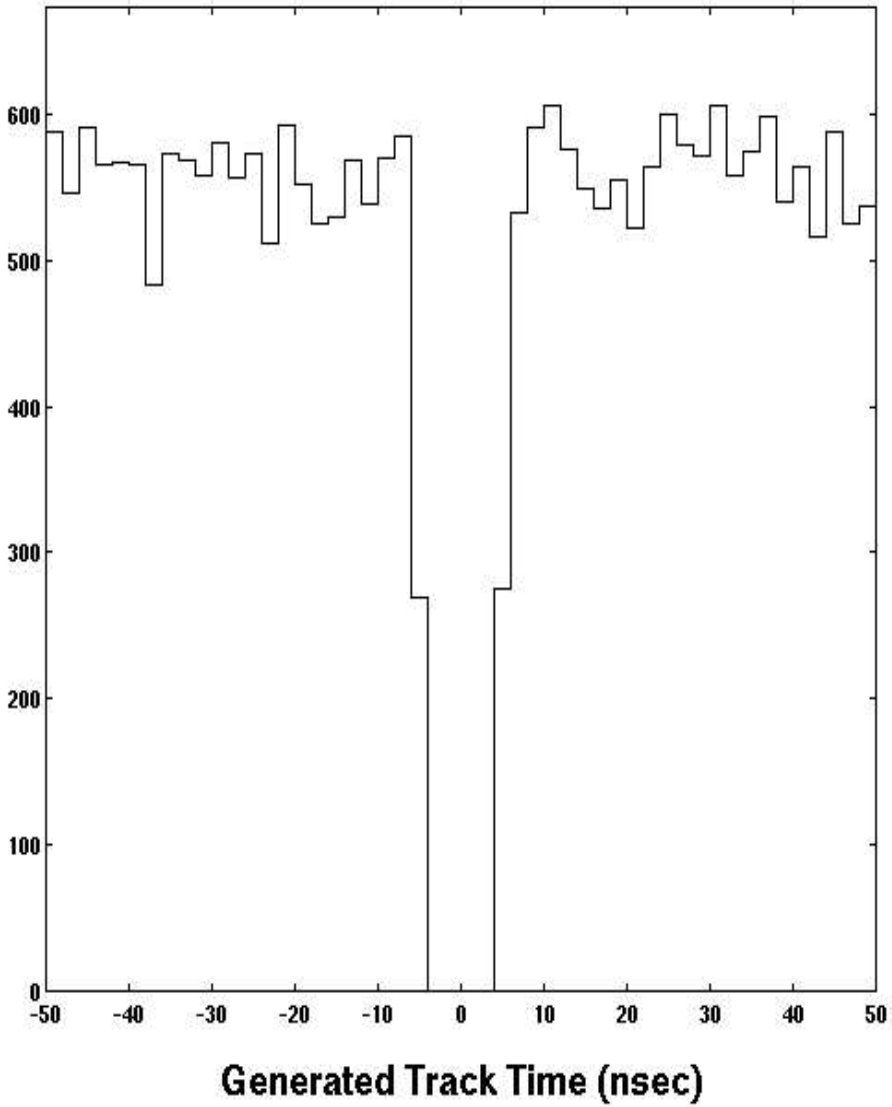
Final Result on UMS Simulation and Reconstruction

