

# Test beam software development

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## Outline

- online Data Quality Monitor
- offline EU Telescope software for DEPFET telescope
- DEPFET and EUDET integration
- Plans for Test beam 2009

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# Online Data Quality Monitor

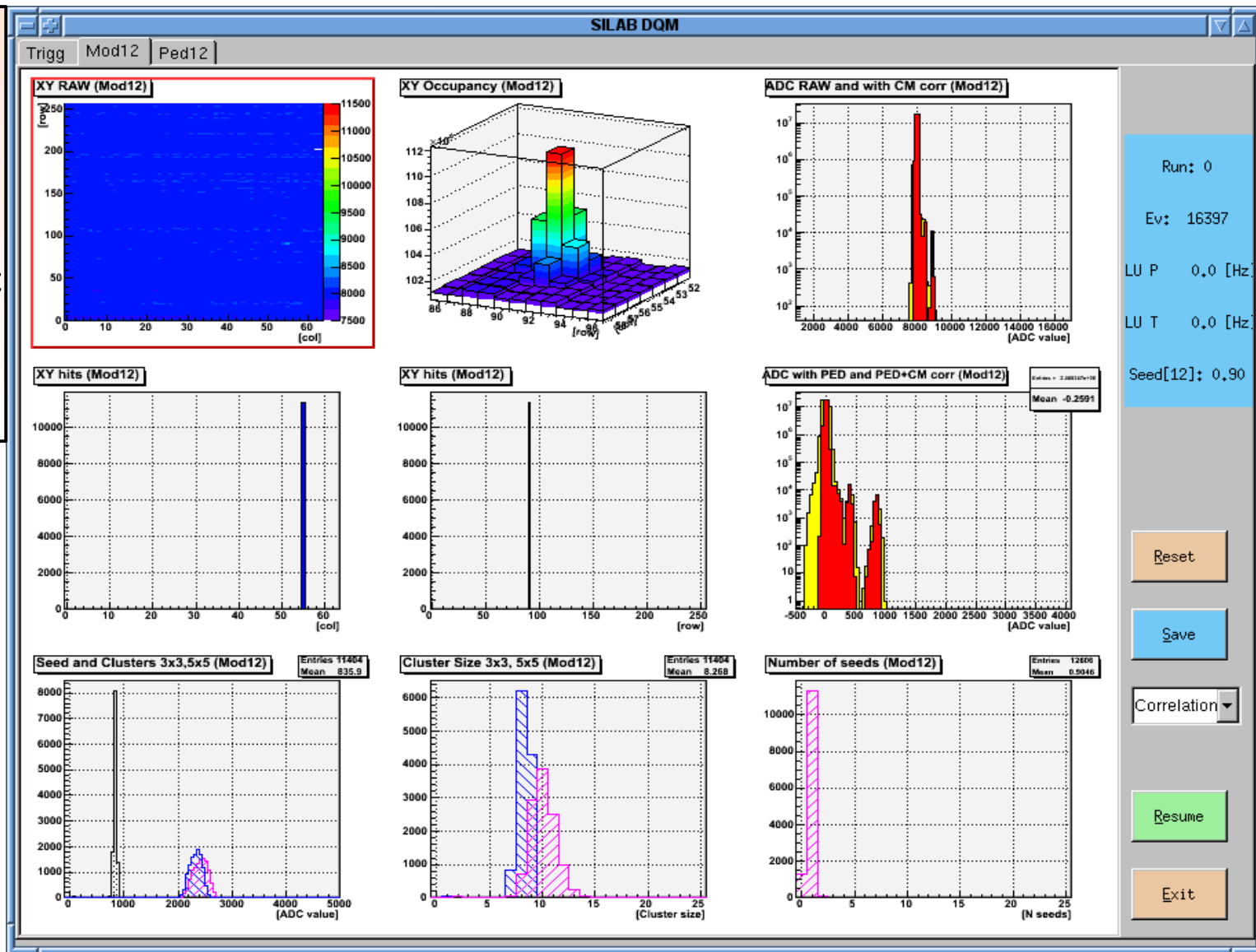
## Upgraded for use of NxM matrixes.

