#### Some updates

2012/06/07 RIKEN VTX software meeting Ryohji Akimoto

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- Fitting of SvxCentralTrack
- CNT QA

# Track Fitting

- I made a fitting code for SvxCentralTrack
  - This is for alternative for the fitting code with Kalman filter in case the fitting code with Kalman filter will not be ready for recalibrator.
- Basic idea is the same as the fitting code for SvxSegment, multi-circle fitting. In addition, phi0 and the0 of CNT are used to take into account matching of CNT.
  - For SvxSegment, only intermediate hit points are used in the multiple scattering term in chi2. But for SvxCentralTrack, the first hit is also used.
  - phi0 is updated using DCA by the same way as of momentum recalibrator.



#### Single track simulation

- Simulation
  - particle : charged-pi
  - momentum : 1 GeV/c
  - event vertex : ±1.0 cm (flat dist.)
- Simulation study : found a bug to calculate momentum and fixed it.
  - checked phi0, the0, and pT as a function of simulation XY-DCA.
  - also checked chi2 and XY-DCA after bug fix.

$$\checkmark \text{chi}^2 = \sum \frac{\Delta x_{local}^2}{\sigma_x^2} + \sum \frac{\Delta z_{local}^2}{\sigma_z^2} + \sum \frac{\Delta \theta^2}{\sigma_\theta^2} + \frac{(p_{Treco} - p_{TCNT})^2}{\sigma_{p_T}^2}$$

 $\checkmark$ x-local, z-local : 2 axes on sensor plane.

#### reconstructed momentum v.s. DCA (simulation)



Both phiO and pT do not depend on simulation DCA.

## 2D-DCA



- DCA resolution is improved by bug fix.
  - resolution : 60µm (no chi<sup>2</sup> cut)
- reconstructed DCA does not depend on simulation DCA.

#### chi-square



chi<sup>2</sup> depends on neither simulation DCA nor simulation the0.

## CNT QA

- I checked the number of good CNTs as a function of run number for run QA.
  - cut for event selection
    - ✓ BBC charge > 50
    - ✓ BBC z-vertex < 20
  - cut for CNT

√ track quality : 31 or 63

√ |zed| < 75

- also check with cuts for VTX
  - cut for event selection and CNT + chi2/ndf<10 & nhit>2
- check the numbers of low and high pT tracks.
  - low pT : 0.4 < pT(GeV/c) < 0.8
  - high pT : 0.8 < pT(GeV/c) < 5

### Result

# of tracks / event



run number

• CNT : looks good except for some runs

**Only CNT** 

- CNT + VTX : wider distribution, especially before 4th repair.
  - But it comes from bad runs and the distribution for good runs looks good.



