Update On Kaon Search

Nick Graf
MIPP Software Meeting
September 28,2005

Data Selection

Data Used

- Run 15875
- Beryllium at 120 GeV
- 8 subruns
- 41644 events

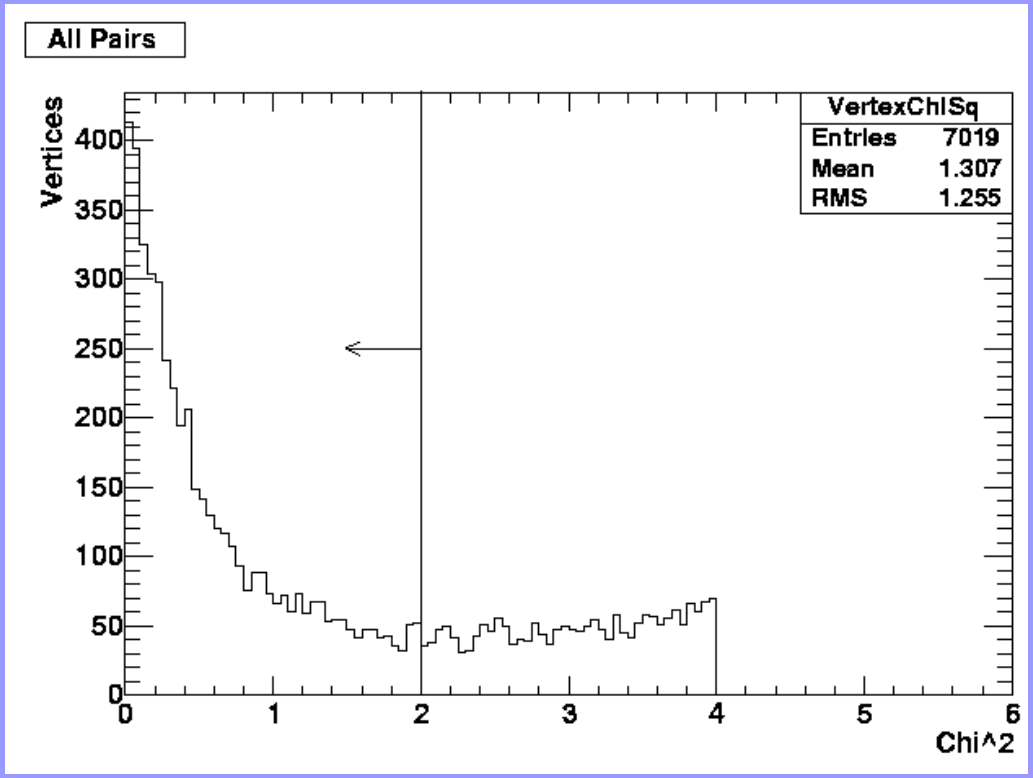
Event Selection

- Run TPC track/vertex reconstruction
- Select two track vertices

Quality Cuts

Track Quality

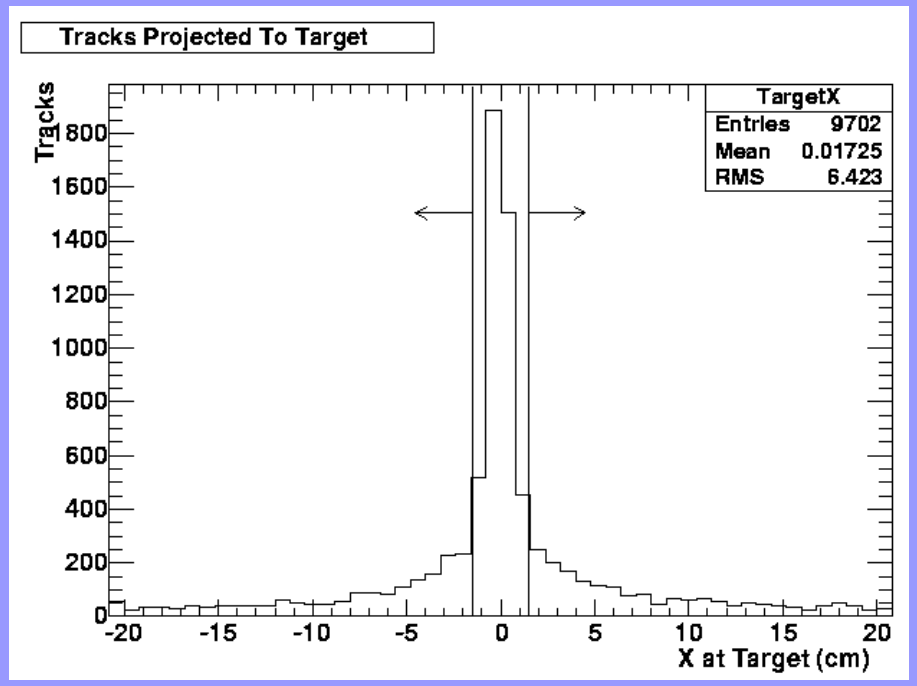
- Curvature greater than 10^{-4} cm^{-1}
- ^{2}/hits < 2



