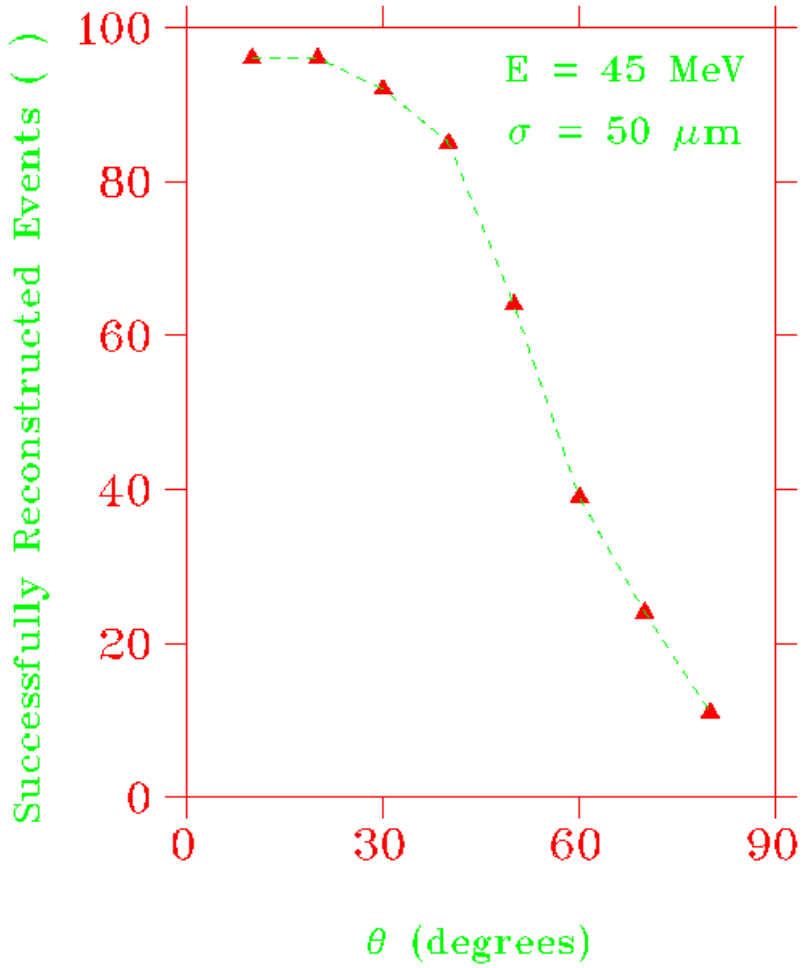
Kalman Tests IV

Percentage of Successfully Reconstructed Events

- Percentage depends on covariance matrix
- Can fit 100% of the events at each energy and angle if different covariance matrices are used.
- Need to understand this better (and hopefully find a way so that most of the events are fitted with the same initial covariance matrix).
- If not, possible solutions are:
  - Rely on first guess.
  - Change the intial covariance matrix when fit fails (over a predictable range).
  - These “last resorts” are more cpu intensive!



Simple Monte Carlo

σ = 100 μm

- Generated Values:

  R = 1.18 (cm)

