Analysis of Testbeam Data

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DESY
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DESY

Overview

- Test Beam Analysis Library
- Reconstruction and Analysis
- Calibration
- Field Distortions

Test Beam Analysis Library

Software package for

- First reconstruction and analysis of test beam data
- Developing code and fast testing based on root
- Classes can be used in Marlin processors for final analysis

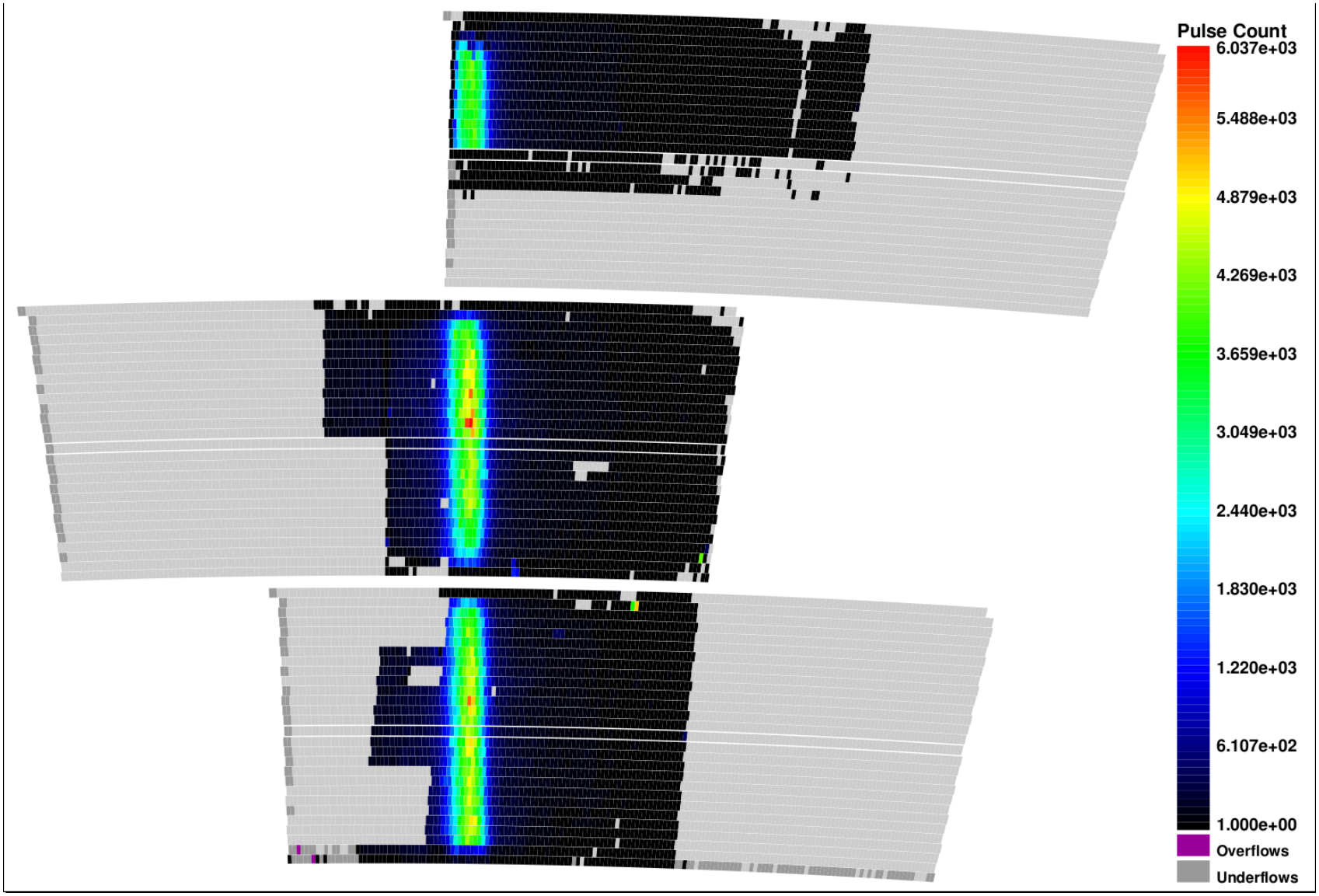
What it does

Generation of control plots for different steps of analysis

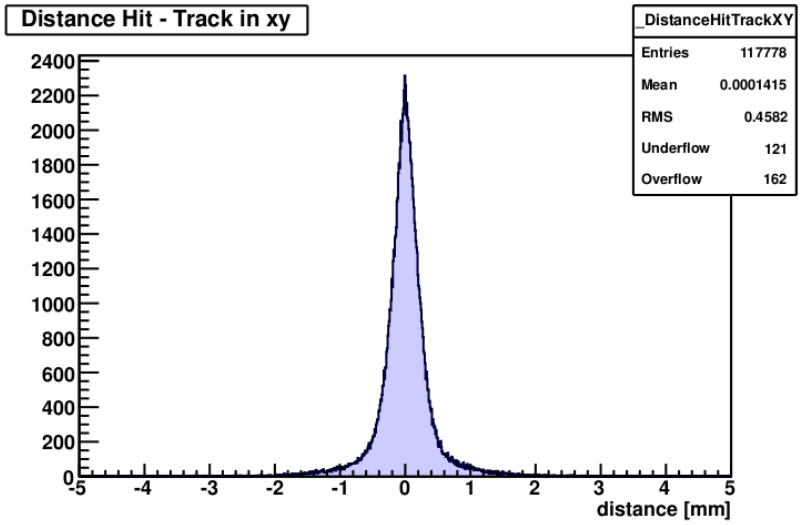
1. Raw data
2. Pedestals
3. Pulses
4. Hits
5. Tracks

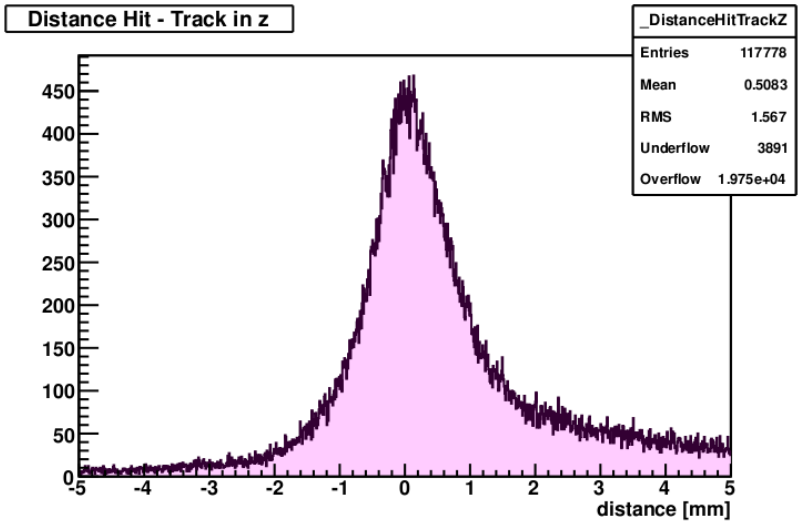
Data structure to be written into root trees for fast plot generation

