The Si-Detector Beam Test @ COSY

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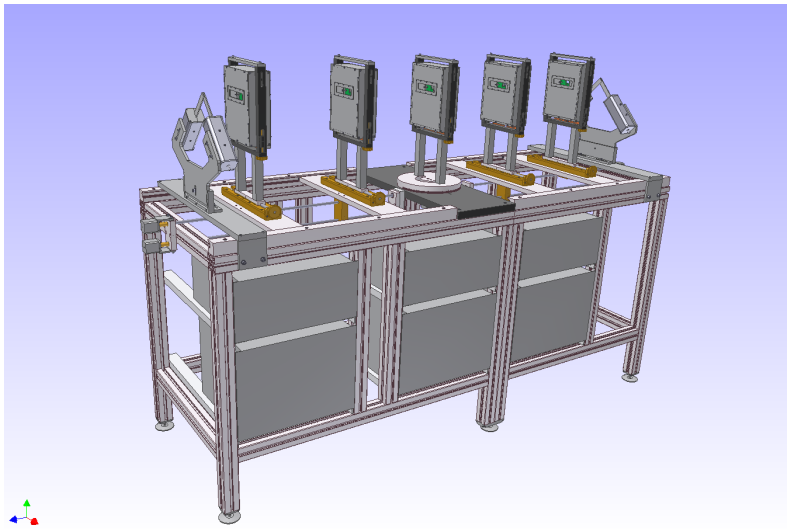
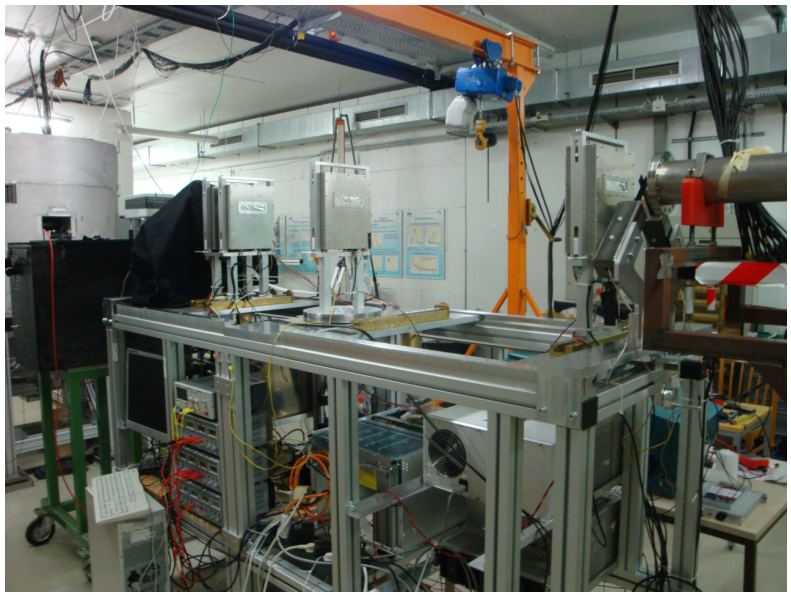
Tracking Prototype



- up to 5 sensitive layers at freely adjustable x-y-z-positions
- box on turntable may be removed for study of scattering of arbitrary absorbers

beam setup@COSY (Jülich) in first week of February



- measurements with different:
  - beam momenta
  - sensor rotations
  - absorbers

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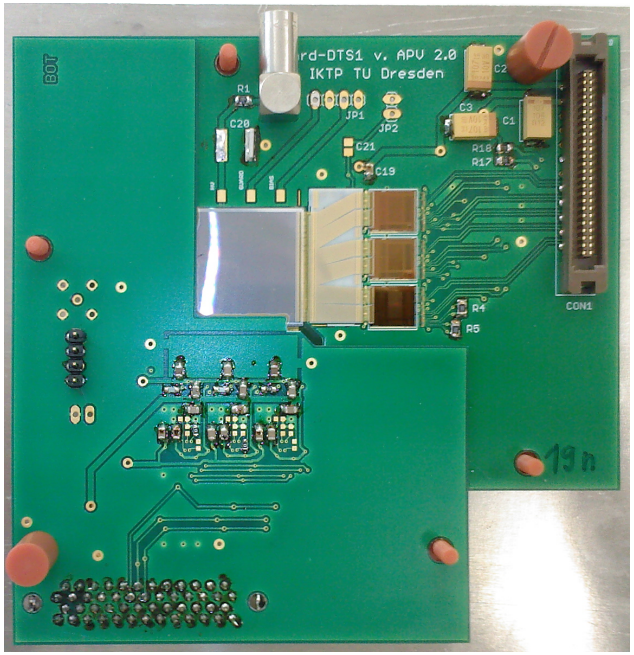
Setup



- prototype sensor modules
- 2x2 cm^2, 50μm pitch, 300 μm thickness
- 3 APV25 Frontends / sensor side
- mounted in lightproof box

