KalTest for VTX and FTD

ILD software meeting

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New silicon tracking

- Silicon tracking processor will be rewritten.
  - Using Kalman filter method. → KalTest !
  - Taking advantage of double sided VTX.

- To use Kalman filter method in silicon tracking, geometry of 3 doublet VTX (and FTD) were implemented into KalTest.

To Implement new detector into KalTest

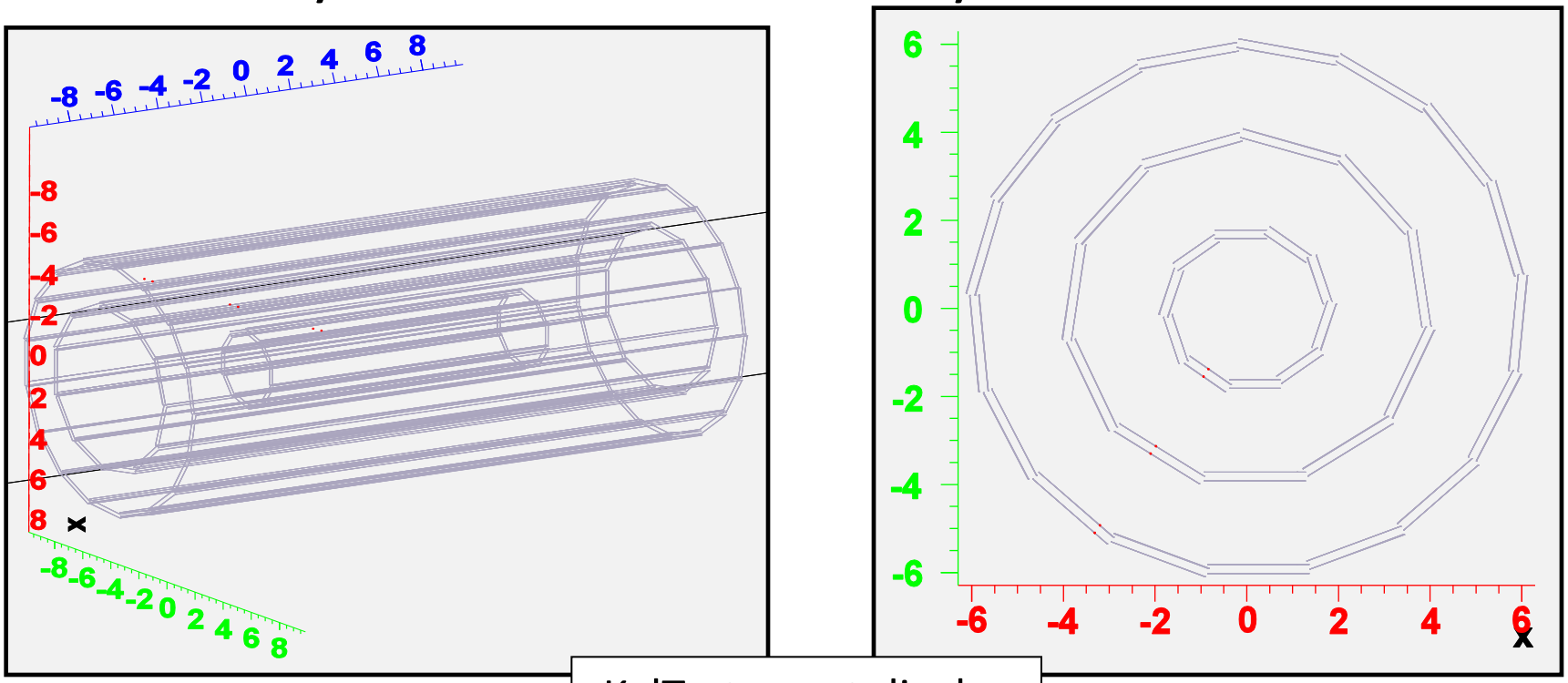
- Use-implemented classes.
  - MeasLayer : a measurement layer that multiply-inherited from an abstract measurement layer class TVMeasLayer and a shape class derived from TVSurface in GeomLib.
  - KalDetector : an array class derived from TVKalDetector that holds the user-defined MeasLayers with any shape and/or coordinate system. And this also defines material distributions in the tracker.
  - Hit : a coordinate vector class as defined by the MeasLayer, which inherits from TVTrackHit.

- See KalTest home page : http://www-jlc.kek.jp/subg/offl/kaltest/

Implementation of VTX into KalTest

- In example of KalTest, VTX is just a tube.

  → Modify into 3 double sided layers.