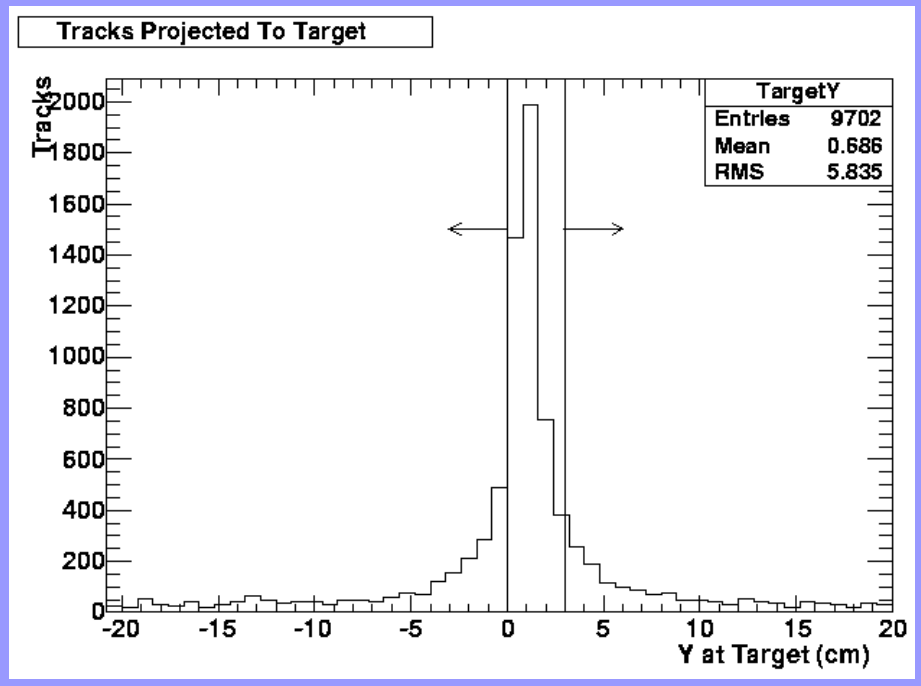
Vertex Quality

- Vertex must be inside TPC
- Vertex $^{2} < 2$

Project Tracks To Target



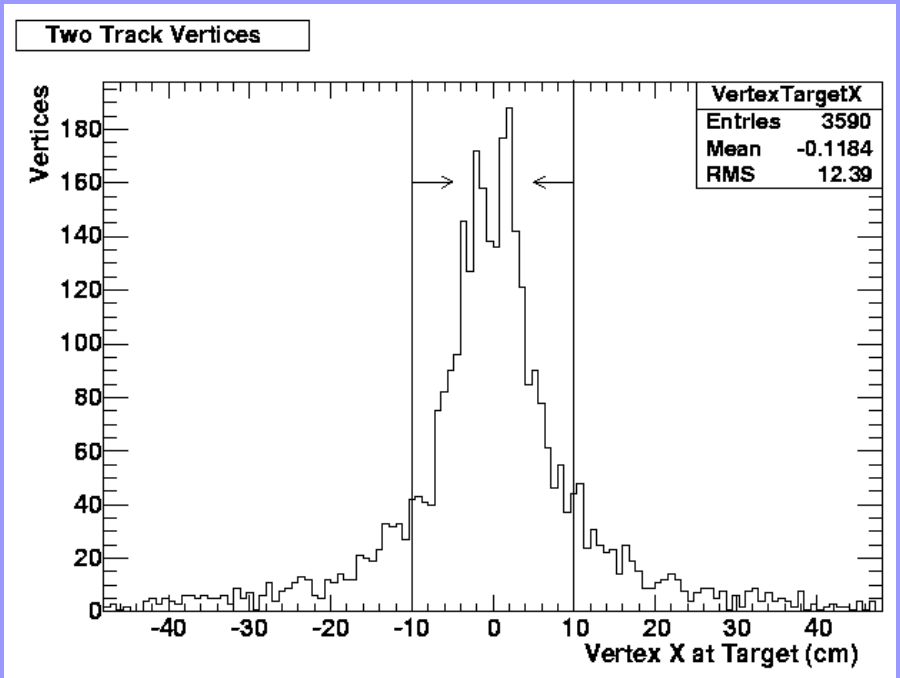
Require at least one track pointing away from target