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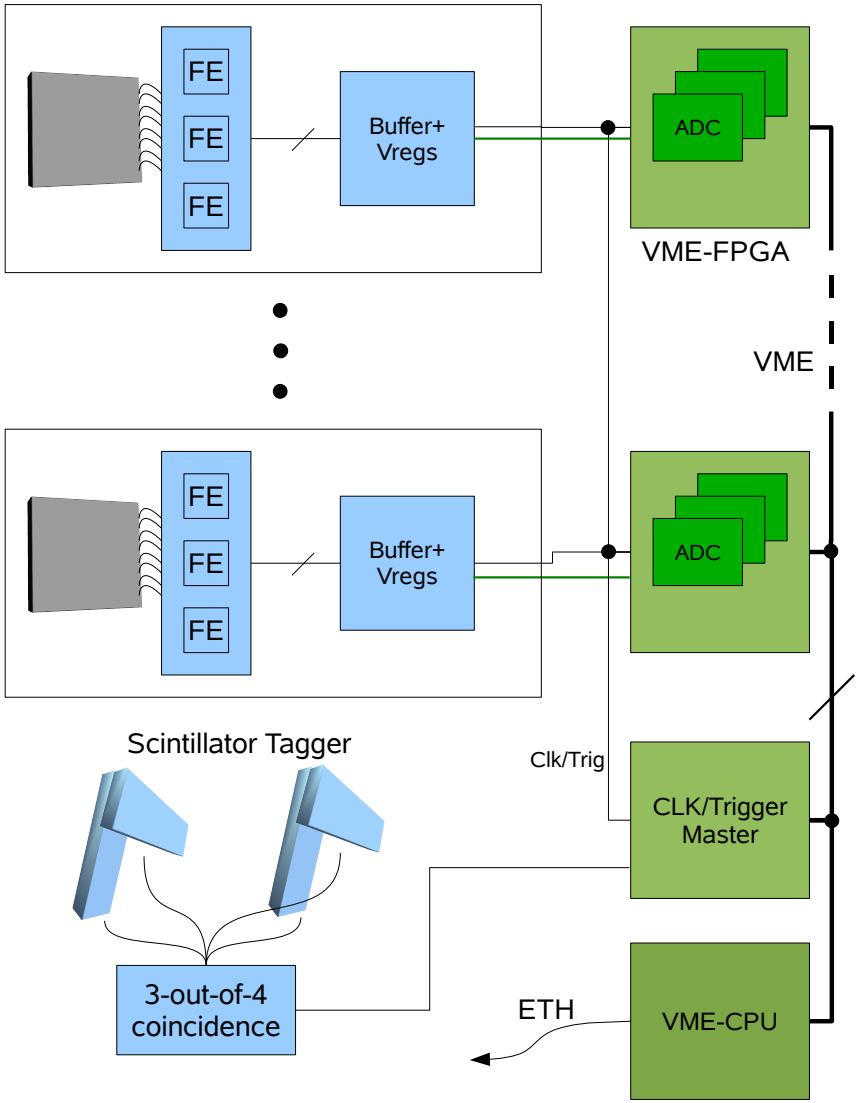
Setup



- 3 Frontends / single sided sensor
- 6 Frontends / double sided sensor
- total 24 Frontends
- VME-FPGA-Boards with ADC-Daughtercards
- Zero-Suppression, Pedestalcorrection, Hit- and Clusterfinder in FPGA-Firmware

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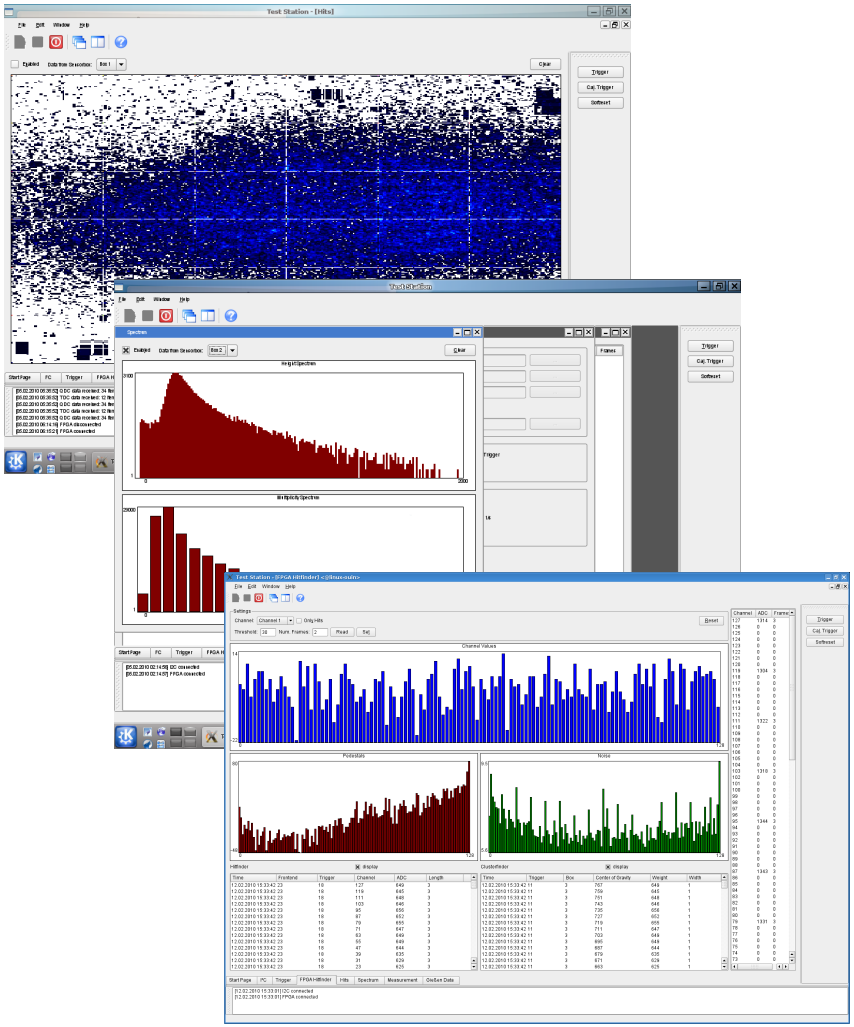
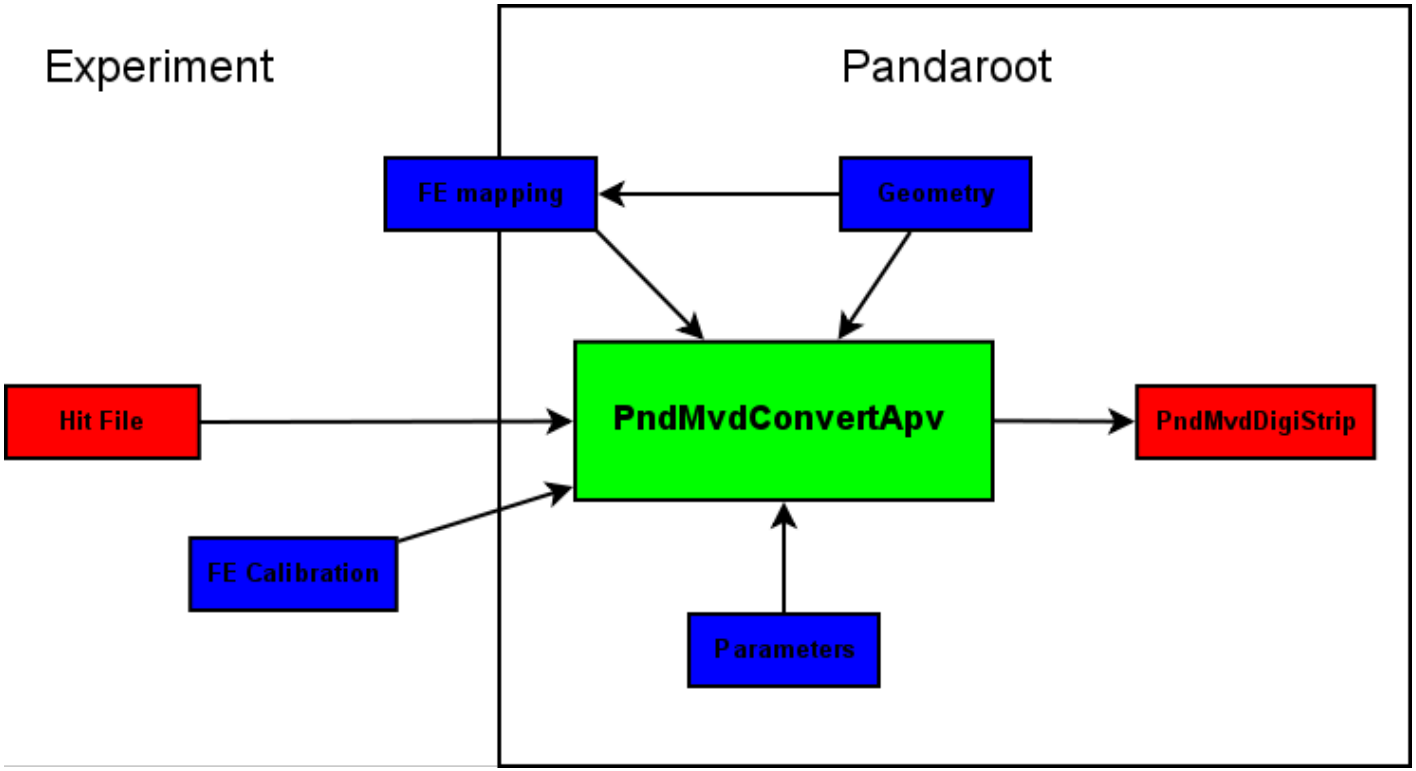
Beam Test

