Forward Tracking II

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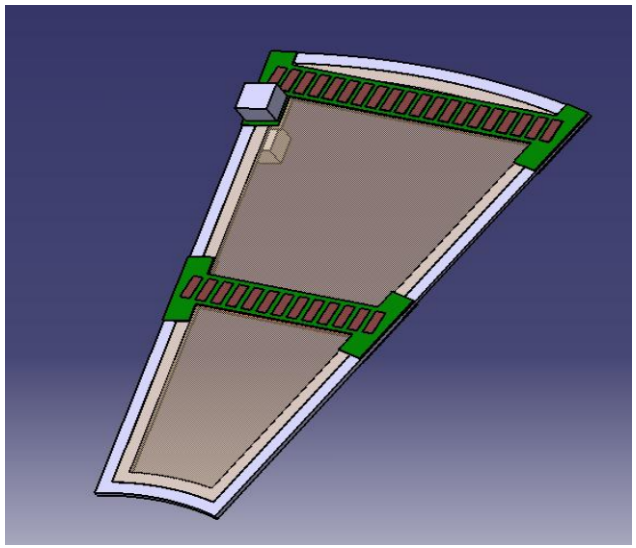
Digitization of FTD

Current Status

- Not defined yet the technology, so digitization is done via gaussian smearing of the simulated hits
- Smearing in XY local coordinates in all Disks
  - Disks 1-3: pixel Si detector
  - Disks 4-7: micro-strip Si detector
- For strip detectors smearing must be done in the direction of the strips: RΦ coordinate