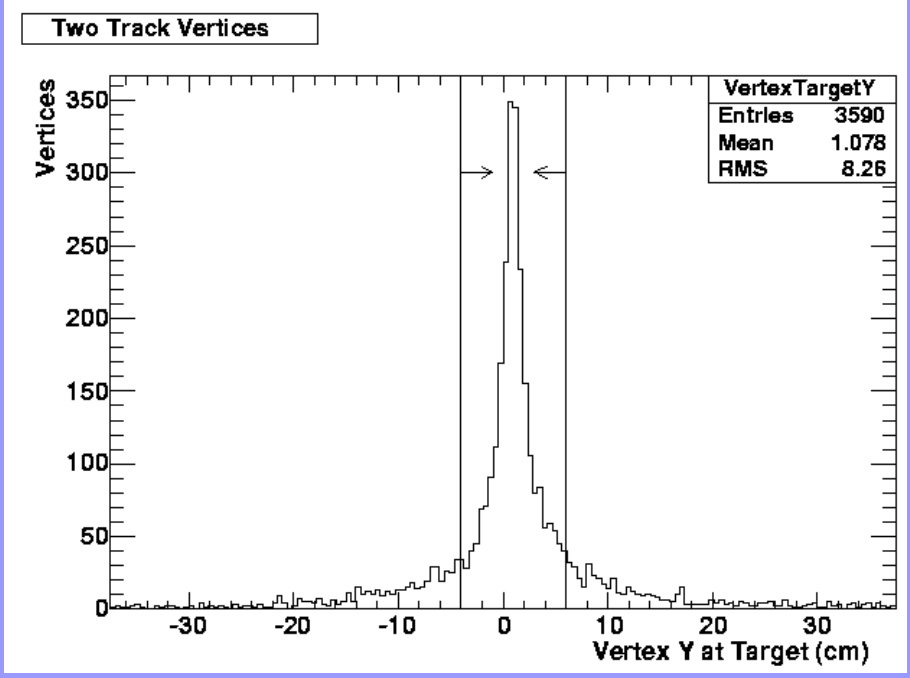
Top: Cut tracks with -1.5<x<1.5 cm

Right: Cut tracks with 0<y<3 cm

Project Sum of Track P To Target



Require that sum of track momenta points back to target



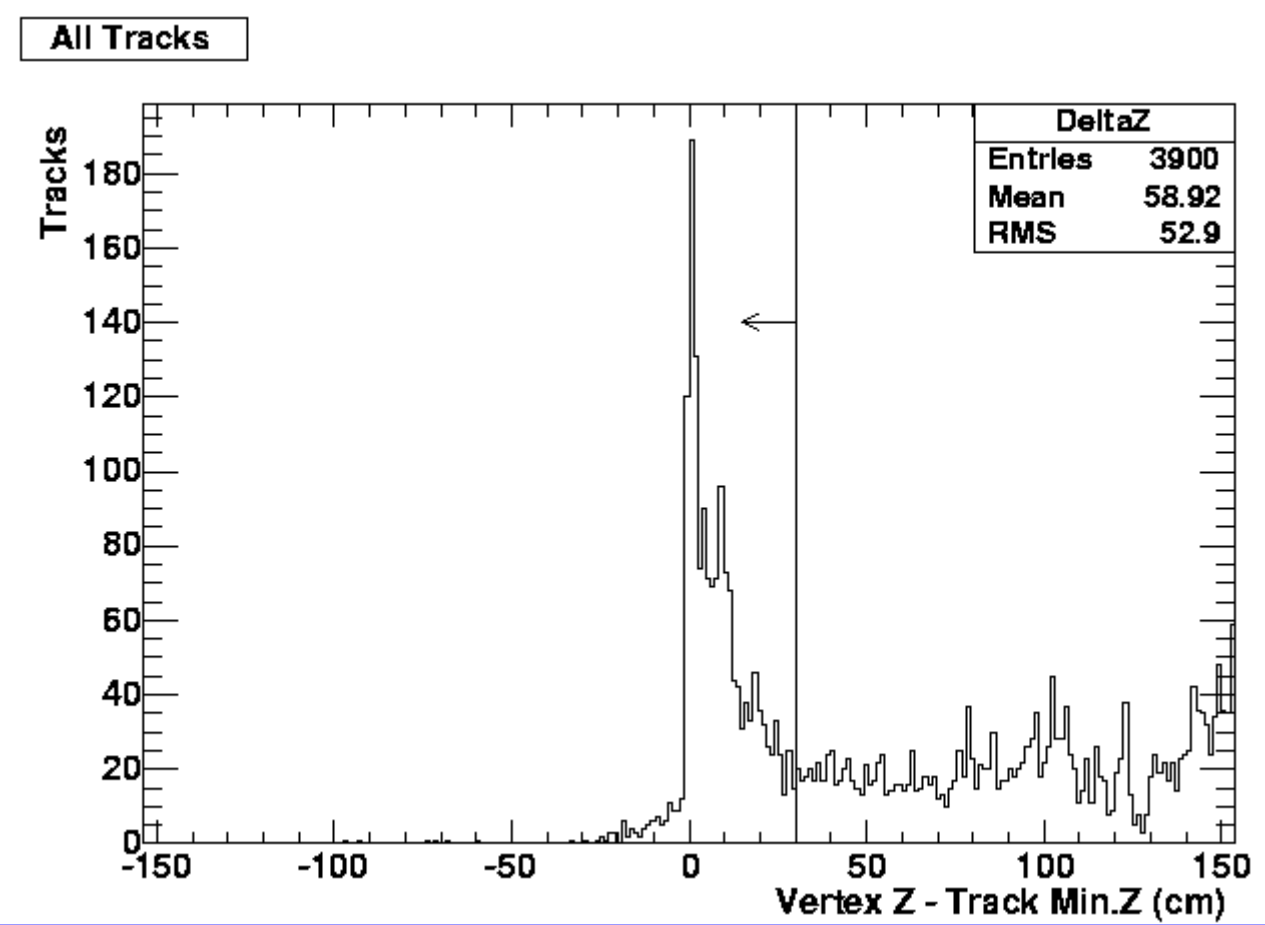
