STAR Year 1 Global Tracking

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Introduction

- Goals of Year 1 Global Tracking
  - Get best possible momentum fit
    - i.e. 3D fit including material effects
  - Allow a primary track population to be selected

Track refits

- Kalman <u>refit</u> of TPC tracks
  - Fitting only, not pattern recognition, that is done in TPC tracker

- Second fit including primary vertex as point on track

Kalman refit

- Fit Features
  - 3D fit
  - Accounts for multiple scattering (hard wired X_0 for P10) and energy loss in TPC gas (assumes pion mass)
  - Points may be removed in the smoother step
  - Full covariance matrix produced

Kalman fit details

- Code (FORTRAN) is from DELPHI, adapted to STAR by D.Liko and A. Saulys

- Co-ordinate system is:

  $r\phi$, z_0, $\tan\lambda$, ψ, q/p_T

- Calls to GEANT for material and dE/dx routines.

Primary track fit

- 2 x 2D fit

- Uses global track with hits as input
  - ◆ uses only those with DCA<3cm
    - ✦ this is meant as a loose initial cut

- Minimizes χ^2 for x-y (circle) and s-z (straight line) fits
  - ◆ Fits use points in first 180° of circle

- Result stored whatever it is, users decide final selection criteria (χ^2 of fit)
  - ◆ Fits which fail are however flagged

Next Steps

- Extend Kalman fit to include primary vertex. Will need limited geometry information.

- In Year 1 this is TPC only plus:
  - inner field cage - 0.6% X_0
  - N_2 gas
  - Be beam pipe - 0.3% X_0