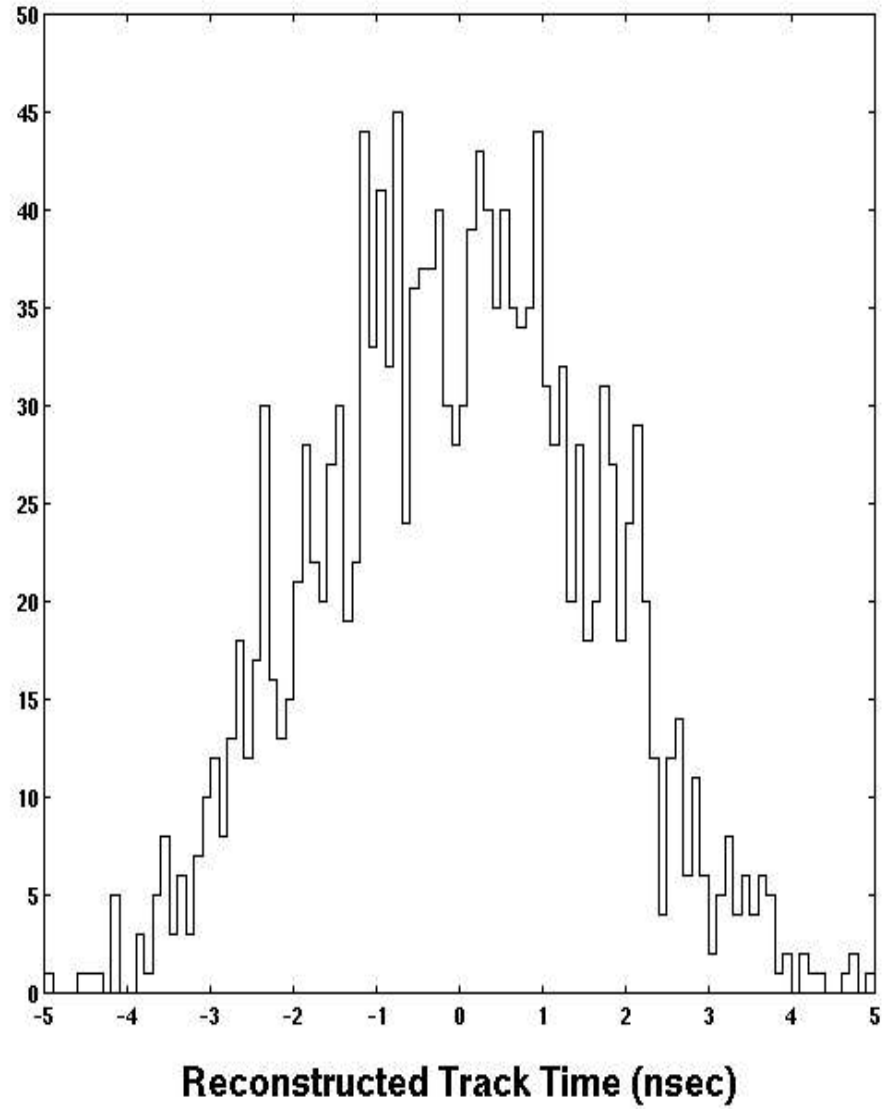
- `Final' means that these result are what would be shown to the PAC
- Fixed bug in generating event times for track overlays
- The question of ghost tracks
- Tweaks to the MC
- Estimate of contribution to Kpi2

Hogan March 9th 2005

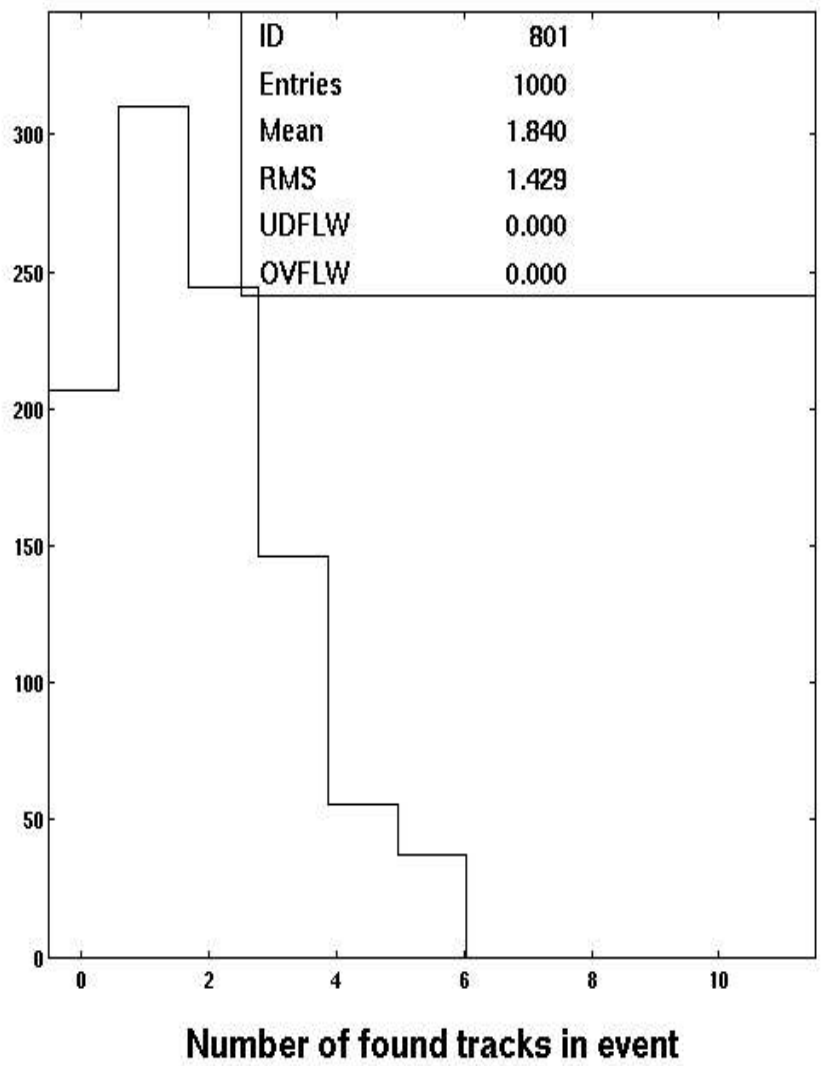
Special MC Sample Where No Intime Tracks Are Generated