Top: Keep -10<x<10 cm

Right: Keep -4<y<6 cm

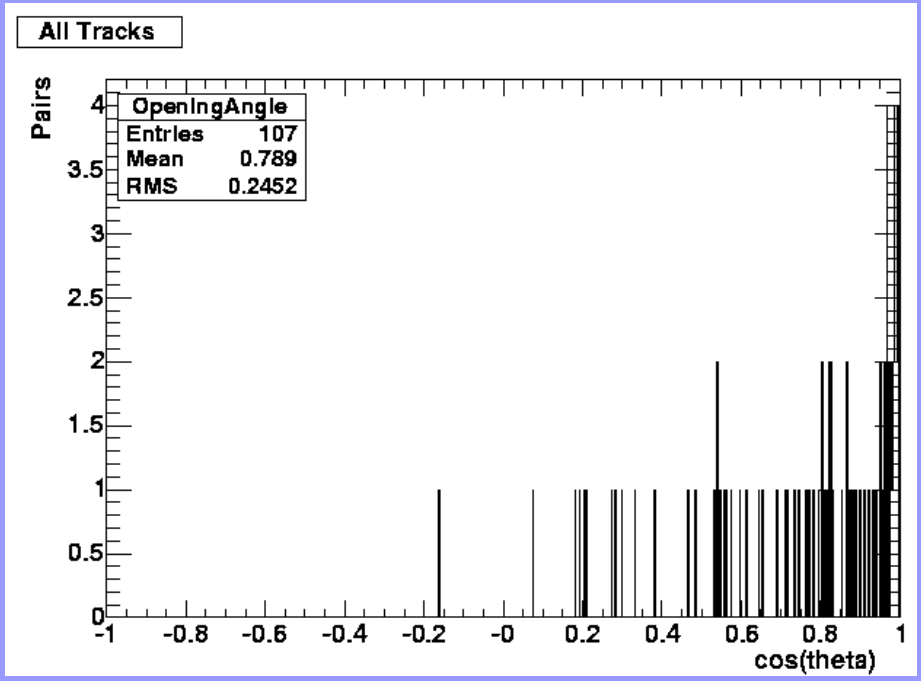
Delta Z

Vertex Z: Z location of vertex
Track Min. Z: Z location of most upstream hit associated with track
Eliminate tracks that start upstream of vertex