- 6 sensors, 24 Frontends
- online Zero Suppression + Hit- and Clusterfinder (on VME-FPGA-Modules)
- 85 Million events (=tracks) recorded in 3 nights
- avg. daq rate: $1.2 kevents \cdot s^{-1}$

Online Monitor



PANDARoot Interface



- interface of real data to Pandaroot Digis with correct detname
- provides generation of a channel/frontend mapping from the geometry which is editable by the user

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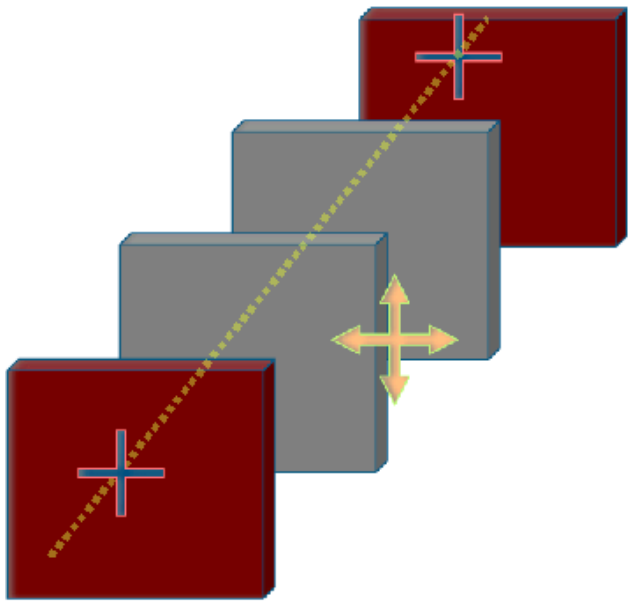
Alignment

- Alignment of sensors optically during set up
- further alignment done in off line analysis



- definition of straight track by first and last sensor
- plot of residuals in inner sensors