Changes in the file format for the 64x256 matrixes:

DeviceType=0x3;  
no more col and row info;  
only startgate and ADC;

Mode of operating:

1. from File
2. via TCP/IP
3. from shared mem.
4. without graphics, as ROOT TCP/IP histogram server



# EuTelescope software

Eutelescope: applications for the Test Beam

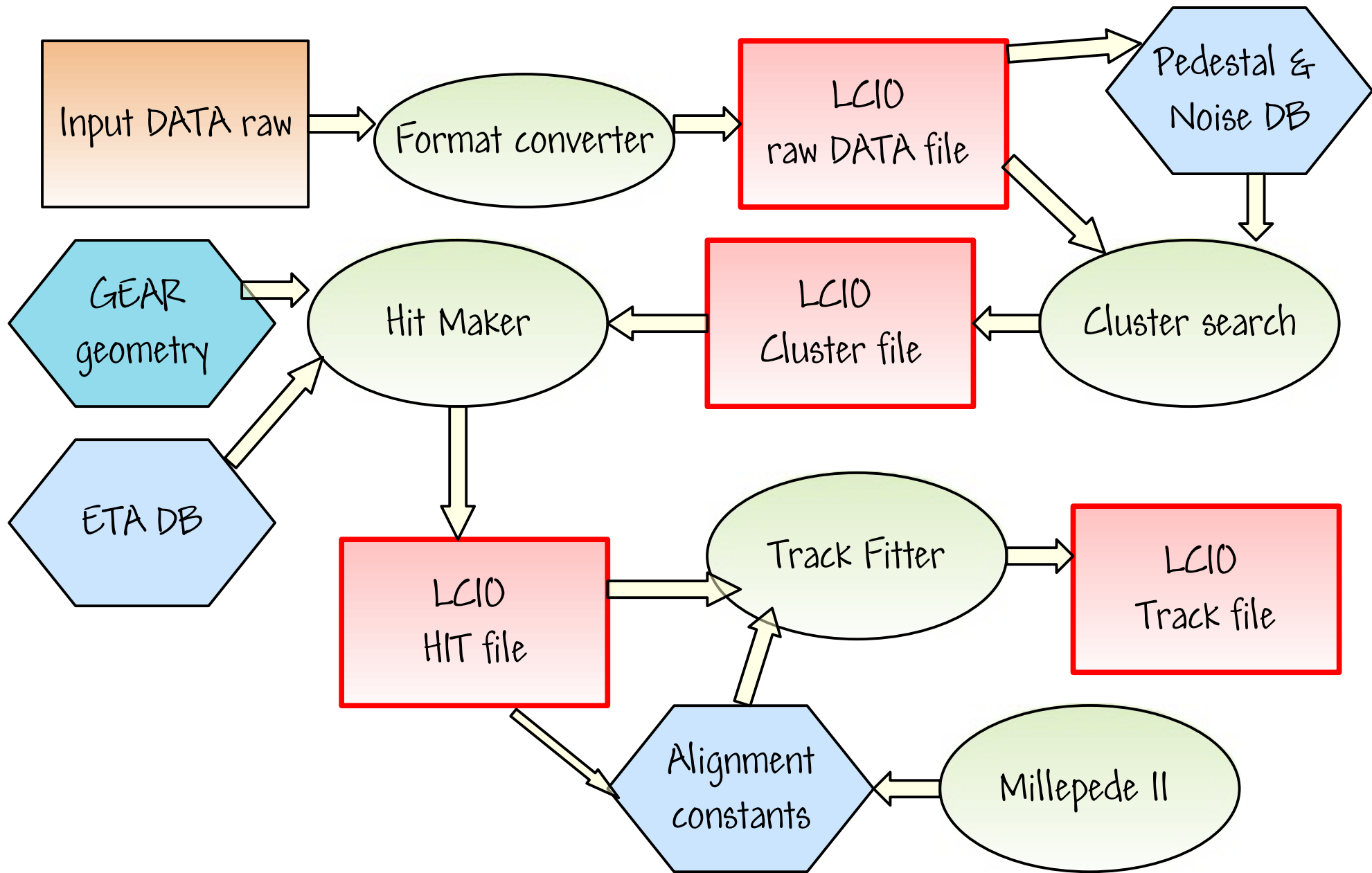
## Advantages of the ILC software:

- standard analysis tools and reconstruction software
- space for own development
- integrated with GRID for data management and processing