Keep z < 30 cm



Production Angle



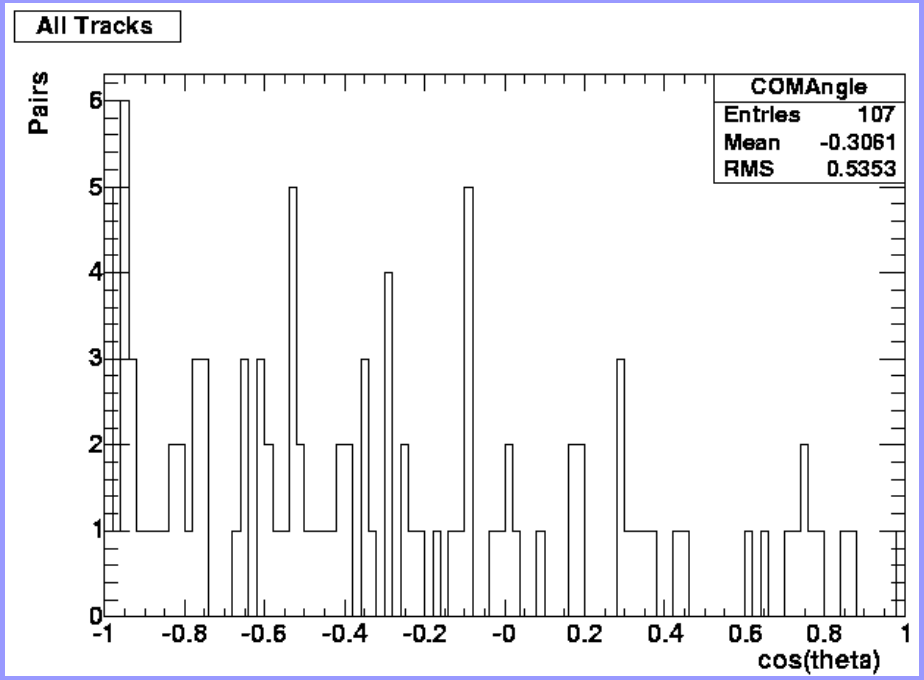
Left: Opening angle between tracks in lab fram