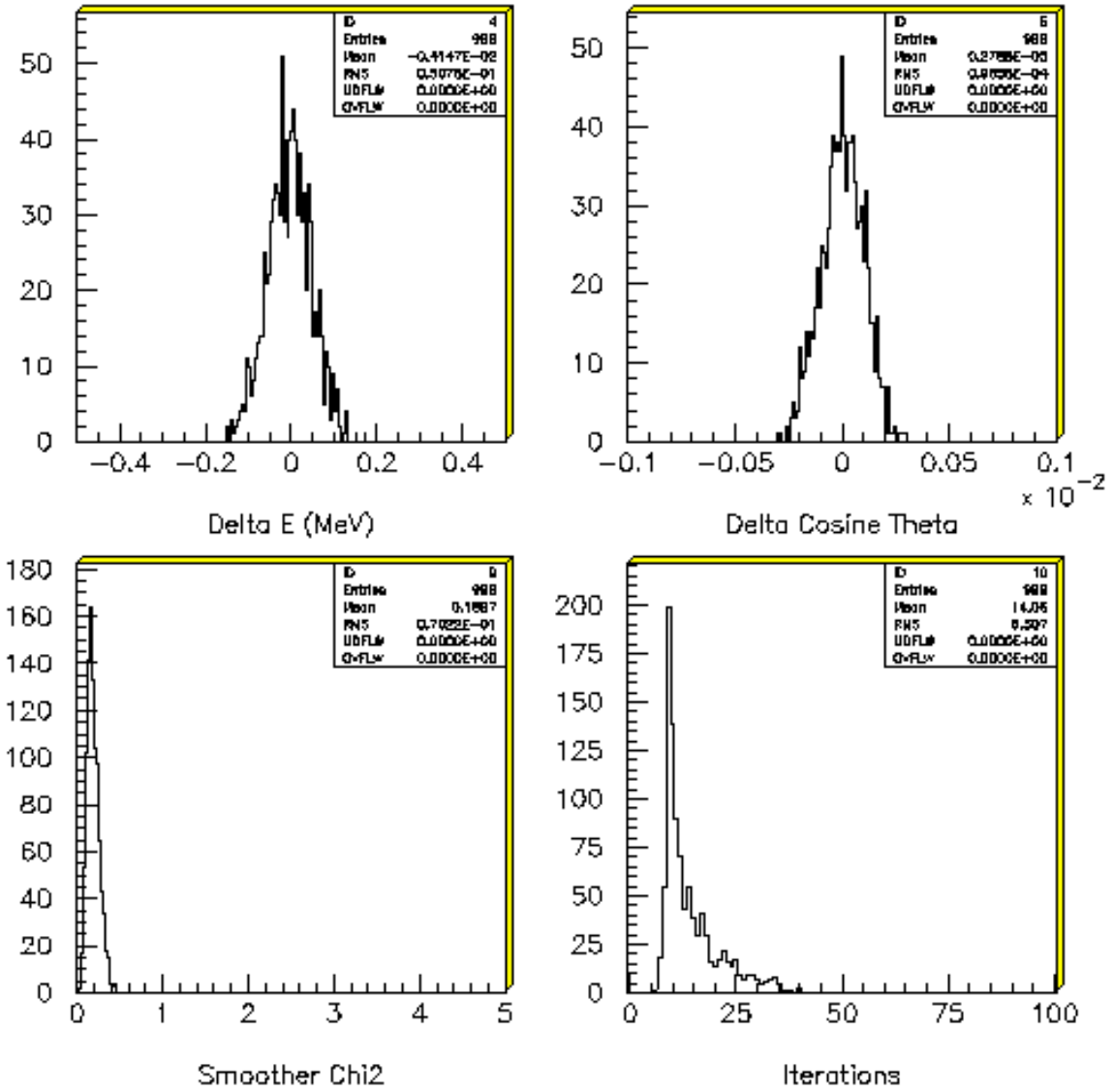
  E = 45 MeV

  $\theta = 10^0$

  σ = 100 μm

- Fit Results:

  Successfully reconstructed events: 99.9%.



Analysis of GEANT Monte Carlo

Fit To Wire Positions (σ = 2000 μm)

- Generated Values:

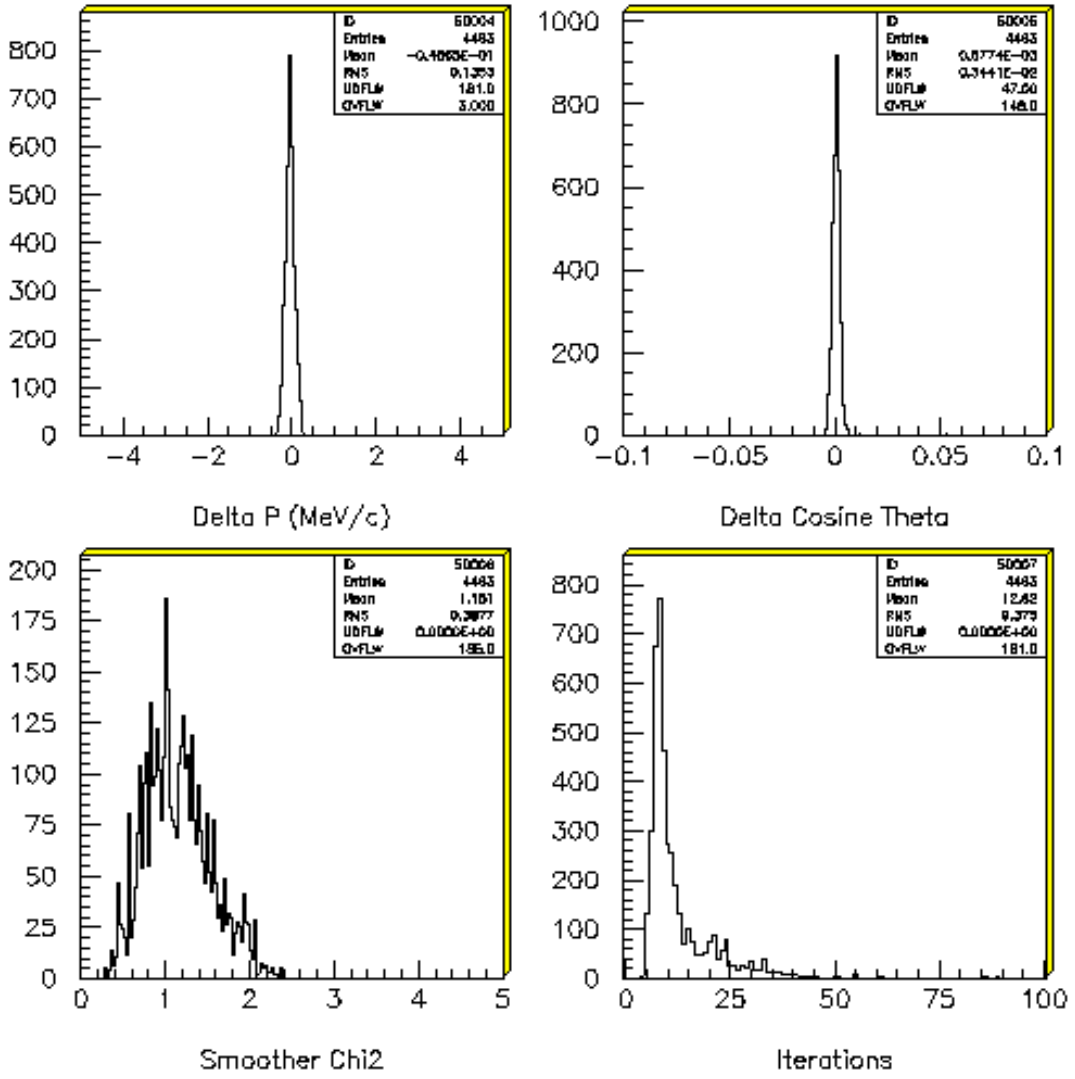
  E = 45 MeV

  $\theta = 10^0$

  σ = 2000 μm

- Fit Results:

  Successfully reconstructed events: 85%.



Tracking Jobs

Needed in the next few weeks!!

- GARFILED input file x(t,θ): Yuri, ??
  - Time in steps of 1 TDC channels (0.5 ns).
  - Angle θ small enough (depends on sensitivity of x to θ).
  - We will need more than one file in the future due to different chamber HV (and possibly pressure and temperature).
- Investigation of the covariance matrix problem and solutions. Farhana
- Tables for energy loss and multiple scattering: ??
  - Formulas for parametrizations in terms of ΔS (track length between planes).
  - Generating files from Monte Carlo.

November Run

Items For Discussion

- Field Off:
  - "high" energy beam (positrons > 100 MeV ?, EL and MS negligible).
    - Plane alignment.
    - Plane efficiencies.
    - STR investigations (comparisons between real data and GARFIELD, testing data iterations..)
    - ??.
    - Only at 0 degrees?

- Cosmics??

- Field On:
  - surface muon beam.
    - Helix tracking