However, track reconstruction finds intime tracks.





Reconstruction finds in-time tracks, even though none where generated.



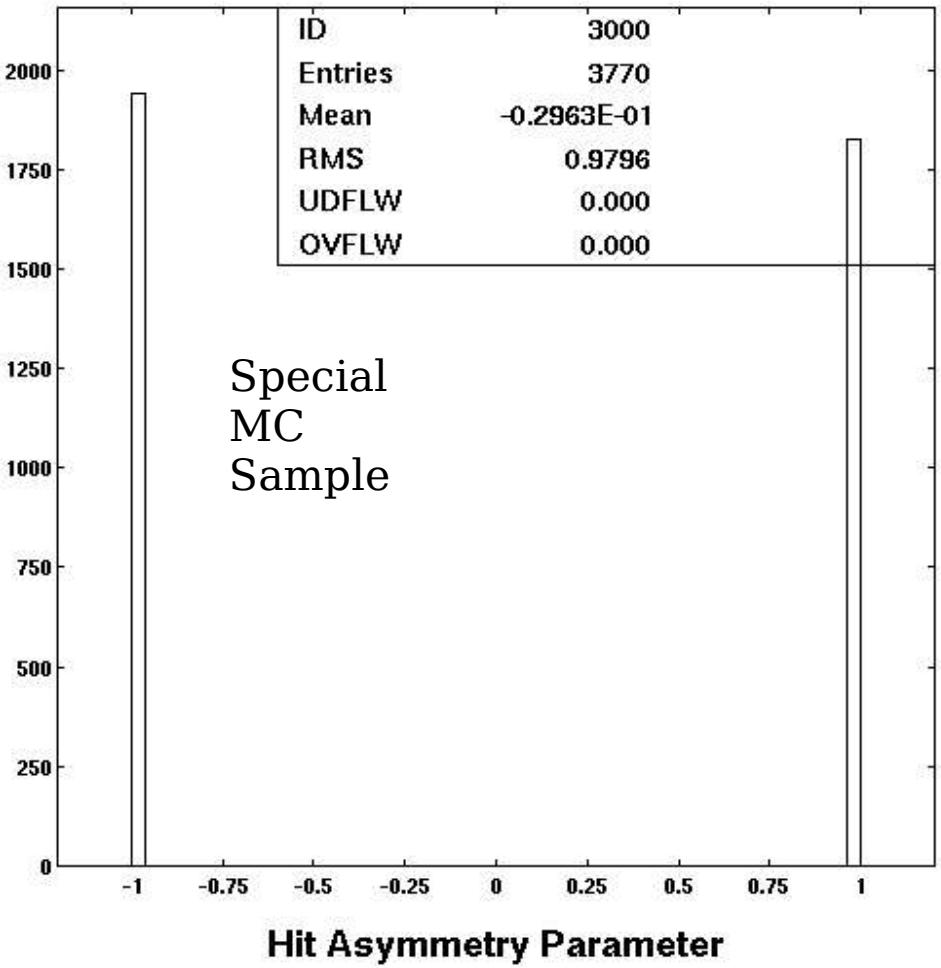
For 250 Mhz rate, about 1.8 ghost tracks are found per event.