Use the same software for DEPFET telescope and EUDET telescope+DEPFET DUT

- LCIO (Linear Collider I/O): persistency framework and data model that has been adopted as a standard by the international ILC community.
- MARLIN: C++ application framework
- GEAR: geometry description
- RAIDA: interface to ROOT

# An example of the analysis scheme (for Silicon detectors)



# Application of the EuTelescope software for DEPFET Telescope

- 1) DEPFET Reader: special processor to convert raw DEPFET data to LCIO
- 2) additional options in PedestalAndNoise and CalibrateEvent Processors  
(for Common Mode correction)
- 3) GEAR geometry and HitMaker were adapted for the DEPFET geometry.
- 4) Millepede-II as alignment for DEPFET Telescope

# Millepede alignment (Run 1277)

Before alignment

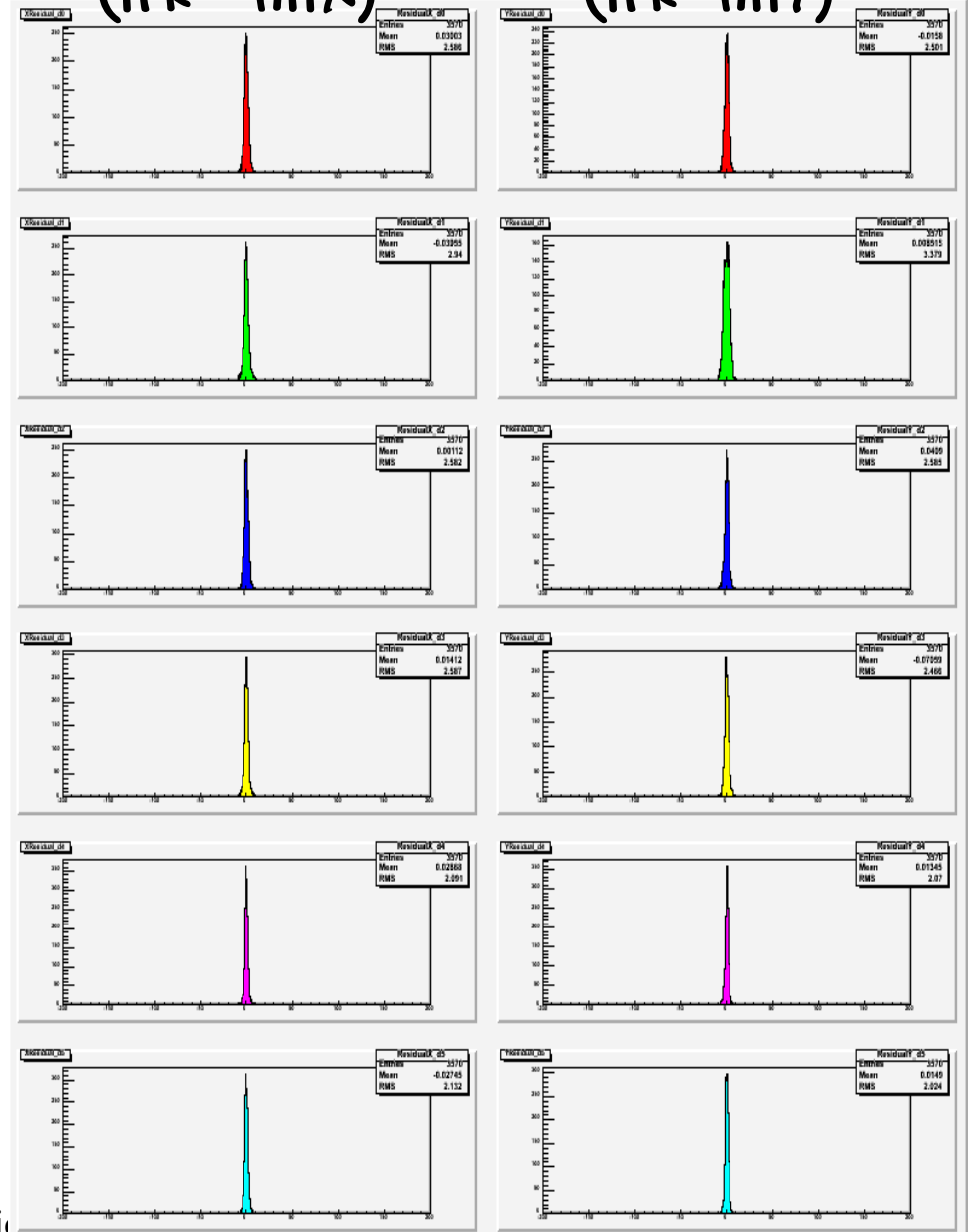
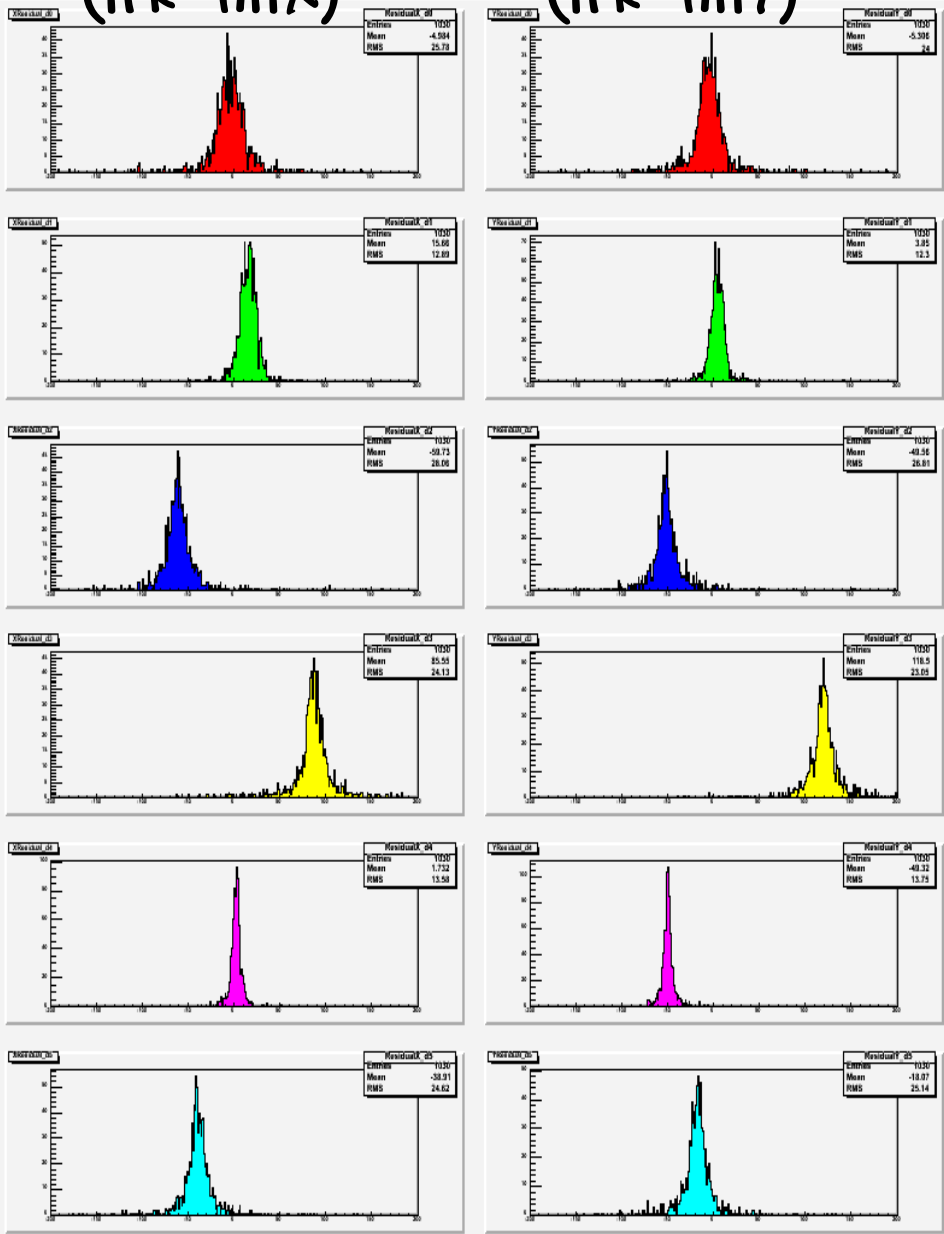
After alignment

(trk - hitX)

(trk - hitY)

(trk - hitX)