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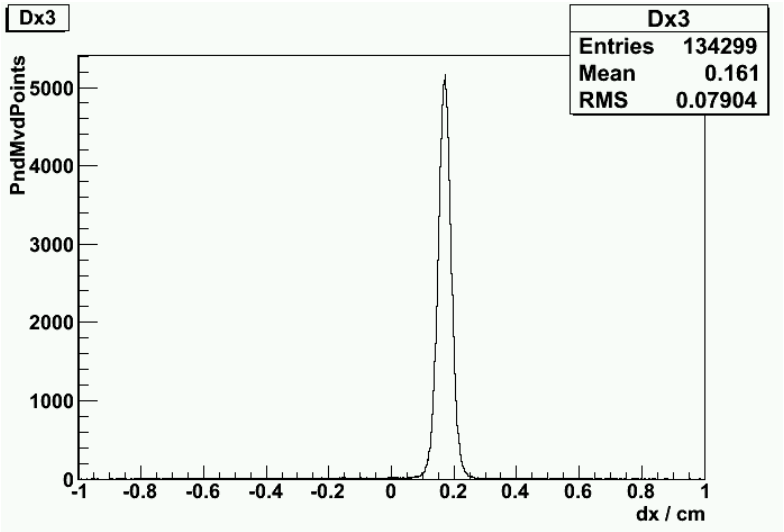
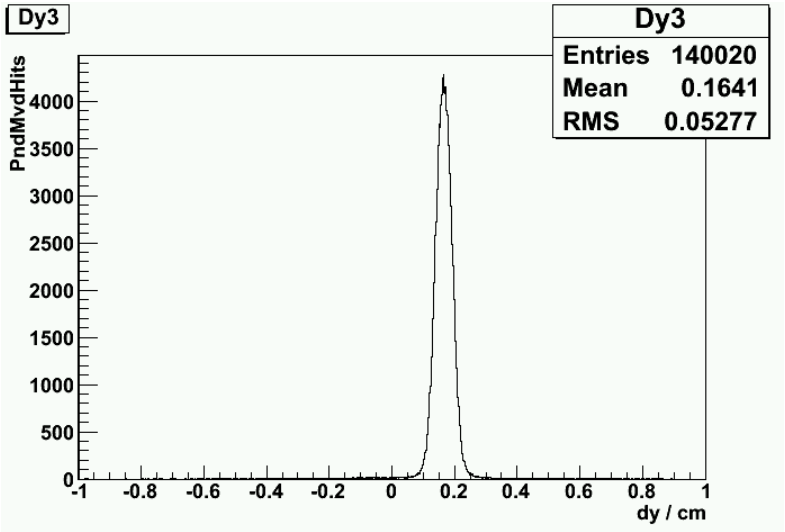
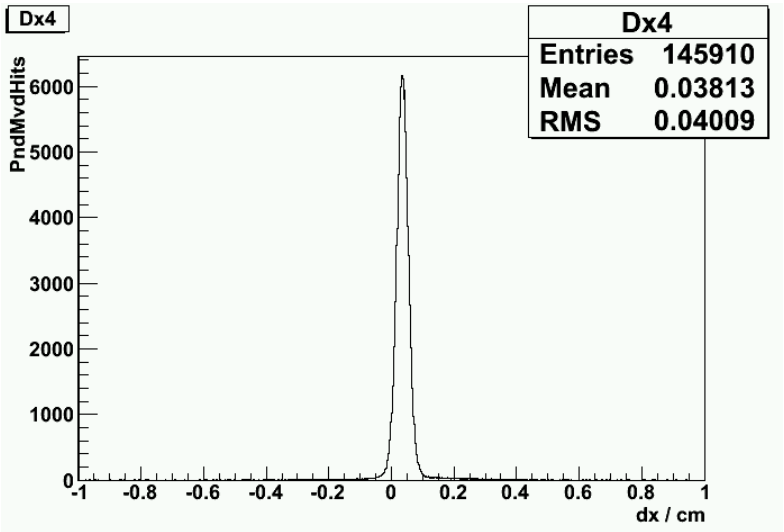
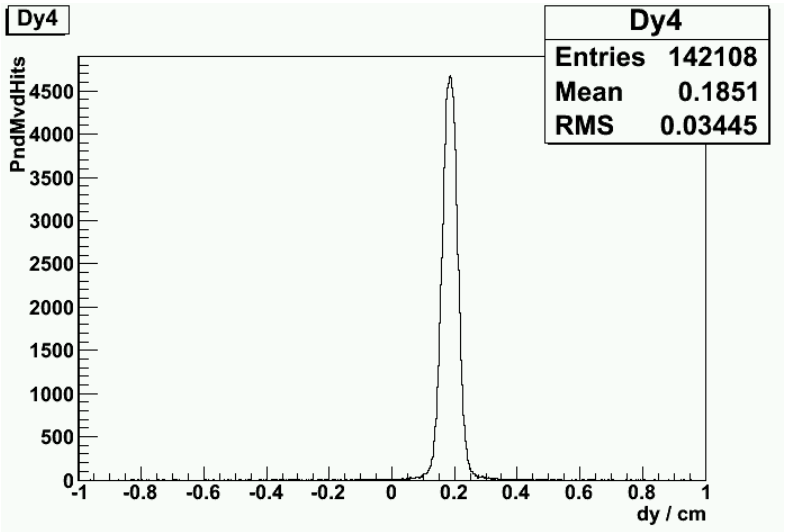
Residuals before Alignment









