

T₁₀ Testbeam update TORCH & beam studies

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ENGINEERING
DEPARTMENT

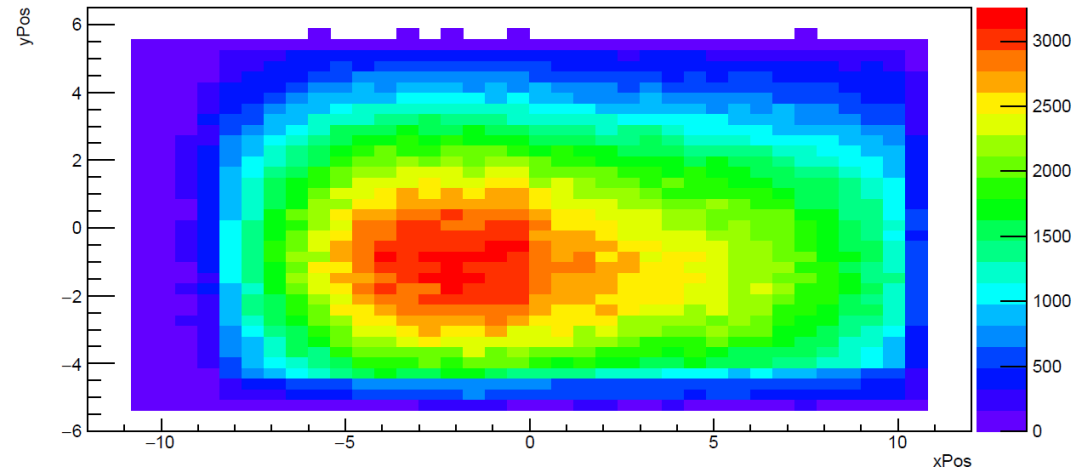
Testbeam in T10

- Data taking in T10 – various goals:
 - Beam studies
 - Telescope hardware upgrade
 - TORCH synchronization testing
 - Eventual goal: use the AIDA telescope with the full TORCH setup (Nov. 2017)
- Key elements
 - AIDA telescope (Azalea)
 - Trigger Logic Unit
- Preliminary results – data processing ongoing

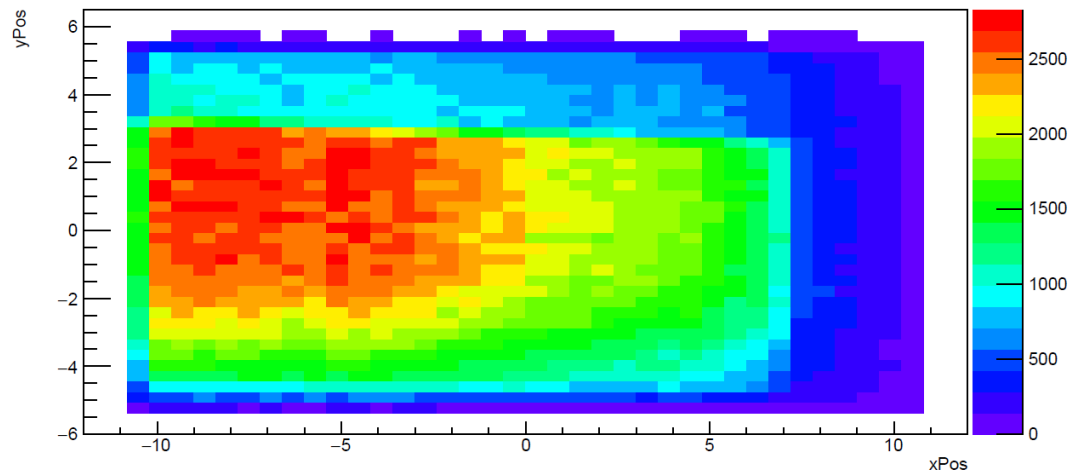
Telescope data

- AIDA telescope
 - Six Mimosaz26 sensor planes
 - Two double scintillators upstream and downstream
 - Data taking with EUDAQ software
 - Reconstruction using EUTelescope
- Display shows tracks found after alignment and fitting
 - Alignment of telescope not perfect, several mm off in both planes

