorimeter merging (Todd Huffman)

First results

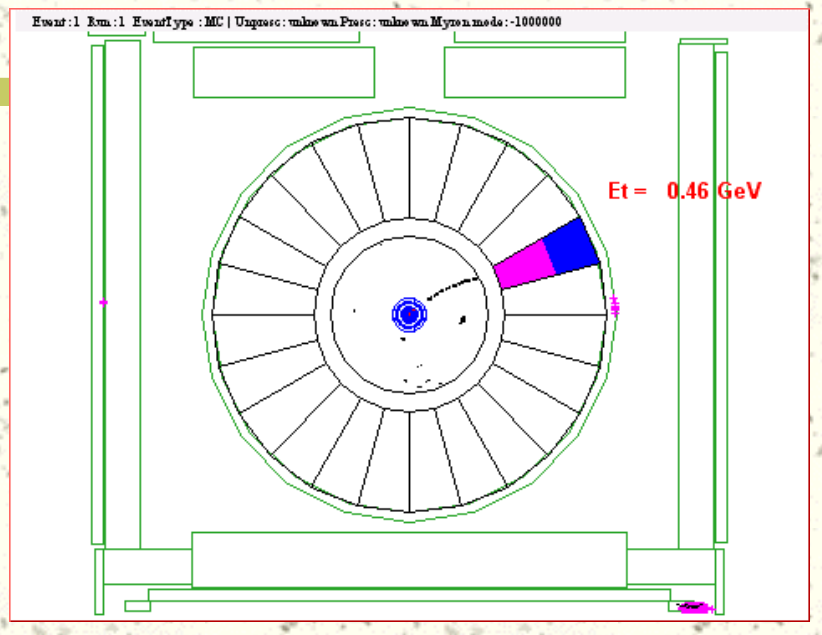
- Data samples
  - ***Primary input data :***
    500 fake single pions generated by cdfSim
    Eta = 0.1, phi = 45, Pt = 0.1 to 5.0GeV
  - ***Secondary input data :***
    500 minbias events, run# 113484 36X36
- Merged minbias data onto MC, then ran the production(3.16.0)
- Count tracks in the region
  - ***0.0 < eta < 0.2 and 40 < phi < 50***