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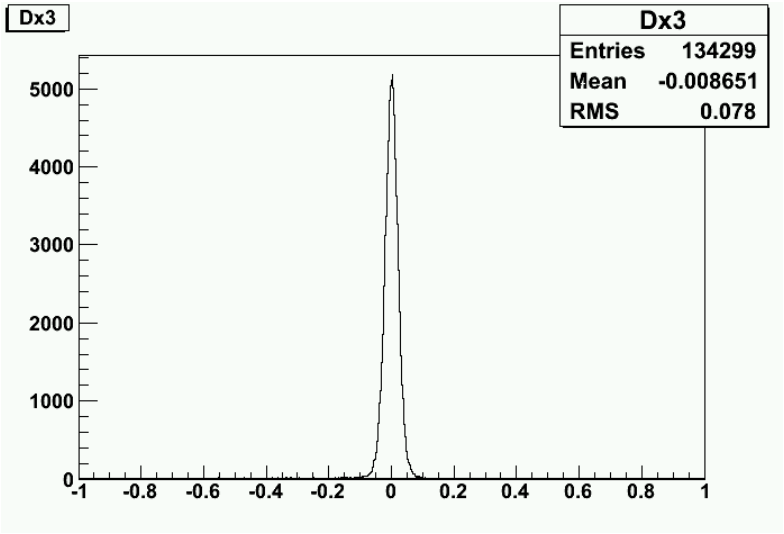
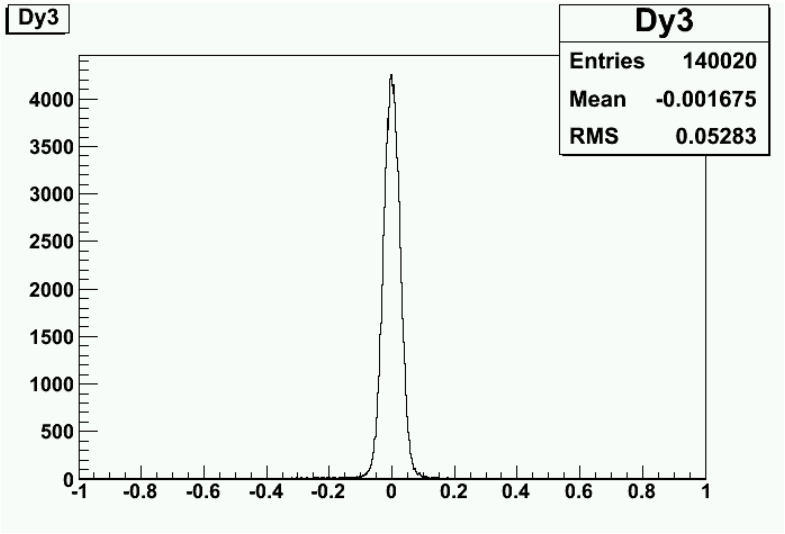
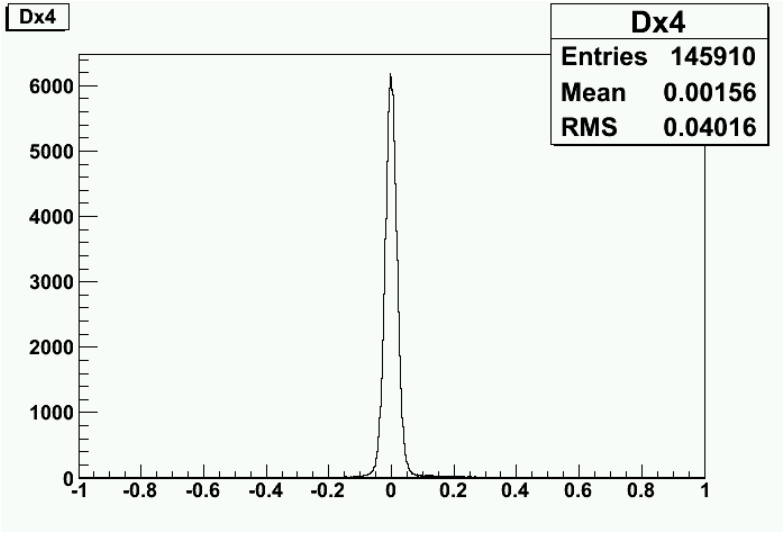
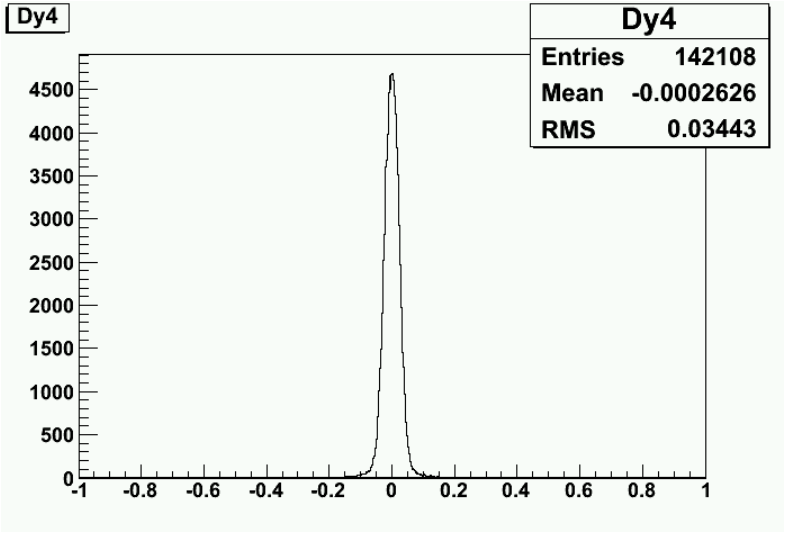
Residuals after Alignment