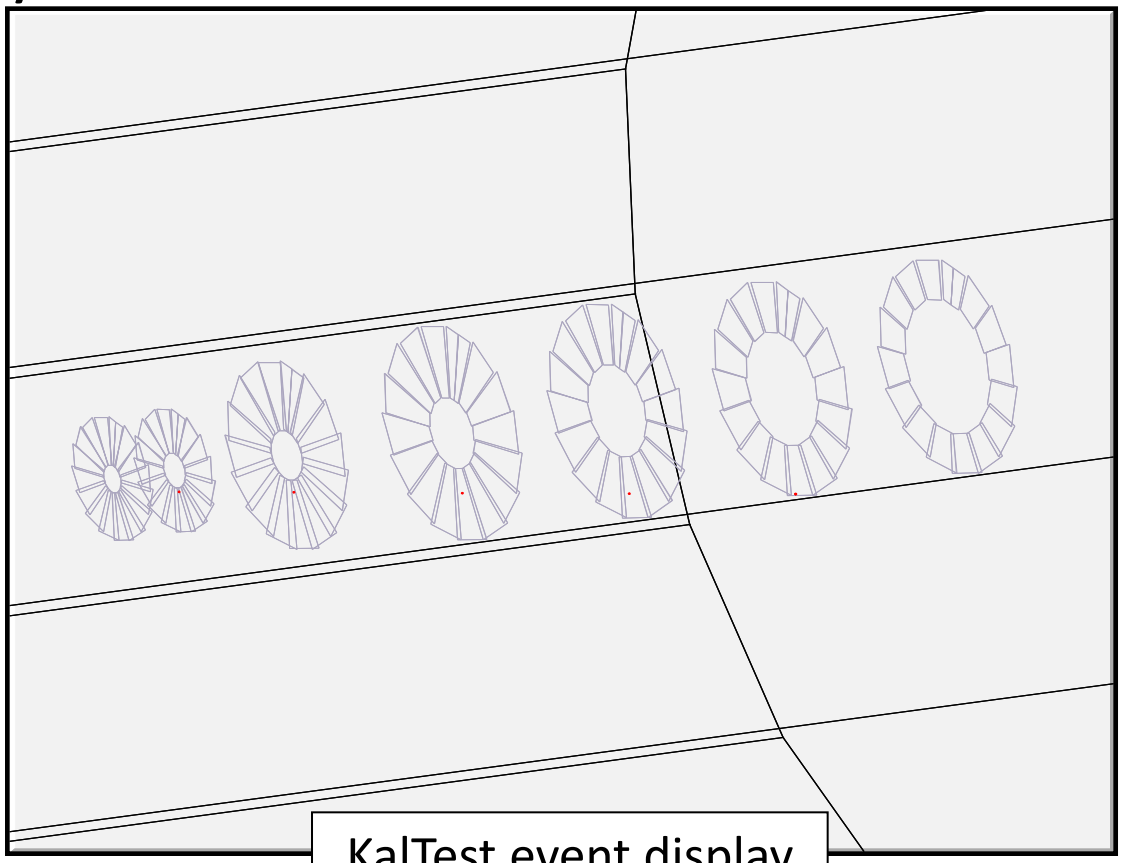


KalTest event display

Implementation of FTD into KalTest

- In example of KalTest, FTD is just a disk.

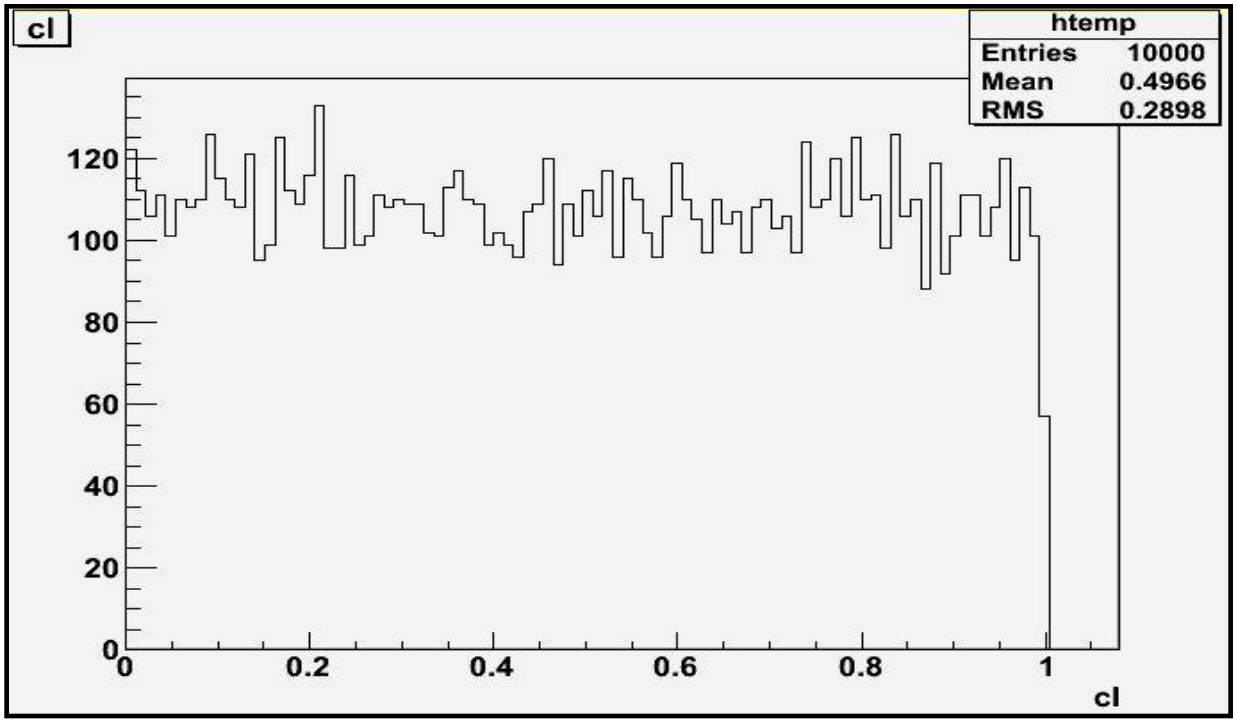
  → Modify into turbine-blade like FTD.



KalTest event display

Operation check

- Each hit points were smeared by gaussian, so the confidence level must be flat.



- Kalman filtering work correctly with detail geometry.
- Including multiple coulomb scattering and energy loss.

Summary/Plan

- We can implement detail geometry of detector into KalTest.

  Implemented

  - 3 doublet VTX
  - turbine-blade-like FTD

  https://svnsrv.desy.de/public/kaltest/KalTest/trunk KalTest

- Development of new silicon tracking processor will be started.
  - Taking advantage of double sided VTX.
  - Filtering method by using cluster shapes on FPCCD VTX.