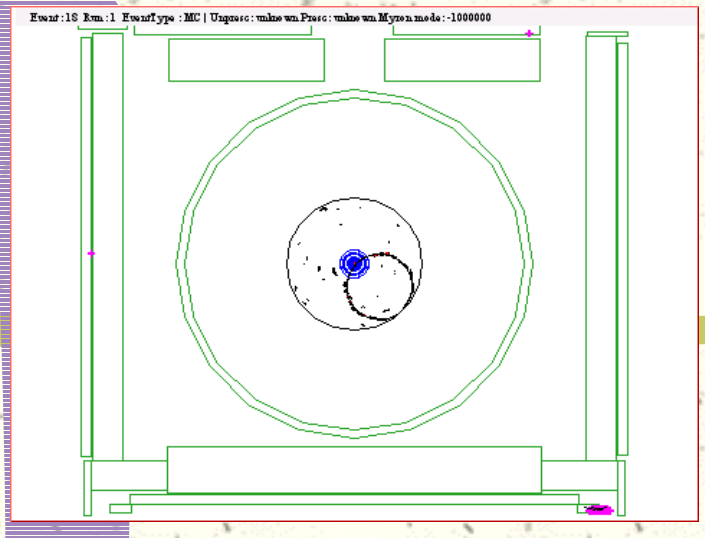
Single fake pion



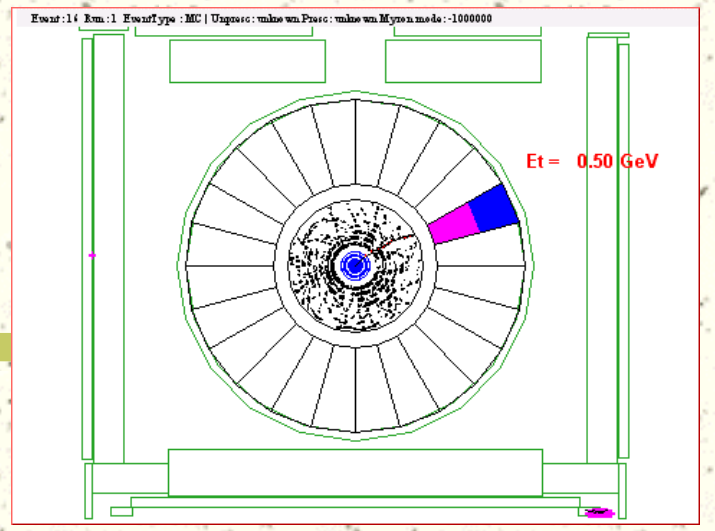
Minbias data



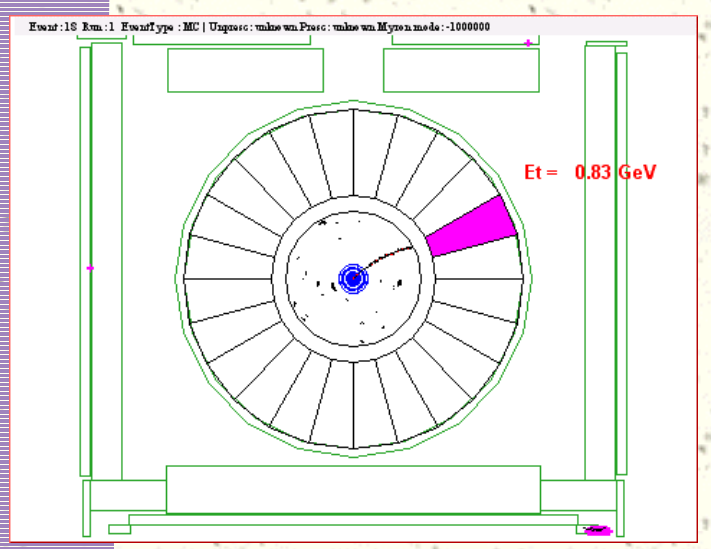
Merged data



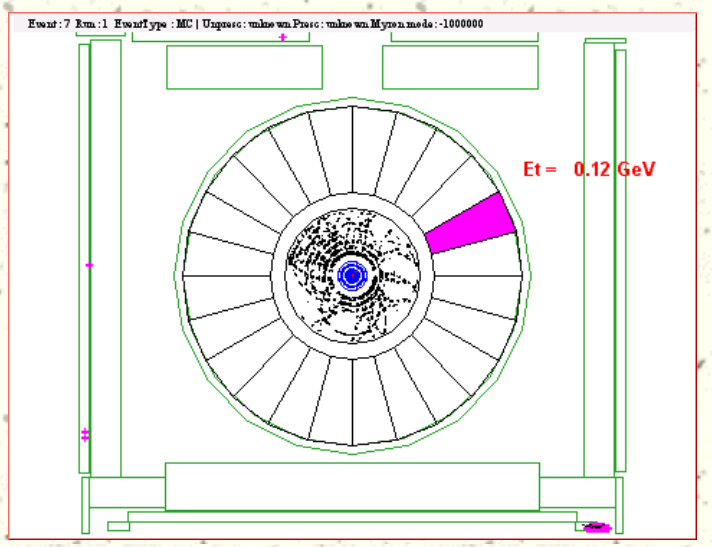