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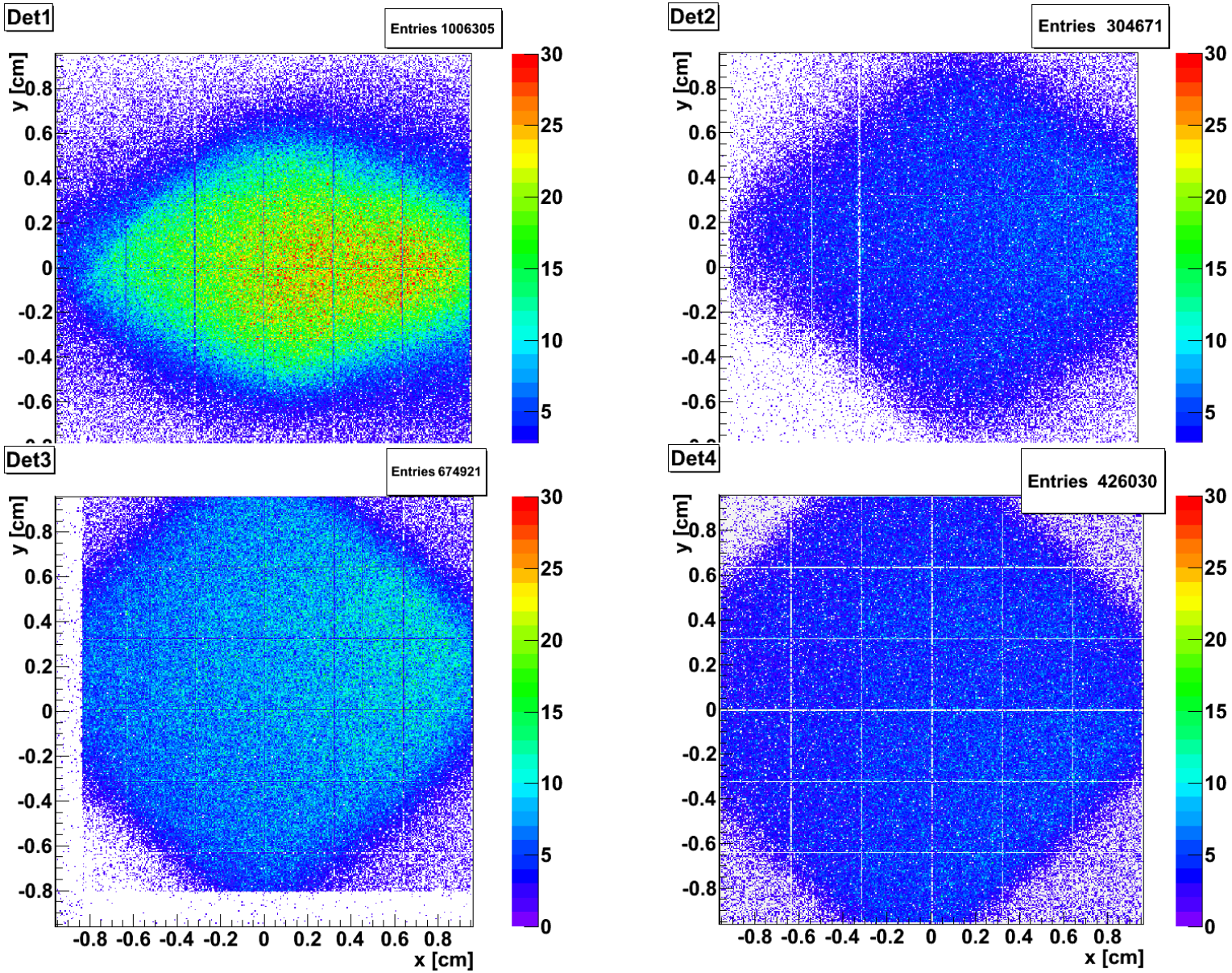
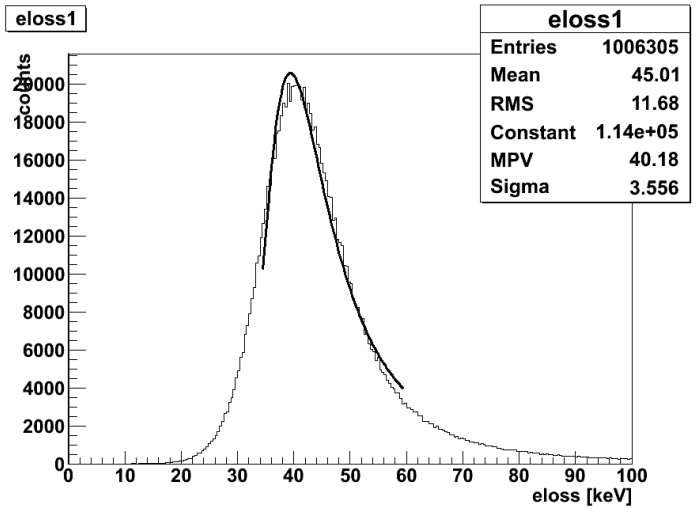
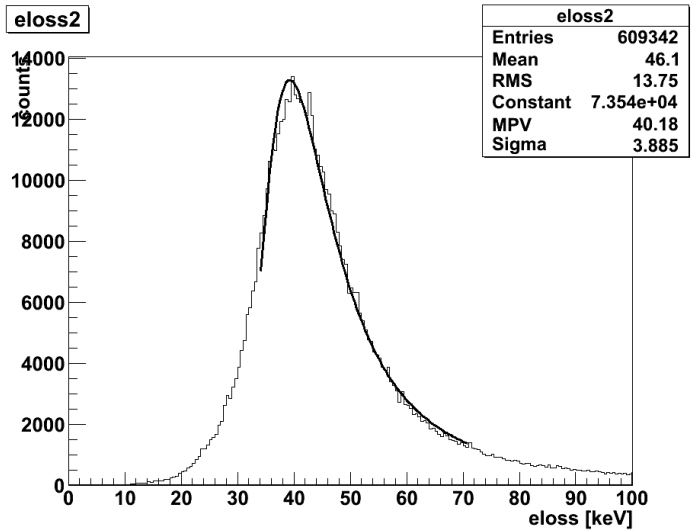
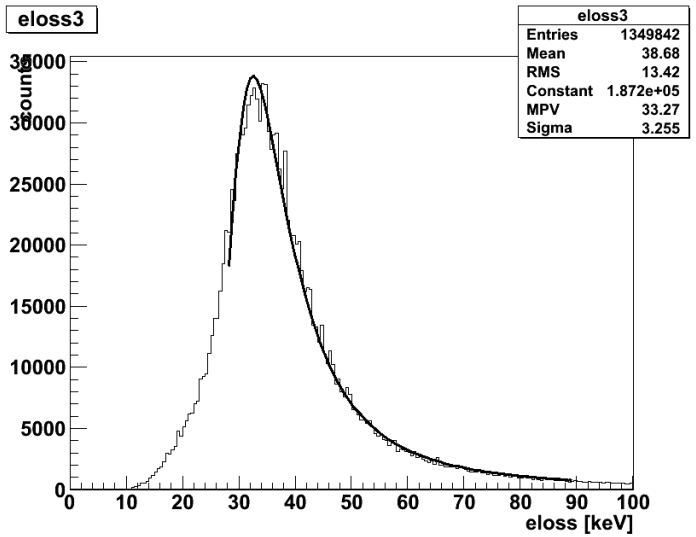
Hit Distributions @ 2.95 GeV/c