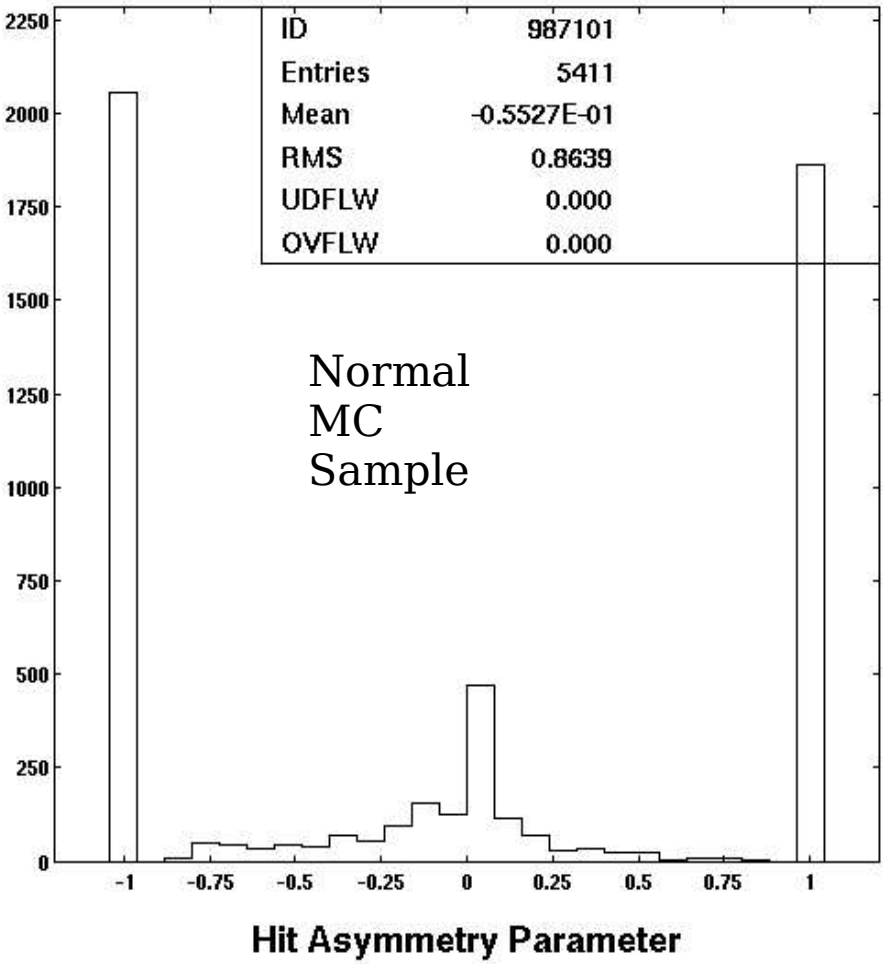
Ghost tracks happen when two (or more) out-of-time tracks strike the same strips.