0.3GeV isolated track



Found track

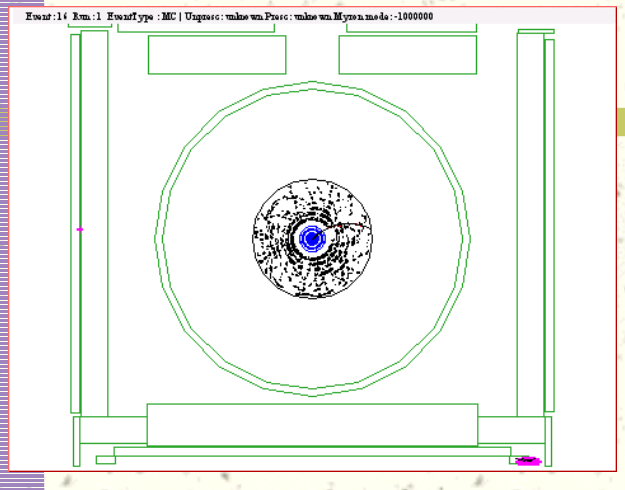


1.0GeV isolated track

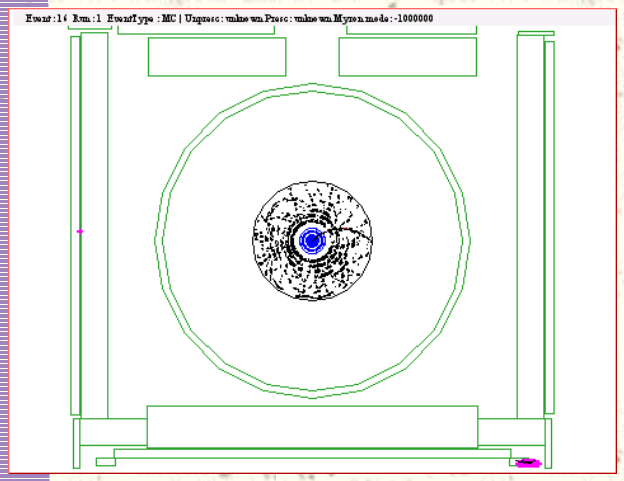


Missing Track

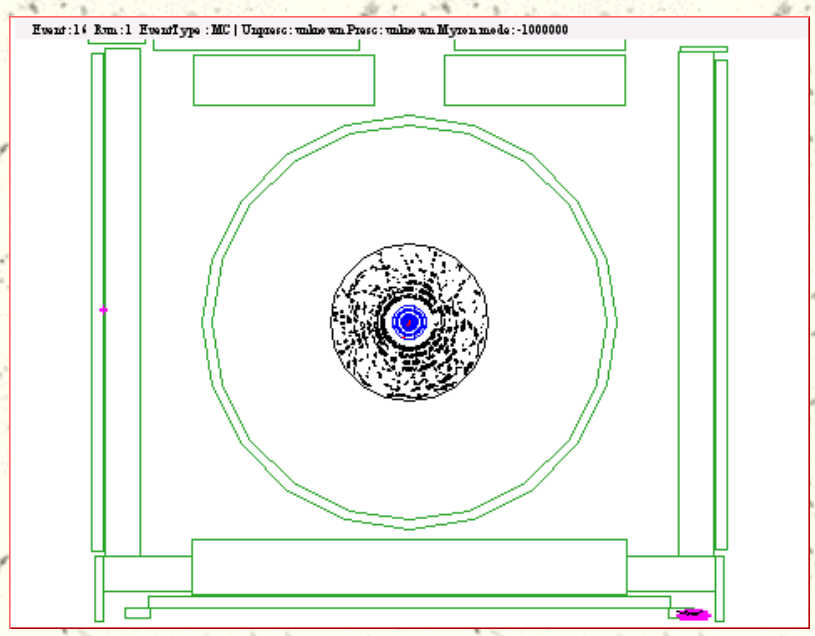