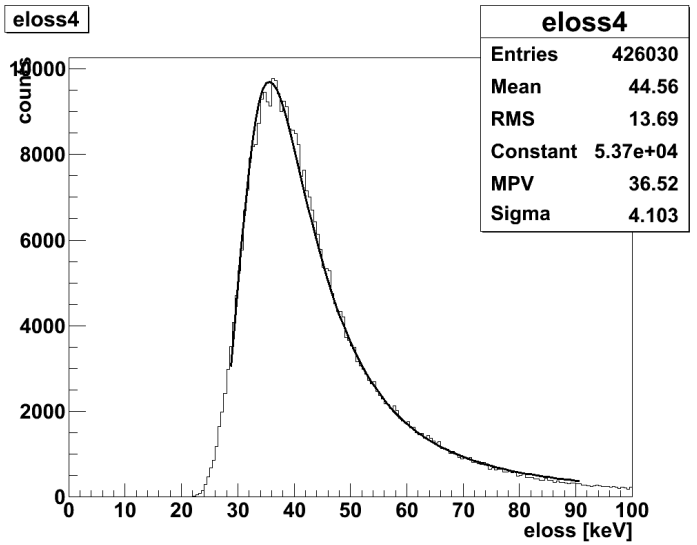


Energy Loss Distributions @ 2.95 GeV/c









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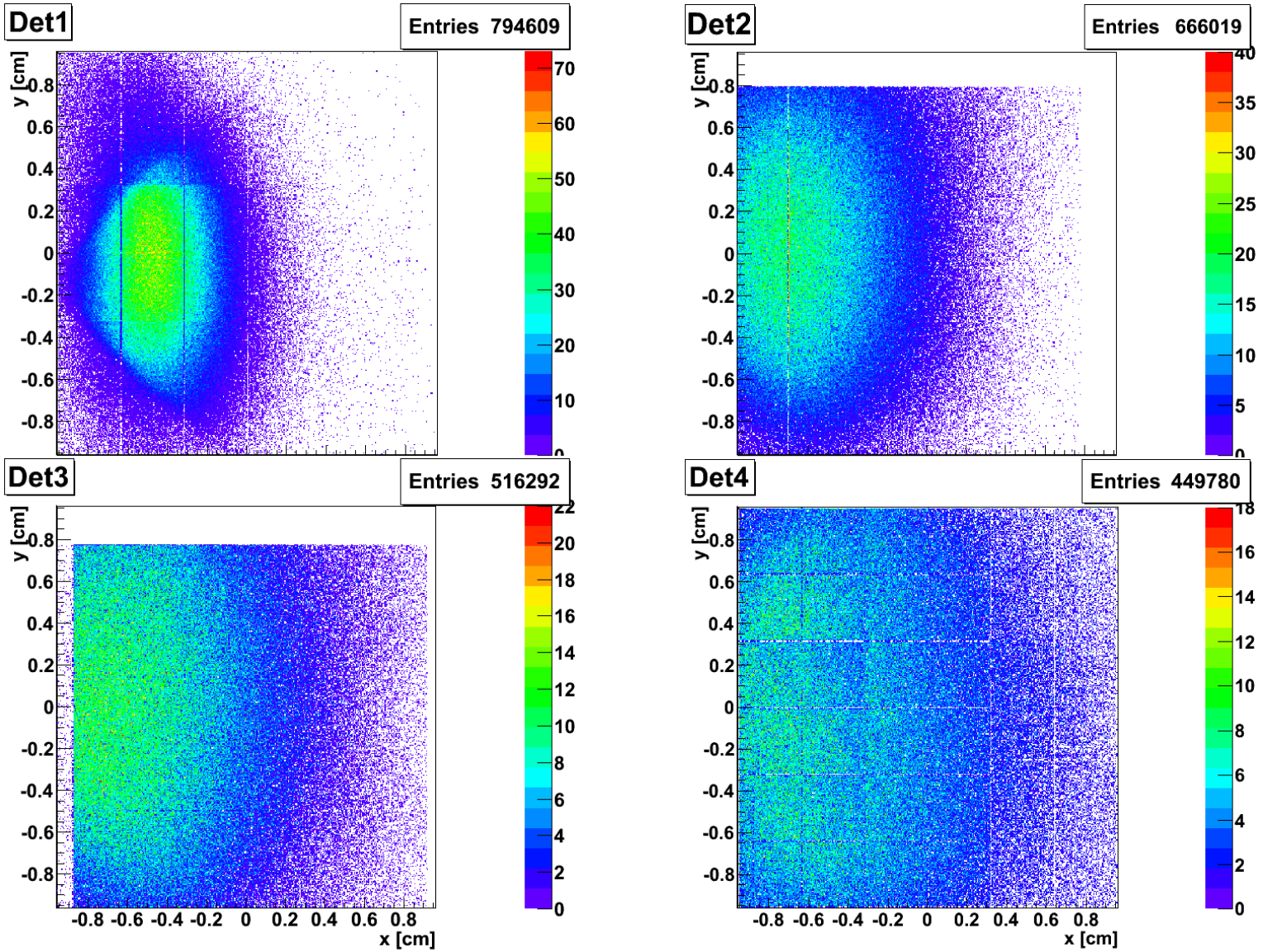
Hit Distributions @ 893Mev/c