Digitization of FTD

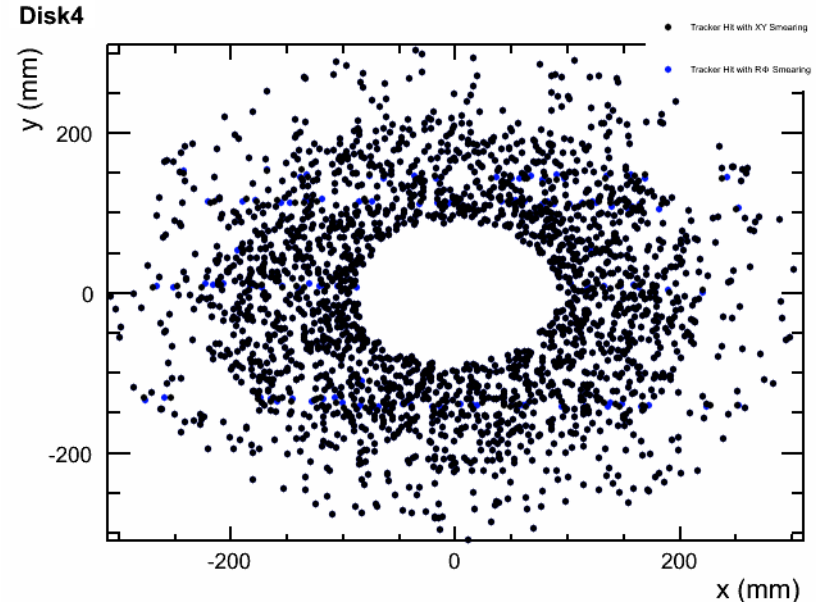
RΦ Smearing Implementation

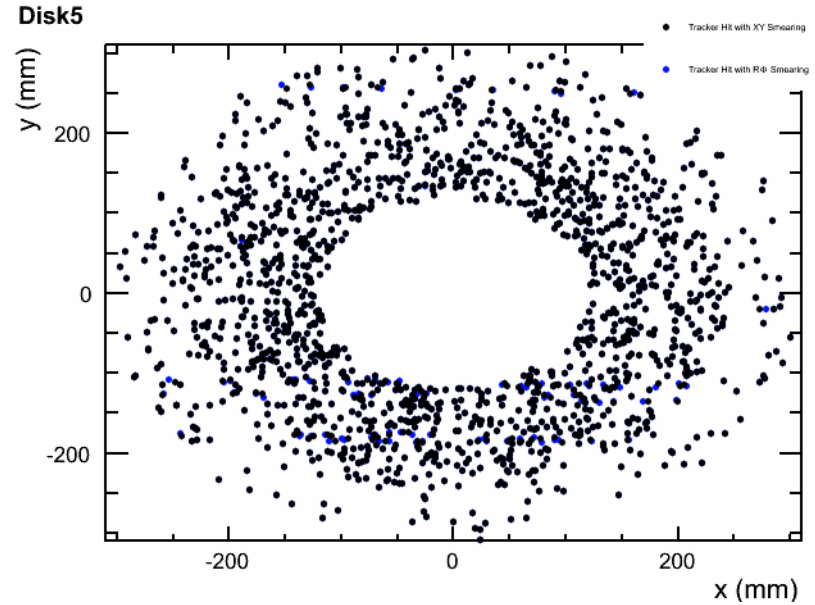
- ilcsoft Release v01-08
- MarlinReco v00-17-02
- TrackDigi/FTDDigi/
  - include/FTDDigiProcessor.h
  - src/FTDDigiProcessor.cc

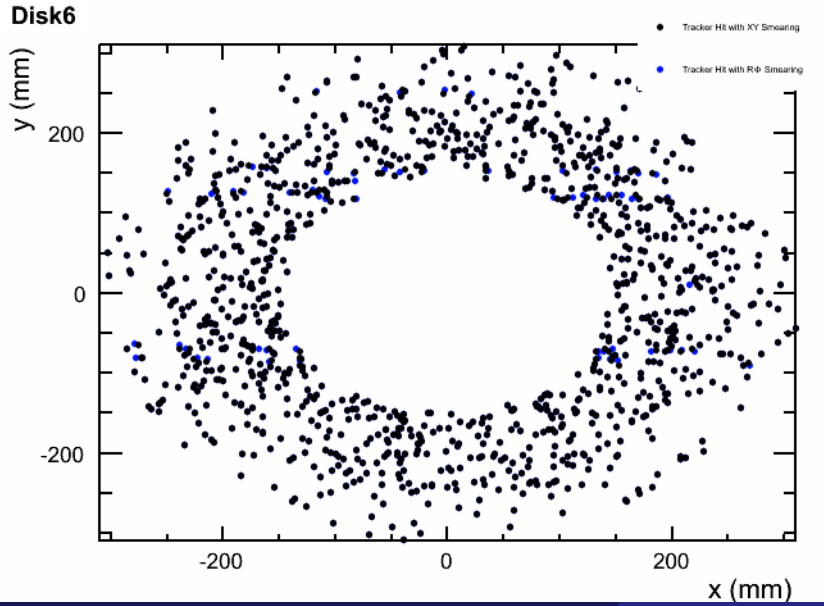
```
const double *pos ;
pos =  SimTHit->getPosition();
/*  changed to RPhi smearing
double xSmear = gsl_ran_gaussian(r,_pointReso);
double ySmear = gsl_ran_gaussian(r,_pointReso);// */
double R = sqrt(pos[0]*pos[0]+pos[1]*pos[1]);
double Phi  = atan2(pos[1], pos[0]);

double rSmear = gsl_ran_gaussian(r, _pointReso);

double newR = R + rSmear;
double newPos[3] ;
/*  changed to RPhi smearing
newPos[0] = pos[0] + xSmear;
newPos[1] = pos[1] + ySmear; // */
newPos[0] = newR*cos( Phi );
newPos[1] = newR*sin( Phi );
// No semaring of Z coordinate
// position of FTD layer is fixed along Z axis
newPos[2] = pos[2] ;

//store hit variables
TrackerHitImpl* trkHit = new TrackerHitImpl ;

trkHit->setPosition(  newPos  ) ;
```