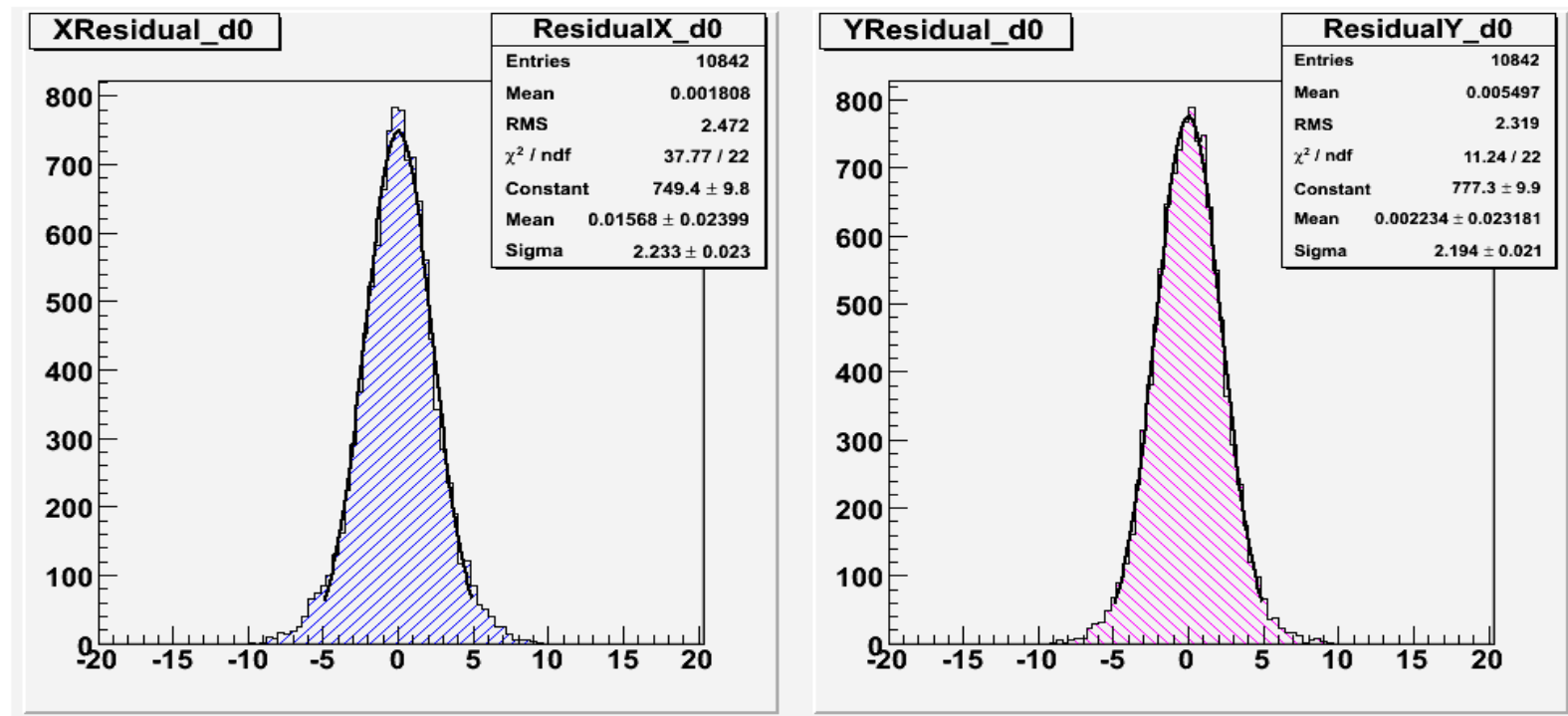
(trk - hitY)



ratio

# EuTelescope software for DEPFET Telescope

Residual distributions for S3A system



Modification of the DEPFET Reader Processor for the new DEPFET S3B system are done.