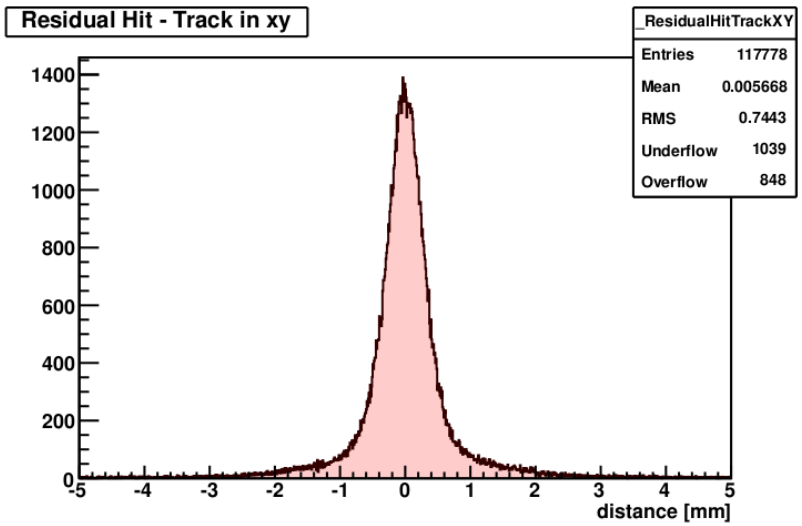
Example Plots

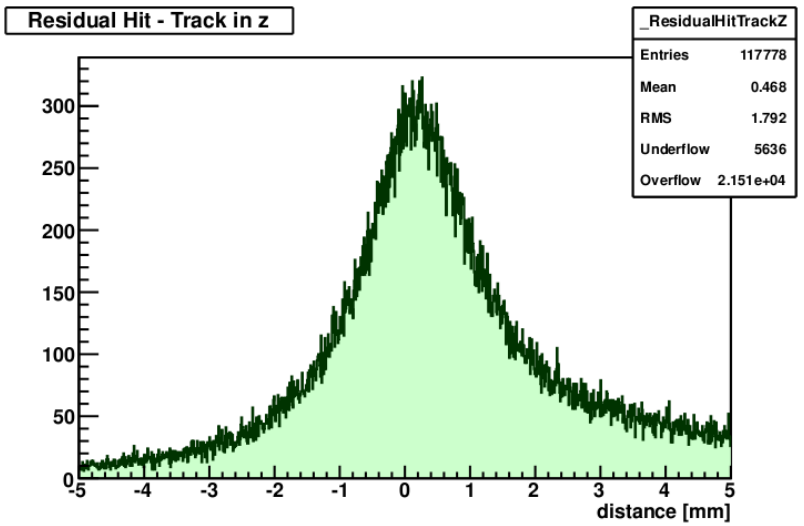


Example Plots

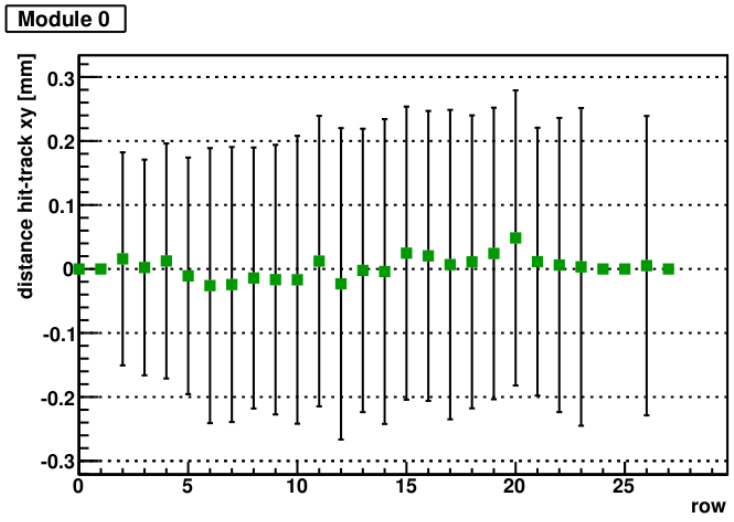


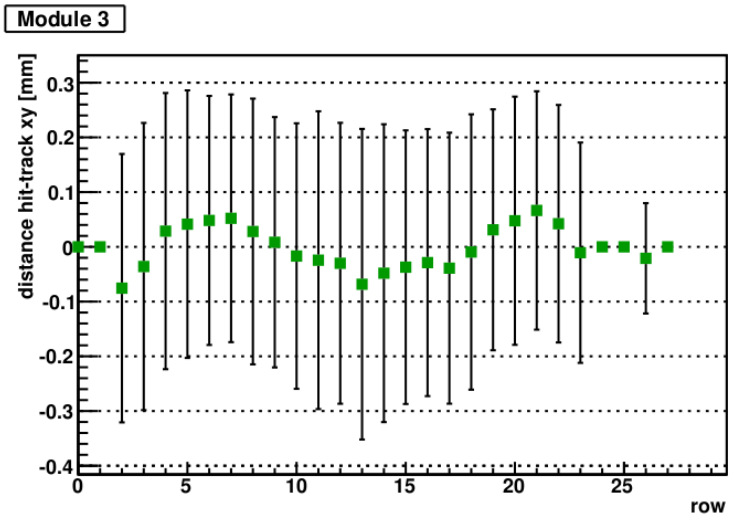


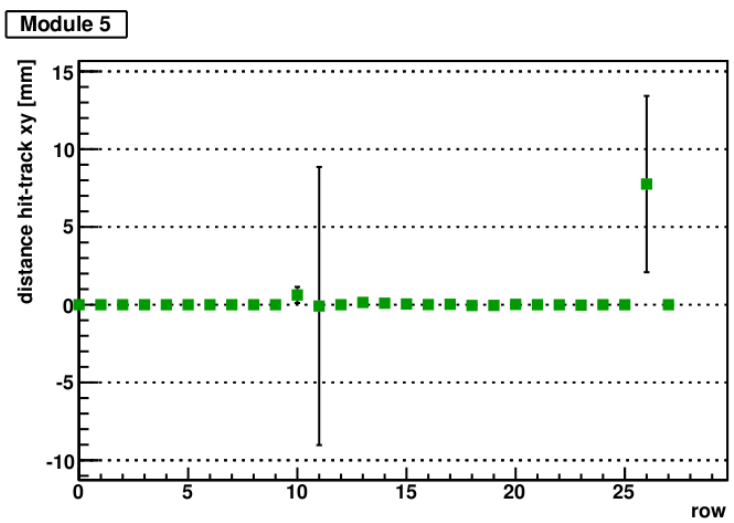




Example Plots







Reconstruction and Analysis: Methods

- Single point resolution without external reference
- Drift velocity and handling of offsets
- Determination of cathode and anode position from data

To Do:

- Agree on set of well defined methods.
- Share code (MarlinTPC).
- $\rightarrow$ Cross check results between groups.

Calibration and Field Distortions

Calibration

- Electronics and gain of MPGD

→ Necessary for uniformity studies

Distortions form E and B fields

- Understanding the systematics
- How to correct for it?
  - Correction based on data itself
  - Use parametrisation
  - Prediction from field maps

Alignment

For the moment only between modules.
How precise doe we know the module position?
Should we allow alignment of modules based on data? (probably not)

Common Analysis

Make available on the grid:

1. Raw data
2. Converted data (lcio)
3. Gear file

Put into data base:

1. Electronics parameter
2. Channel mapping
3. Conditions data if available

Use MarlinTPC to develop code!