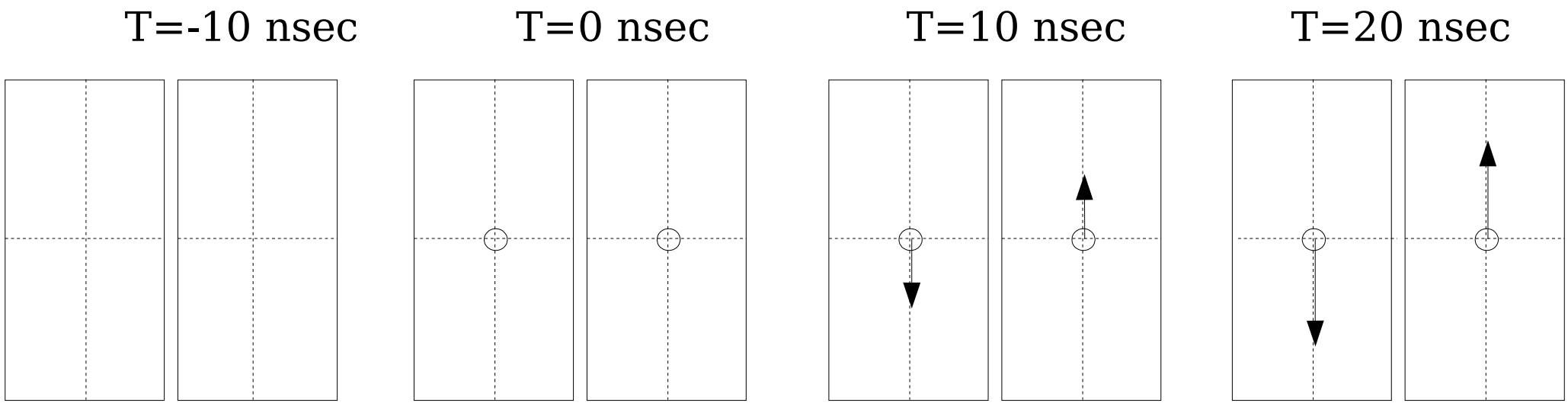
Reconstruction uses only “up” hits of one track.

Reconstruction uses only “down” hits of the other track.

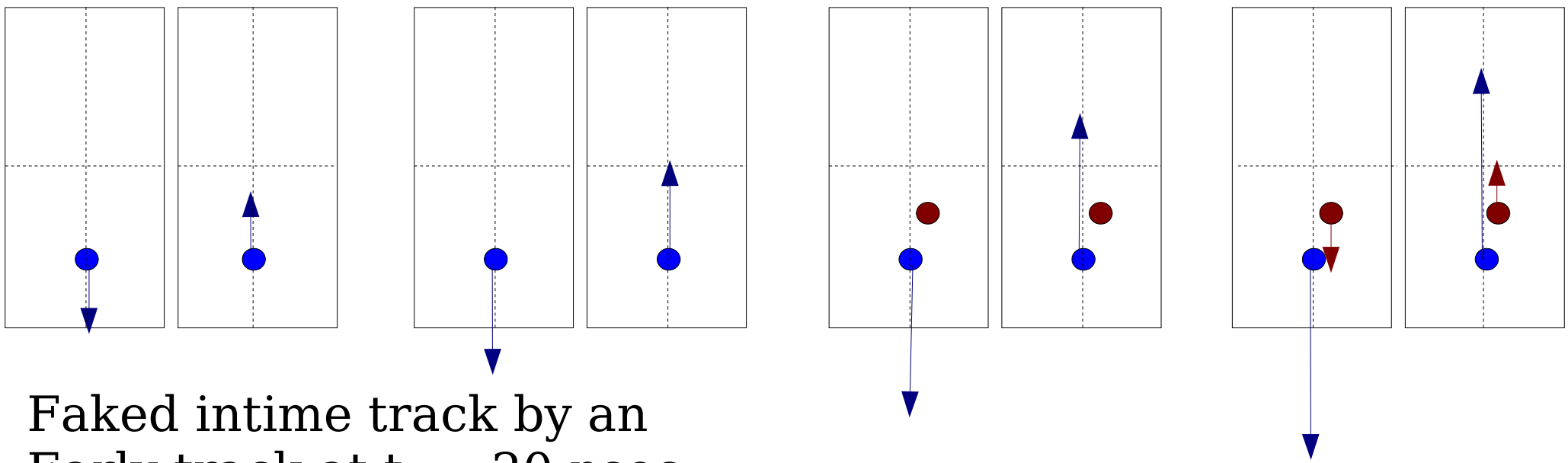
Asymmetry parameter describing how **generated** tracks contribute hits to **reconstructed** tracks.