# EuTelescope software for EUDET Telescope +

## DEPFET DUT:

the real first combined analysis of the telescope and  
the "external" DUT

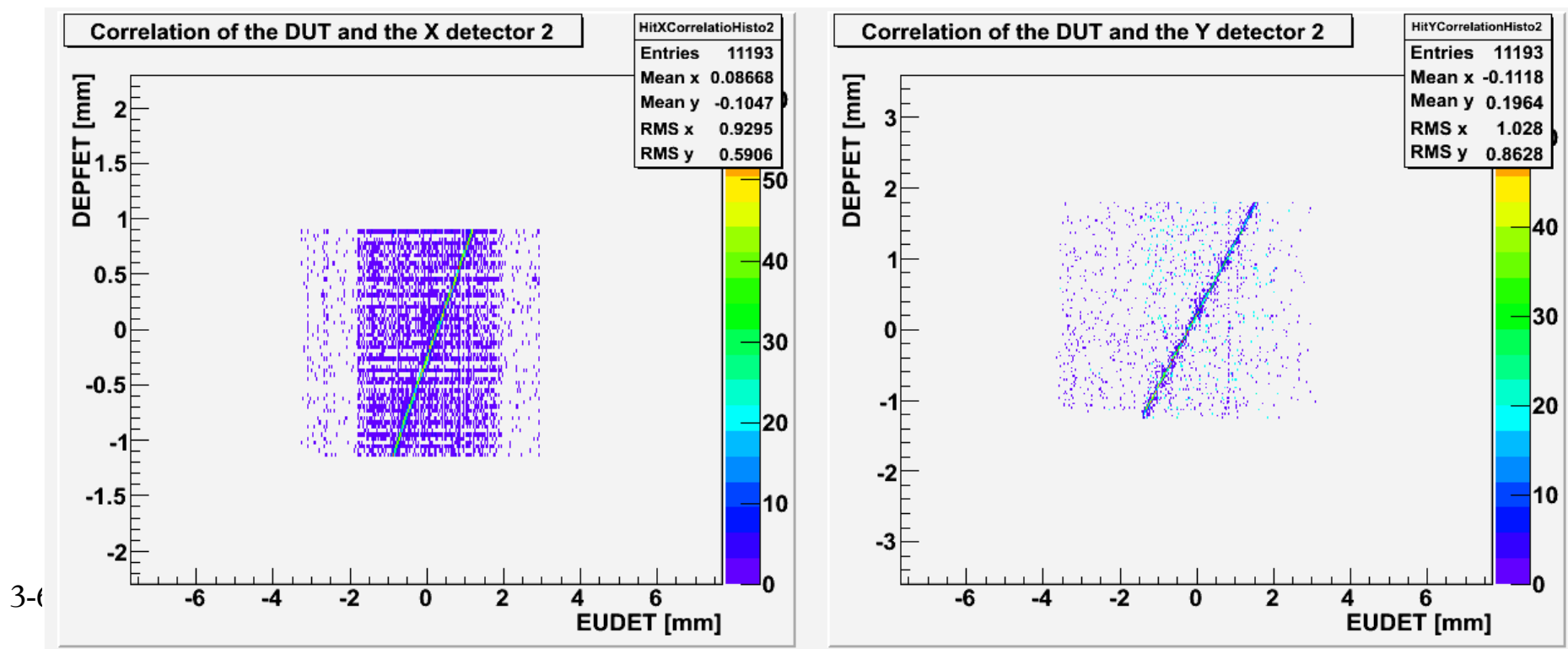
- 1) NativeReader ( for reading EUDET+DEPFET raw file) has been developed. DEPFET and EUDET decoding (col, row and ADC ) are done via EUDAQ software.
- 2) EUDET and DEPFET data have been processed independent up to the space points.
- 3) The local clusters in the DEPFET frame of reference have been converted into the EUDET Telescope frame of reference.



# EuTelescope software for EUDET Telescope + DEPFET DUT

4) EUDET telescope has been aligned and tracks have been reconstructed.

5) The evolution of the EUTelMille (alignment processor) is needed to be able to align the DEPFET and EUDET hits even they are coming from different collections.



# Conclusions

1. Online Data Quality Monitor is working now with the new S3B system  
(and also with combined system: S3A + S3B )
2. Offline EU Telescope software has been adapted for DEPFET, successfully used for the S3A system and will be used for S3B system.

.... and Plans



# Test beam 2009

1) Hybrids:

4+1(2) for DEPFET Telescope + 1 DUT for EUDET = 6(7)

a) assembling

b) characterization (Simone, Sergey, Robert, ...(?)) ...)

2) S3B boards.

3) mechanics: housing for S3B

4) new Power Supplies: 9

5) DAQ/software: 1-2 days workshop in Bonn

6) PC: 2 Linux (for DEPFET DAQ) + 2 Linux (for EUDET) +

1 Linux for RunControl + Ishtar (server for DATA storage)

1 Windows (table)

7) 7 x 1TB disks

8) Transportation