Bottom: Angle between track and Kaon in C.O.M. frame

Project p1,p2 onto Kaon direction

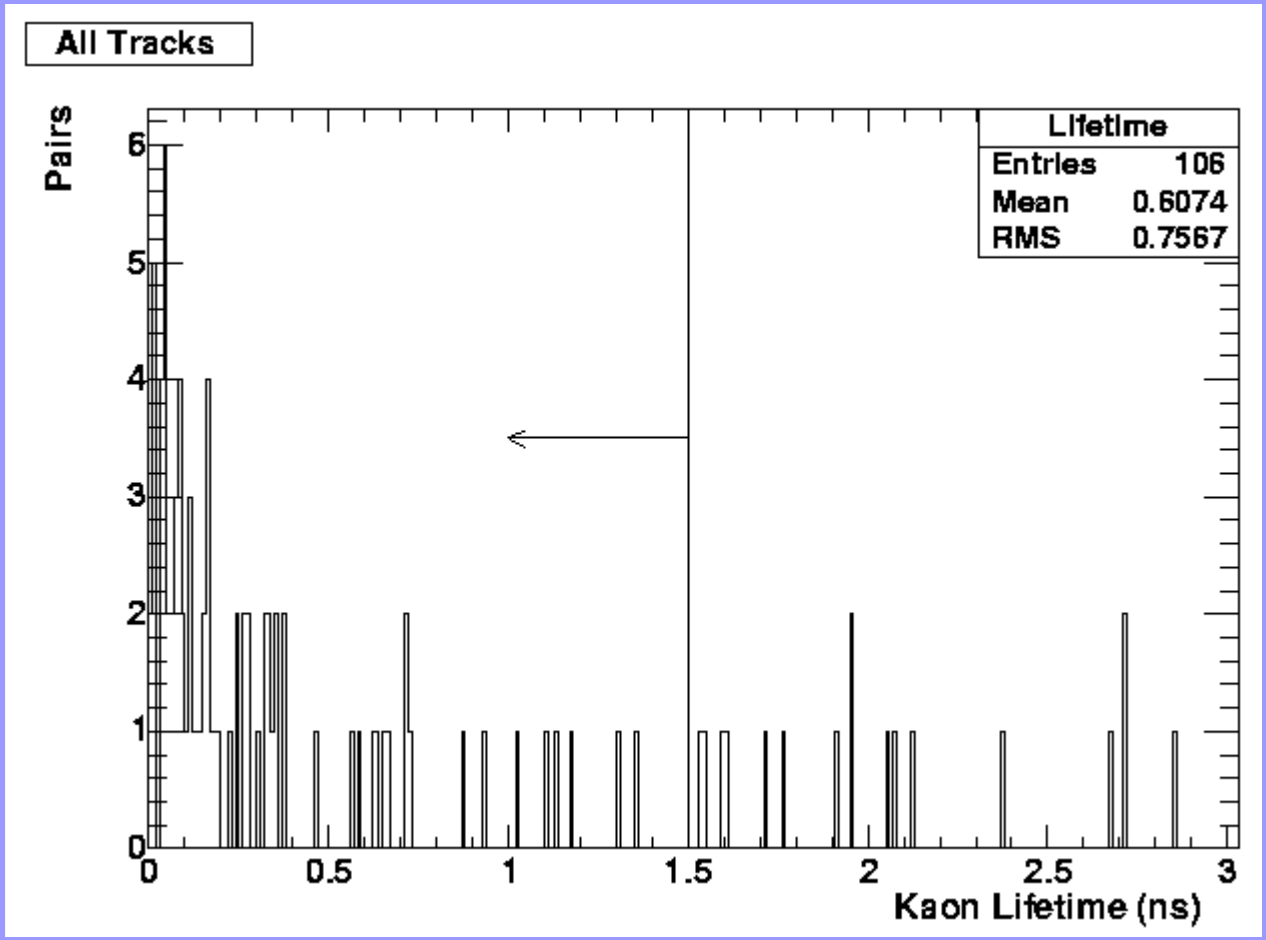
Calculate asymmetry

cos( ) = (p1-p2)/(p1+p2)