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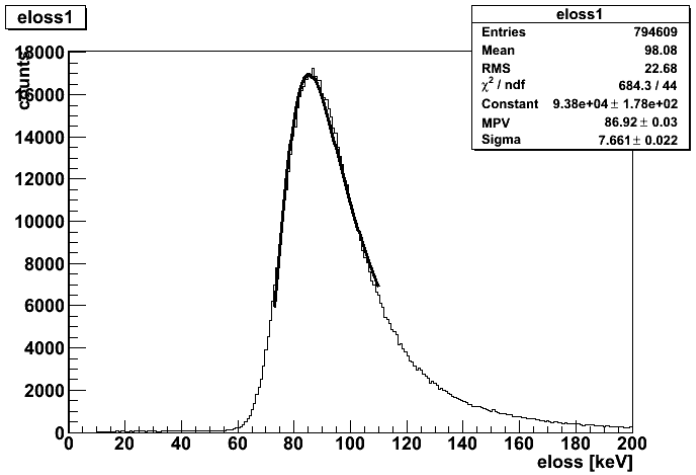
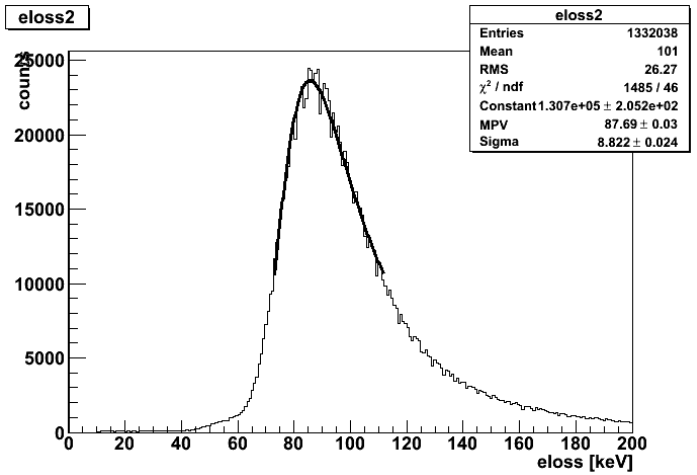
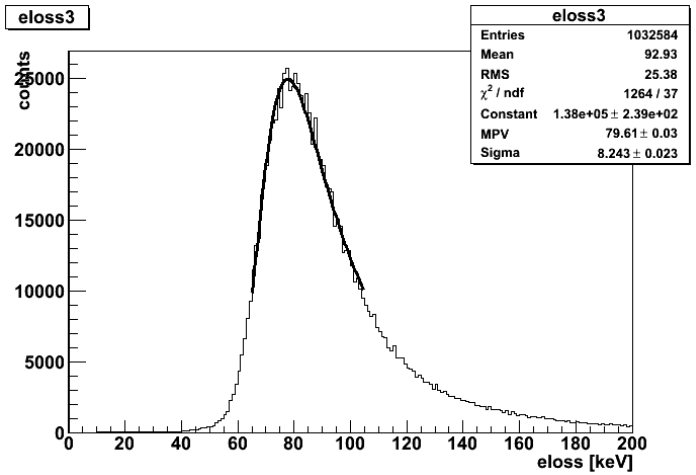
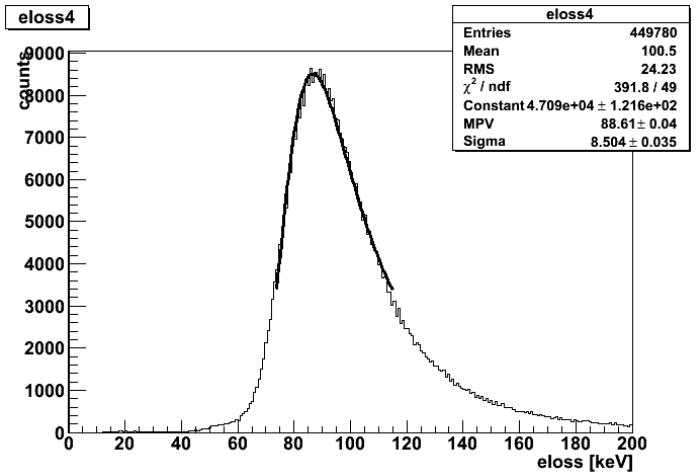
Energy Loss Distributions @ 893 MeV/c









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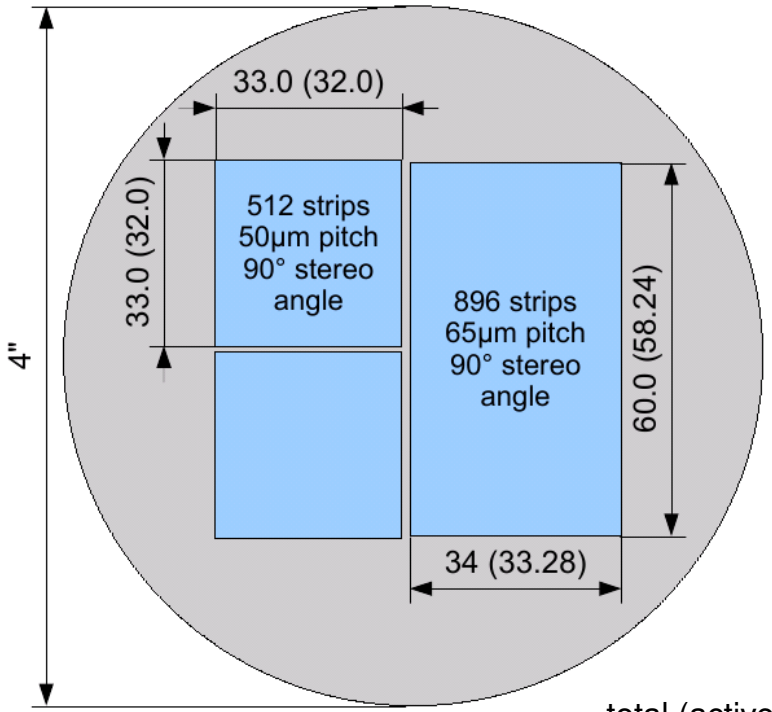
Prototype Strip Sensors

- prototype run for PANDA-sized sensors under preparation
- submission in the next time at CIS (Erfurt)



total (active) dimensions in mm

- thickness 300μm

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