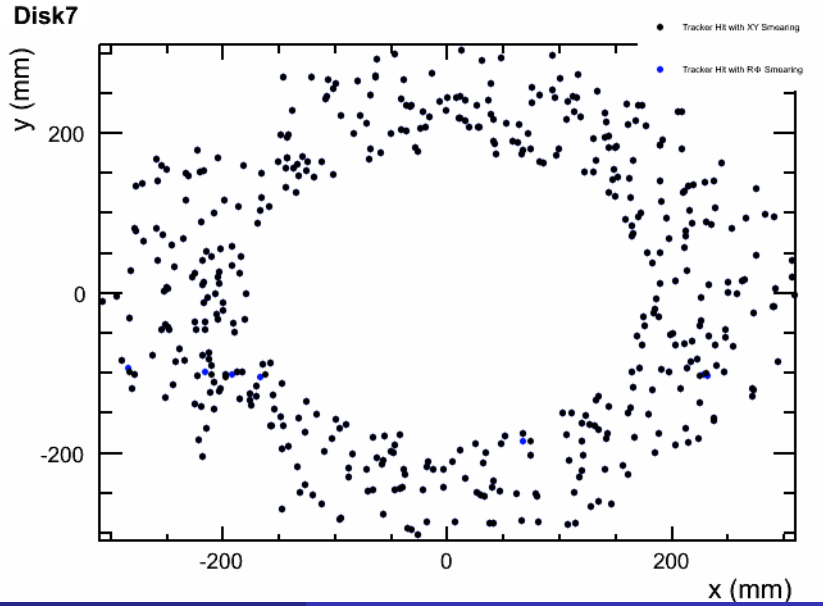
Digitization of FTD

Muon Single Particle, $\theta \in (1, 40)$, $p \in (1, 50) GeV/c$



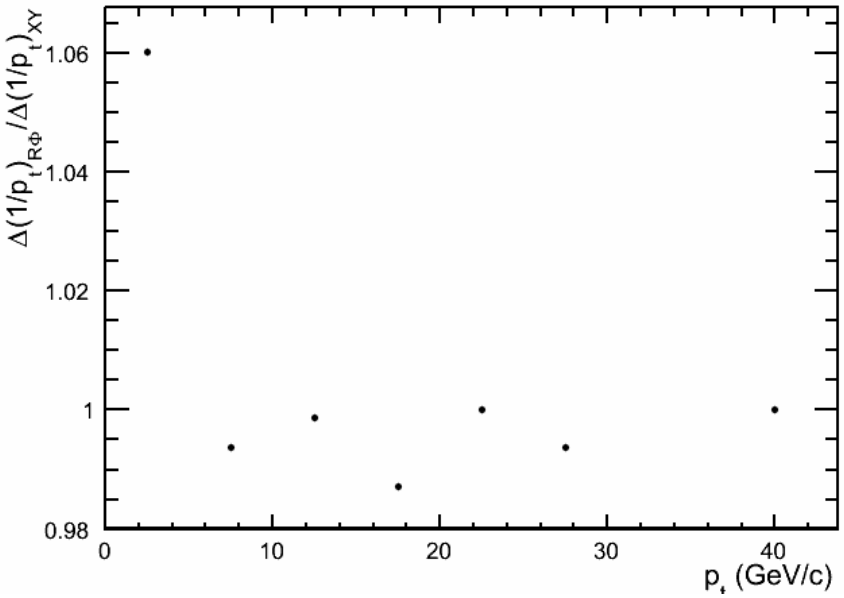


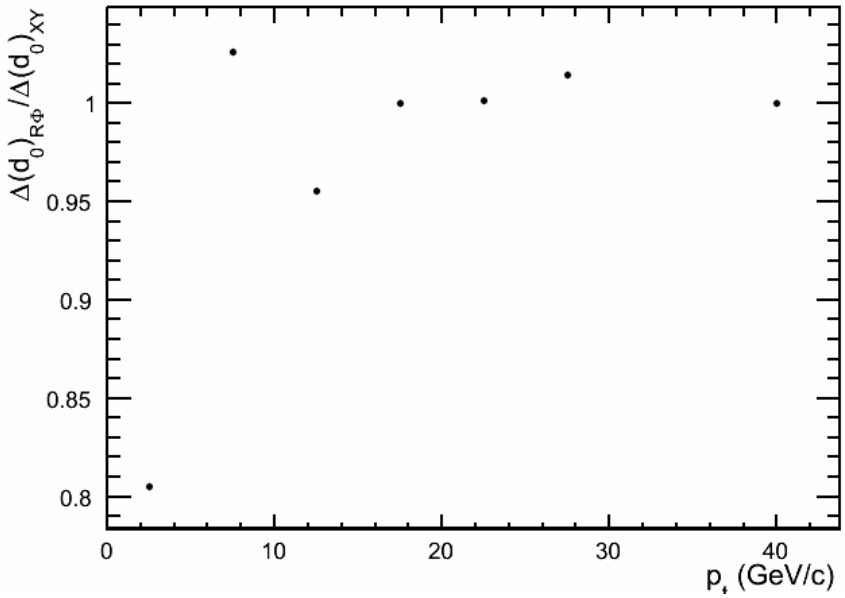




Digitization of FTD

Muon Single Particle, $\theta \in (1, 40)$, $p \in (1, 50) GeV/c$



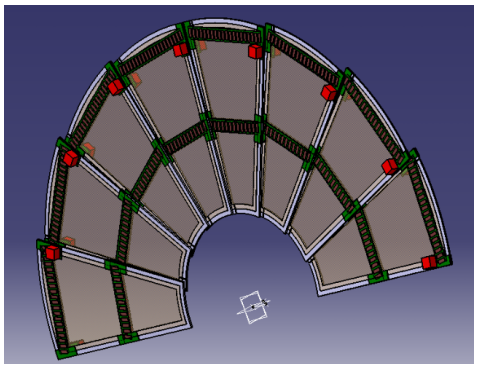


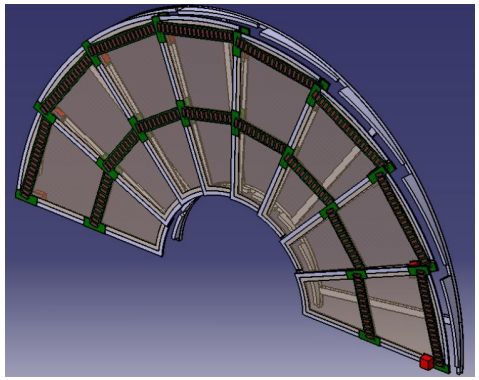
Using only VTX+FTD+SIT+SET (Silicon Tracking) in Reconstruction

CAVEAT: VERY PRELIMINARY RESULTS

More Detailed Geometry

Next Step





- New detailed description of FTD (ILD inner region integration meeting last week in Paris between the involved groups).
  - More realistic module design
  - Estimations of cablind and Routing
  - FTD Disk supports
  - ...
- Have to include the new description in Mokka database
- Update (if necessary) the FTD Mokka driver

FrL2RProcessor

Utility to convert slcio files to ROOT

- From LCIO to Root Processor (FrL2RProcessor) integrated in the Marlin Framework has been developed.
- It permits convert LCIO data format files in a .root file..
- Support for some collections of the LCIO data format (MCParticles, hits and simulated hits, Track, ...). The collections are stored in TTree's.
- Source code and instructions can be downloaded in

  http://devel.ifca.es/~duarte/repos/FrL2RProcessor/FrL2Processor.tar.gz
- Feedback for bugs, suggestions,...: duarte@ifca.unican.es

Summary

- Digitization of FTD done by a new smearing in RΦ
- Validating the smearing is on process.
- New detailed FTD's description
- Processor to convert slcio to ROOT files: FrL2RProcessor