Missed in low momentum



0.5GeV

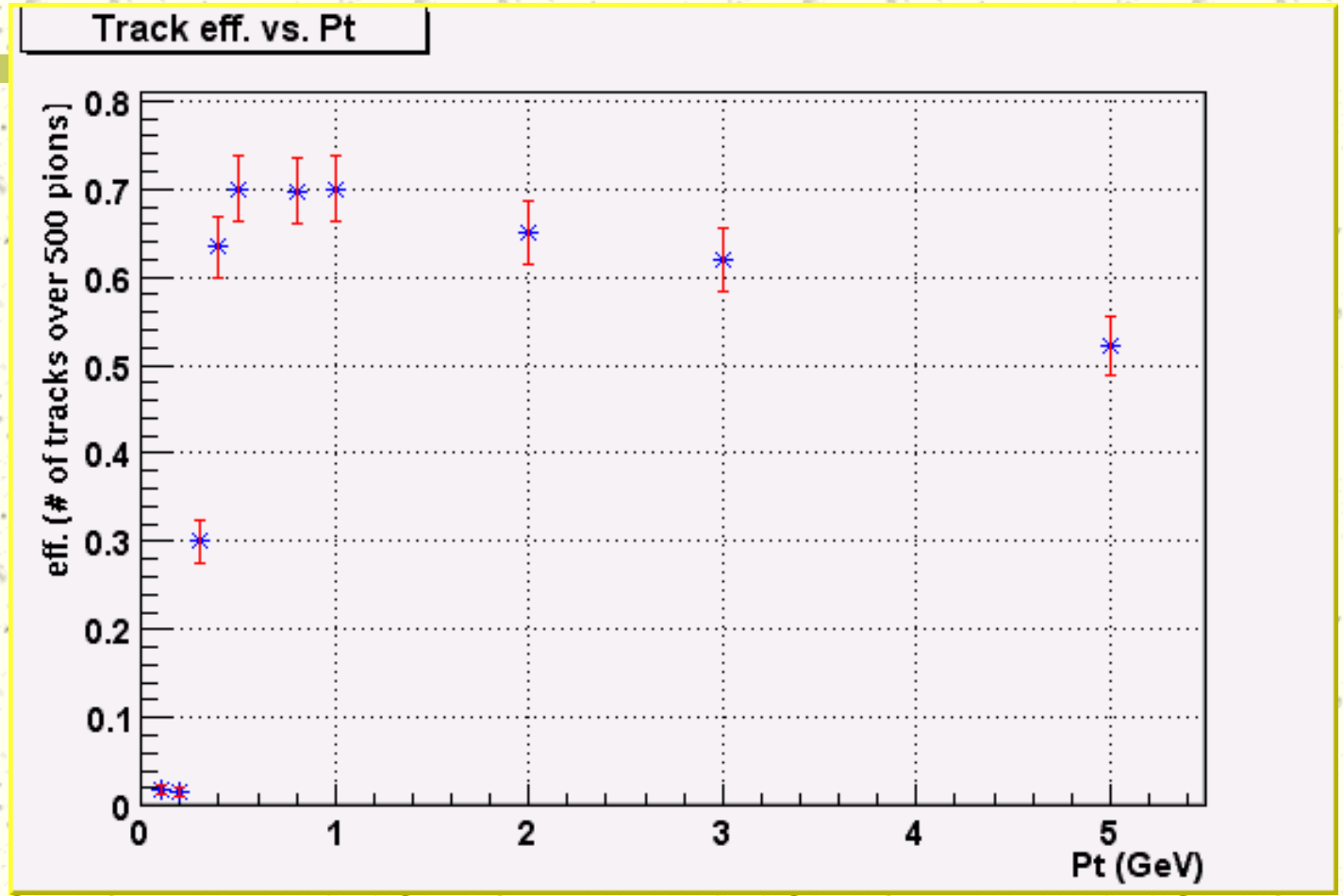


0.4GeV

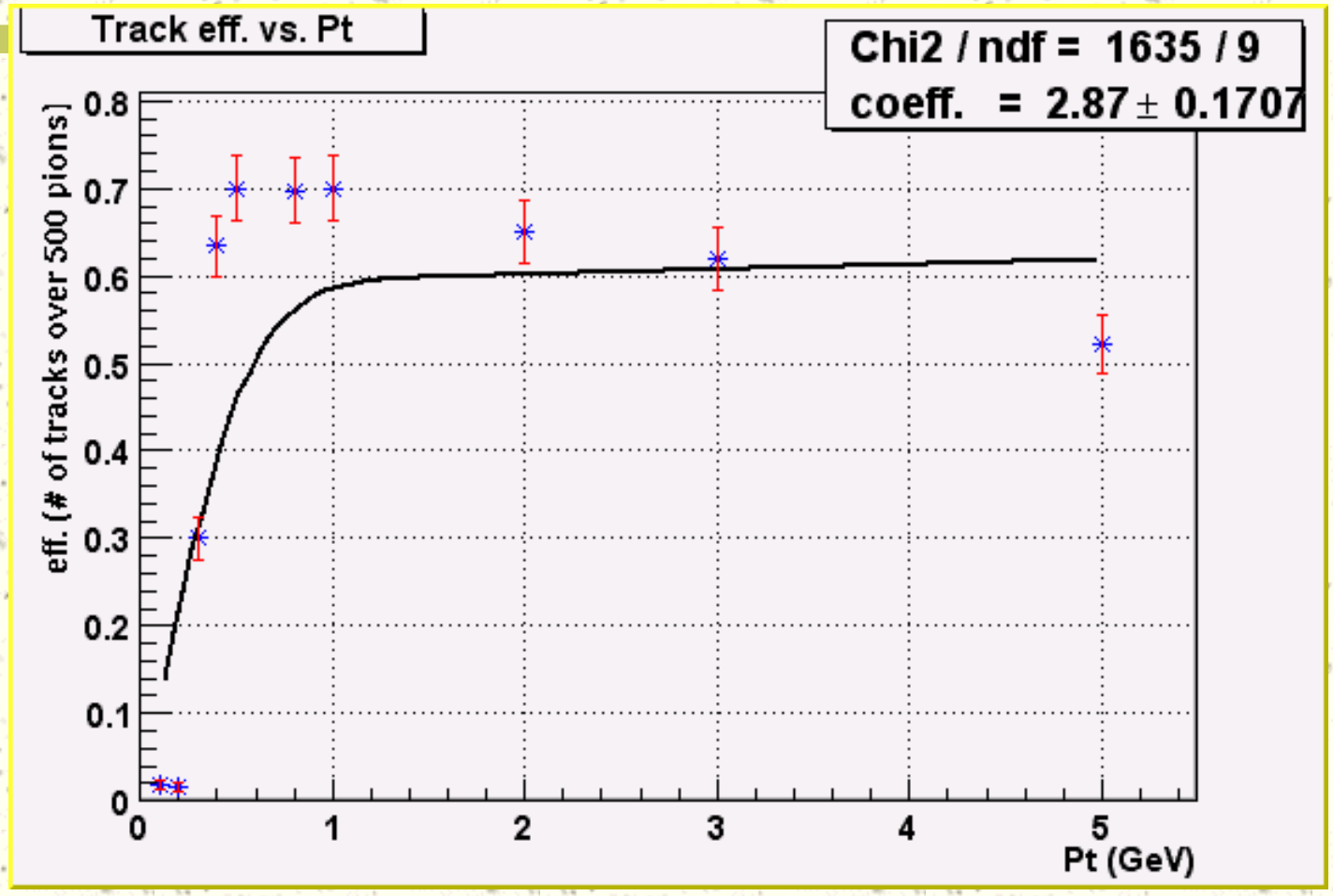


0.3GeV : missed

efficiency


Track eff. vs. Pt
eff. (# of tracks over 500 pions)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
1
2
3
4
5
Pt (GeV)

efficiency2



Next Steps

- Understand why the eff.'s going down in high momentum range
- Expand this study to silicon