In time track at t=0



Faked intime track by an
Early track at t = -20 nsec
and a Late track at t = 10 nsec

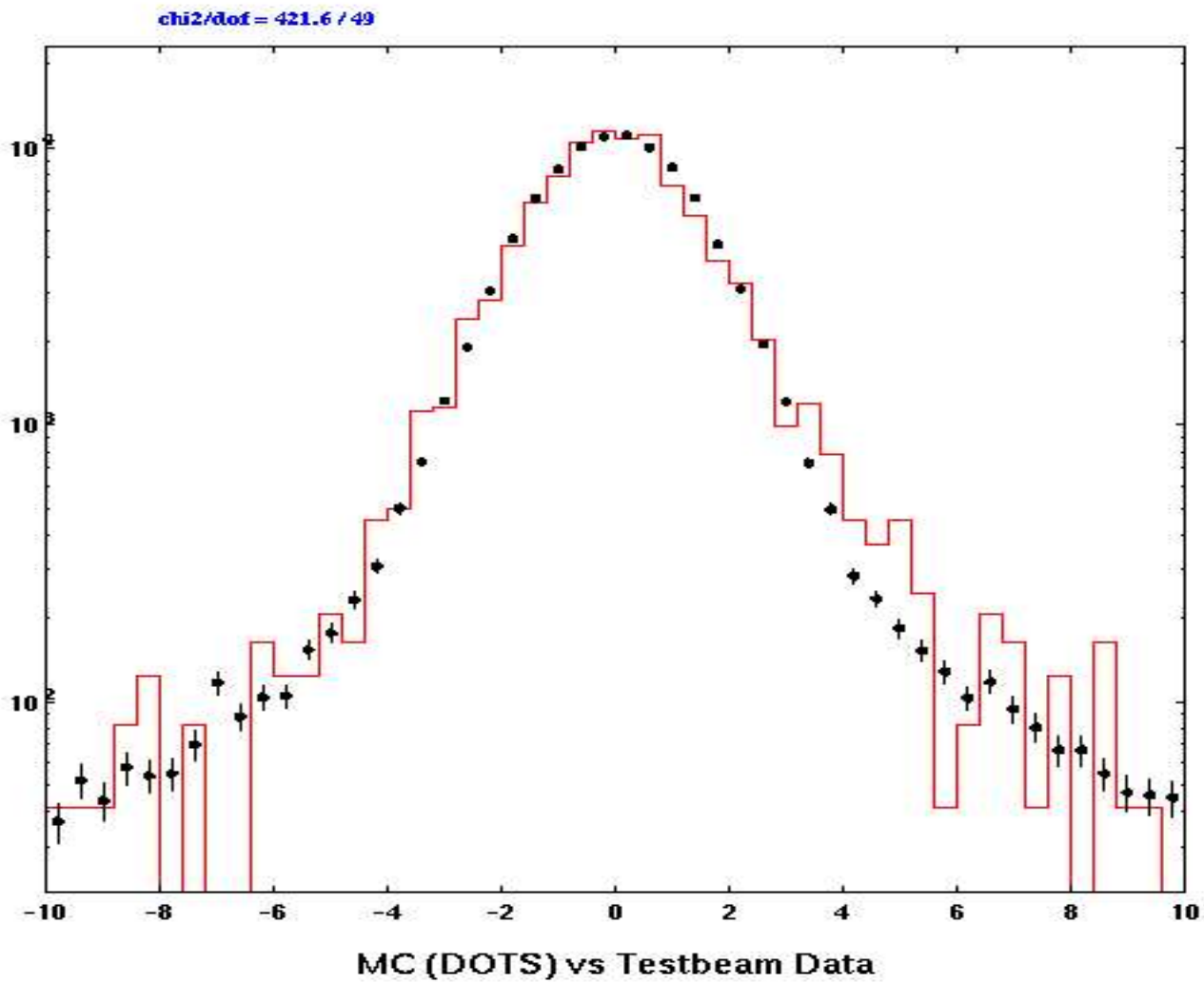
Simulation of Non-gaussian time Resolution