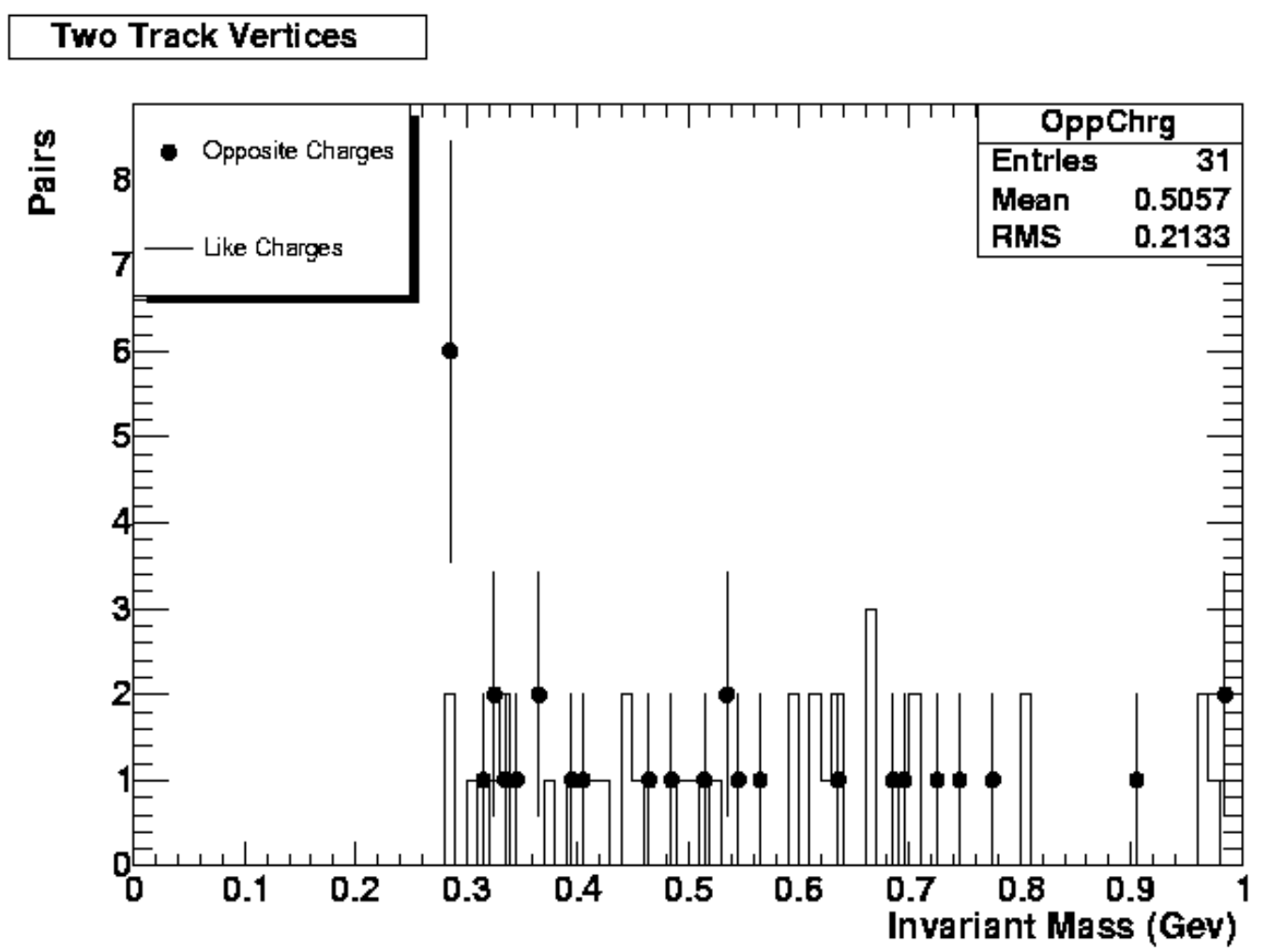
Lifetime

Lifetime of K-short ~ .1 ns



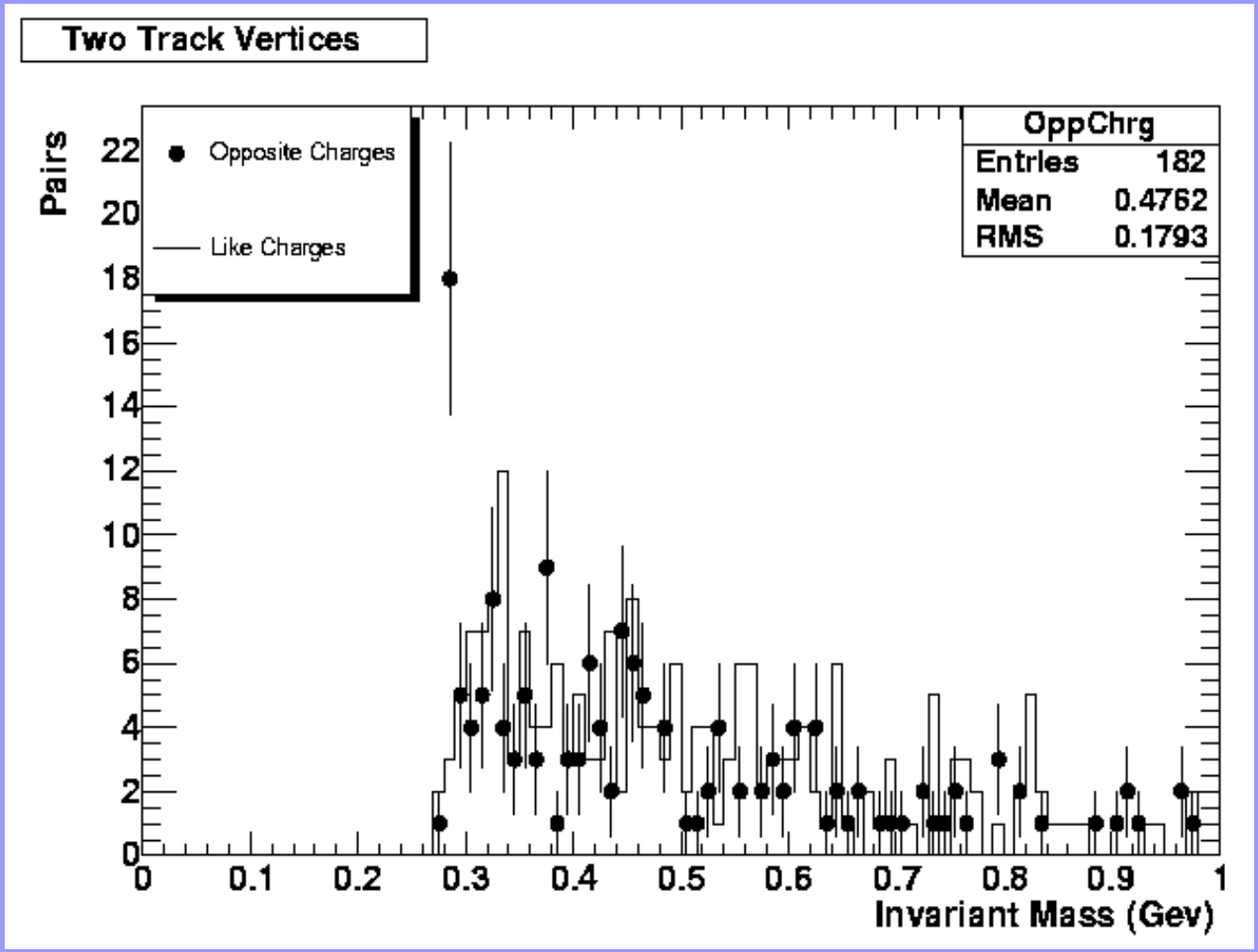
Keep vertices with lifetime < 1.5 ns

Invariant Mass



Error bar: opposite charges
Histogram : like charges

Invariant Mass



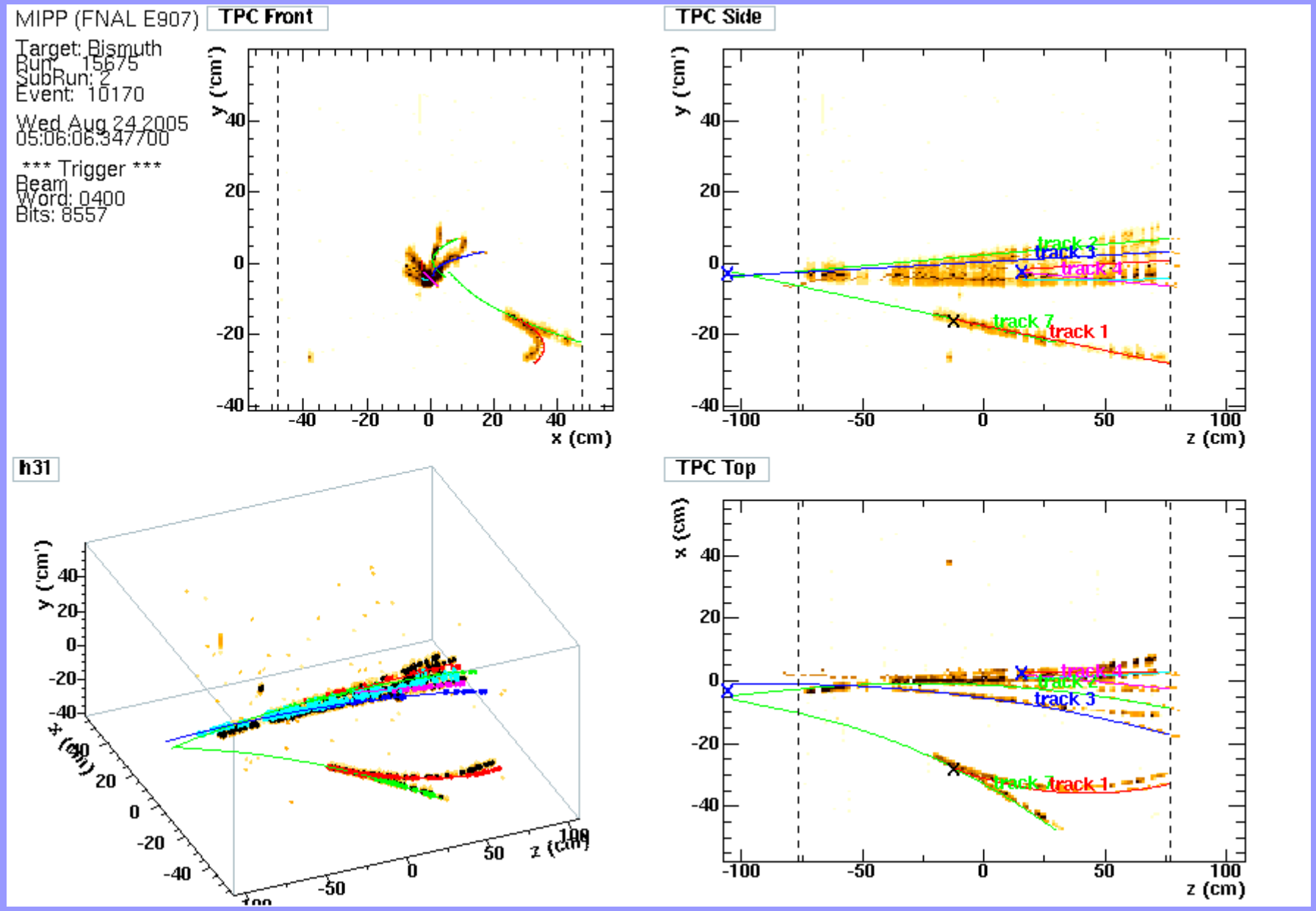
For 120 GeV Bi
Approximately twice Be statistics

Cuts

Cut	Remaining Vertices
None	14487
Curvature	12353
Track ^{2}/hits	10645
Vertex Position	7019
Vertex ^{2}	4851
Track points away from target	3590
Sum of p points to target	1950
z	107
Lifetime	81
Opposite Charges	31

Largest reductions from z cut

Sample Event Display



In Conclusion...

Clearly do not see an invariant mass peak that would indicate neutral decays

About 20-25% of events that pass cuts appear to be possible neutral decays based on hand scanning of Bi data set

To Do:
Hand scan to determine efficiency of vertexing for finding neutral decays