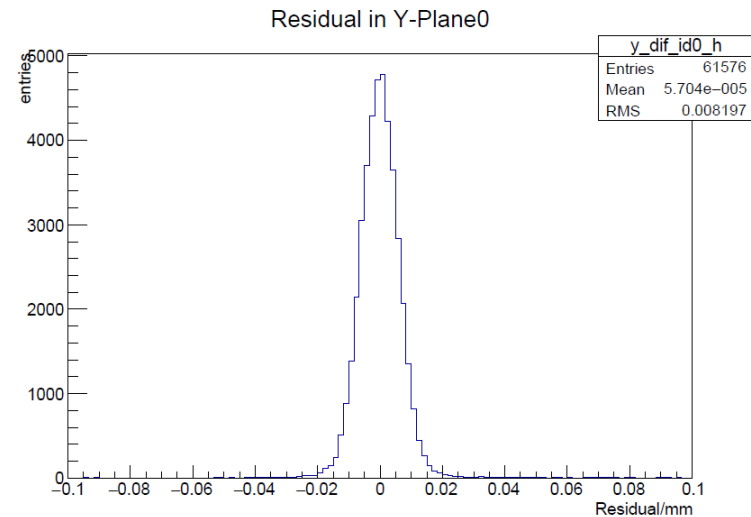
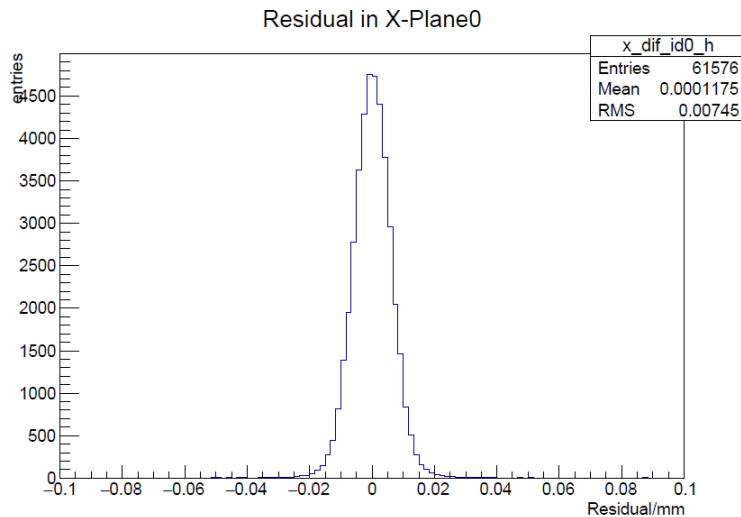
Beamspot on upstream telescope plane



Beamspot on downstream telescope plane



Residual distributions



- Created tuples currently under study by M. Bergmann (summer student)
- Good results so far
 - Fitted standard deviation of $5.95 \mu\text{m}$
 - Minimum expected from pixel size: $5.31 \mu\text{m}$
- Work ongoing

Telescope hardware upgrade

- One of the main goals of the testbeam was to outfit the telescope with a new Trigger Logic Unit
 - Takes in pulses from scintillators (and other devices)
 - Defines and hands out trigger signals
- Upgrade required because current TLU not compatible with TORCH electronics
 - New TLU was used in addition to old TLU (D. Cussans, University of Bristol)
 - Triggers handed out by old TLU passed on to new TLU passed on to TORCH electronics
 - Eventual goal: replace old TLU fully
- Multiple datasets recorded with TORCH electronics and telescope simultaneously

Conclusions

- Successful beamtest in T10
 - Used telescope to study beam
 - Preliminary results look good, more forthcoming

- New hardware was tested
 - New TLU was run in tandem with old TLU
 - Simultaneous datasets have been taken
 - Synchronization under study

- A heartfelt thank-you to André Rummler