σ_1 = 0.83 nsec σ_2 = 1.29 nsec σ_3=5.11 nsec

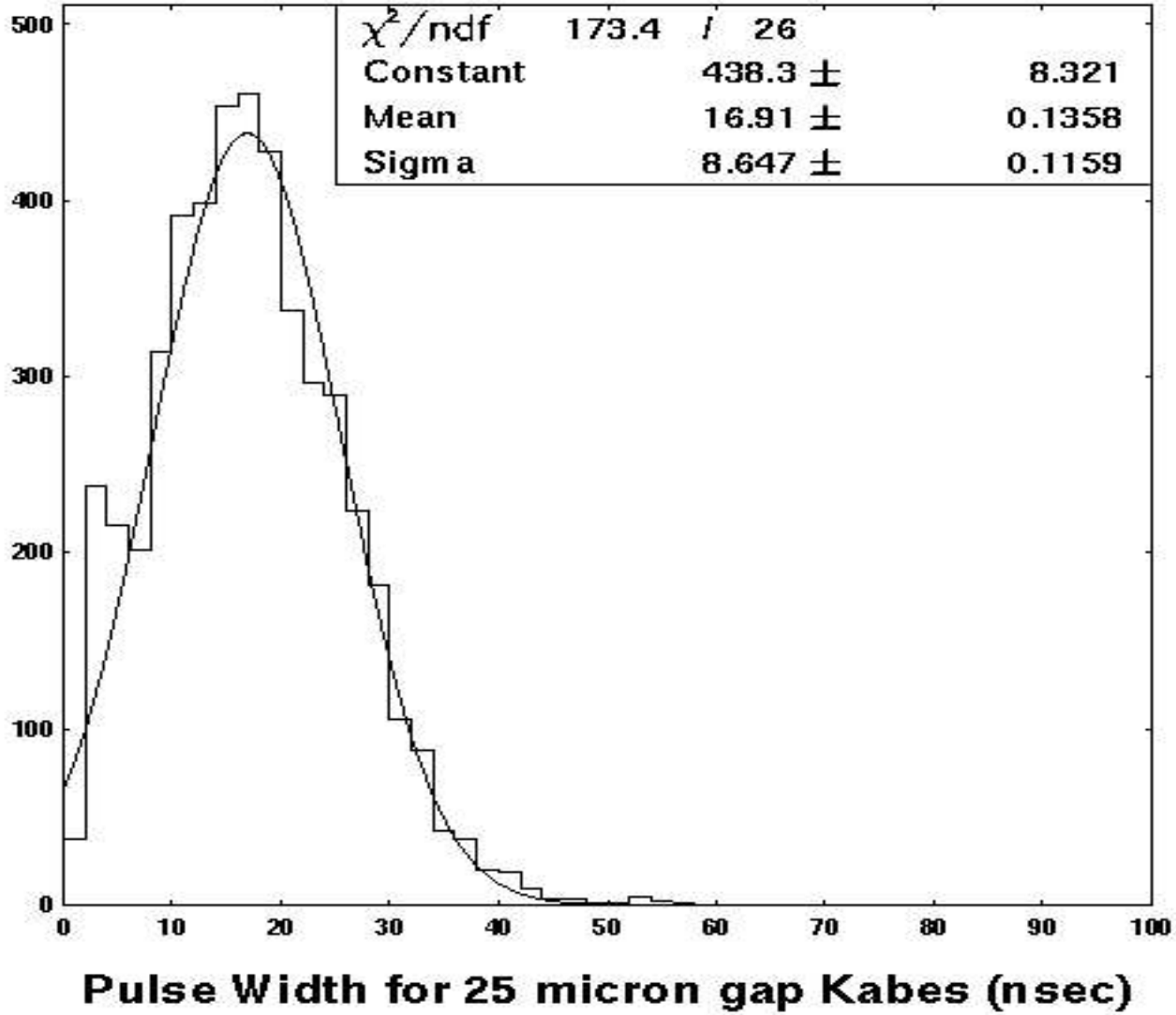
$w_1 = 605\sqrt{\sigma_1}$ $w_2=206\sqrt{\sigma_2}$ $w_3=13\sqrt{\sigma_3}$

Time difference (nsec) between hits in a doublet

Test beam data from 25 micron gap Kabes



Simulation of Pulse Width Fluctuations



Effect of accidental tracks on the Kπ2 background.

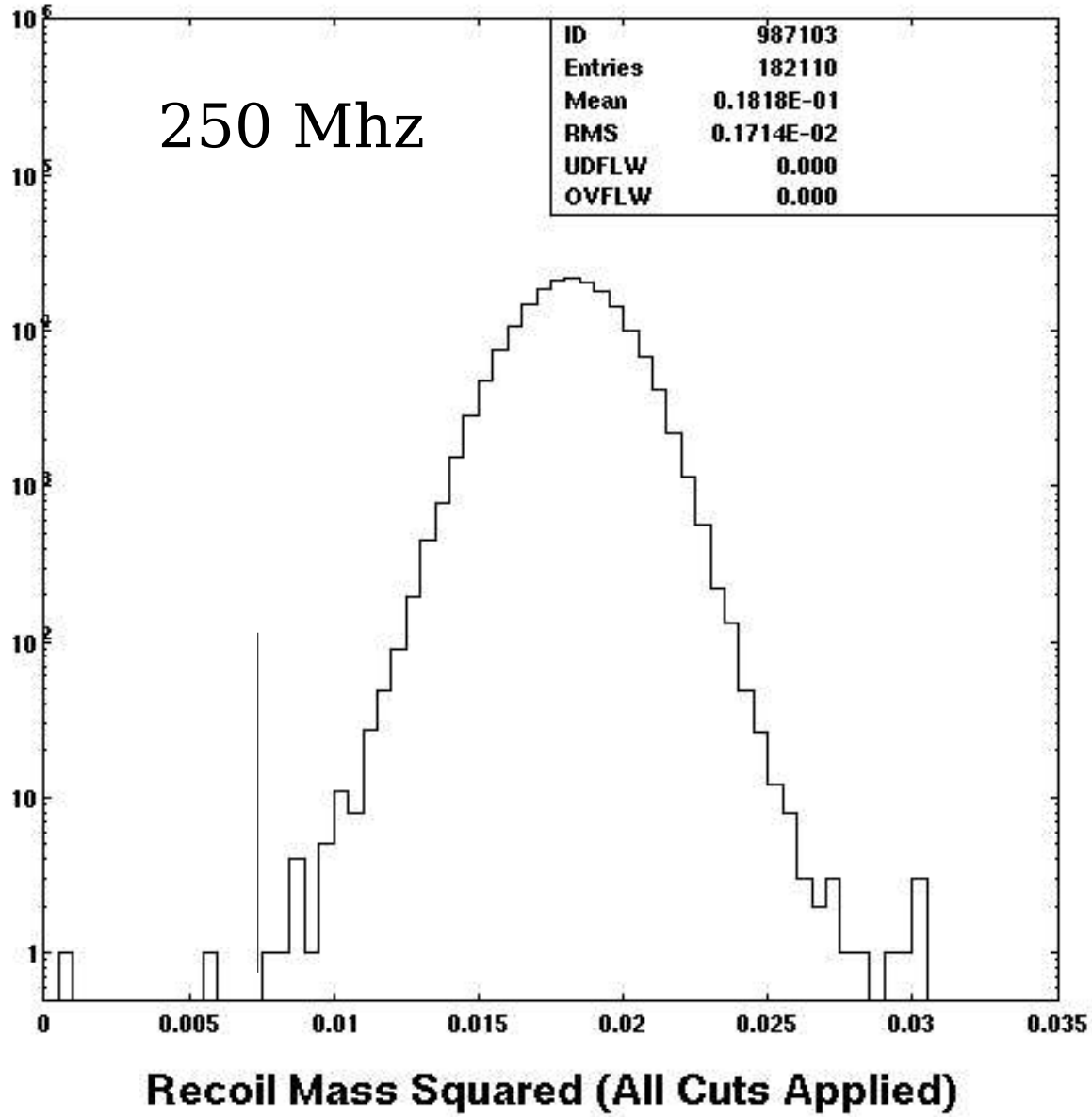
(1) K^+ track measurement is corrupted accidental hits

or

(2) we found many tracks in the UMS and we selected the wrong track.

Rejection in Region 1

2 events out of 182K = 1.1×10^{-5}.



- Hit simulation is as realistic as possible. It includes effects such as pulsewidth variations, merging of pulses that are too close in time, nongaussian time responses, and cluster size.
- Hit simulation tuned to match NA48/2 test beam data.
- $K\pi 2$ background is managable at 250 Mhz.
- Currently running simulations at higher beam rates