WP4
Calorimeter Software
State of art

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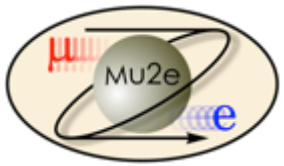
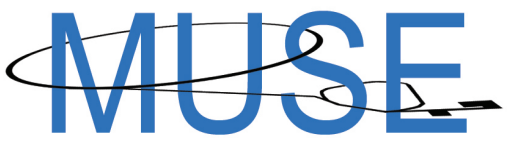
MUSE "Merry-Xmas" meeting

December 20, 2018

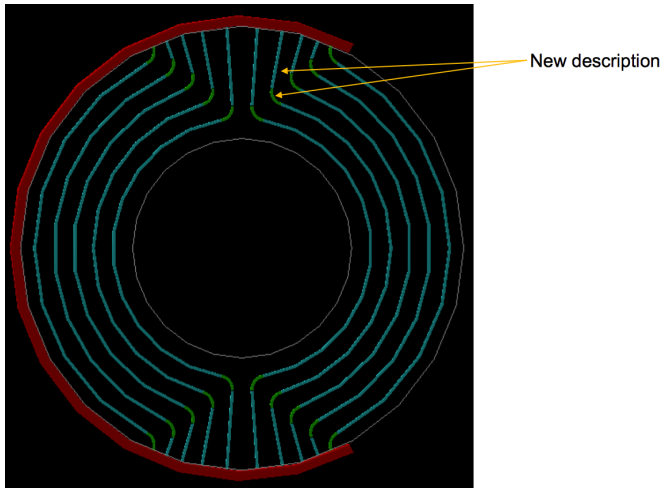




Calo-software updates

- Geometry
- Output digitization → bug fixed
  - Partcicle with same Id were overwritten
- CR trigger used as starting filter for calibration purpose
  - Algorithm in development phase
- MDC 2018

Calo-geometry



Front plate:

- Carbon fiber thickness reduced to 1.5 mm
- Better description of the calibration source pipes

Central section:

- Inner step description fixed
- Added Al foam between the steps and the inner ring
- Added support rings inside inner ring
- Crystals are placed in a bath of Tyvek to model shimming material
- Added plastic cap/frame in front of crystals
- Removed frame at back of the crystal to speed up calculation, but correct crystal z position
- Fixed length of inner / outer steps

Back plate unchanged, but several dimensions need to be confirmed (more later)

Main tasks – MDC 2018

Specific goals:

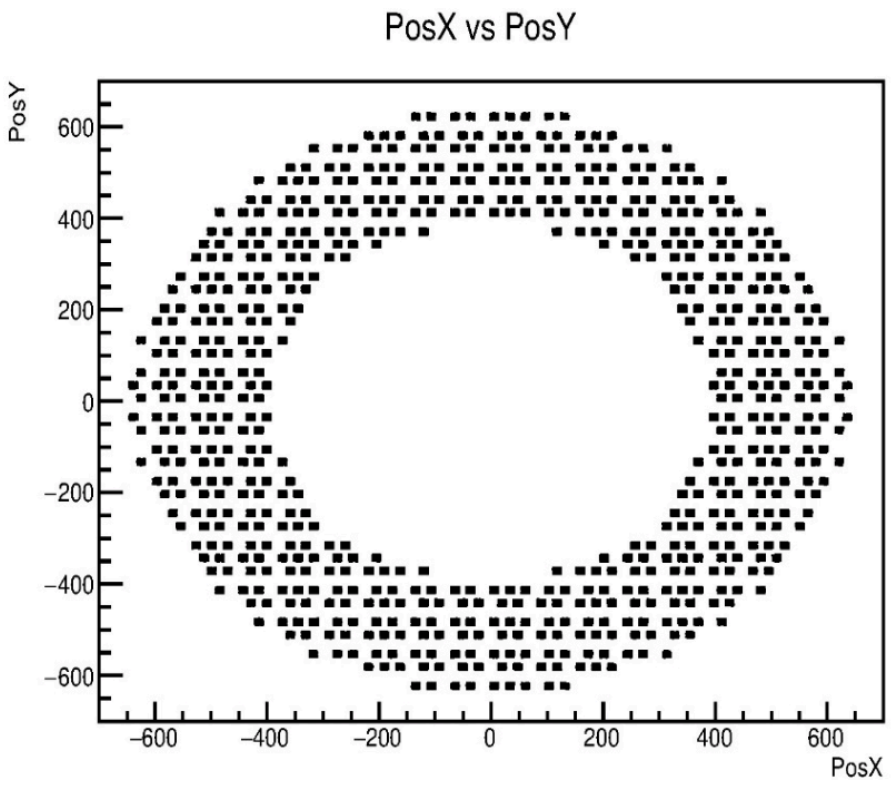
- Explore/Exploit improved simulation realism
  - geometry, detector response, data formats ...
  - effect of mis-alignment and calibration on reconstruction
- Systems Integration and methodologies
  - Tracker + Calorimeter + CRV in one data-stream
  - Incorporate 'trigger' in processing path
  - Job management, code validation, data processing workflows...
  - Prepare for future (yearly) data challenges
- Provide new standard simulation samples for:
  - Trigger algorithm development and testing
  - Development of in-situ calibration techniques
  - Tutorials and training
  - Mock Data analysis

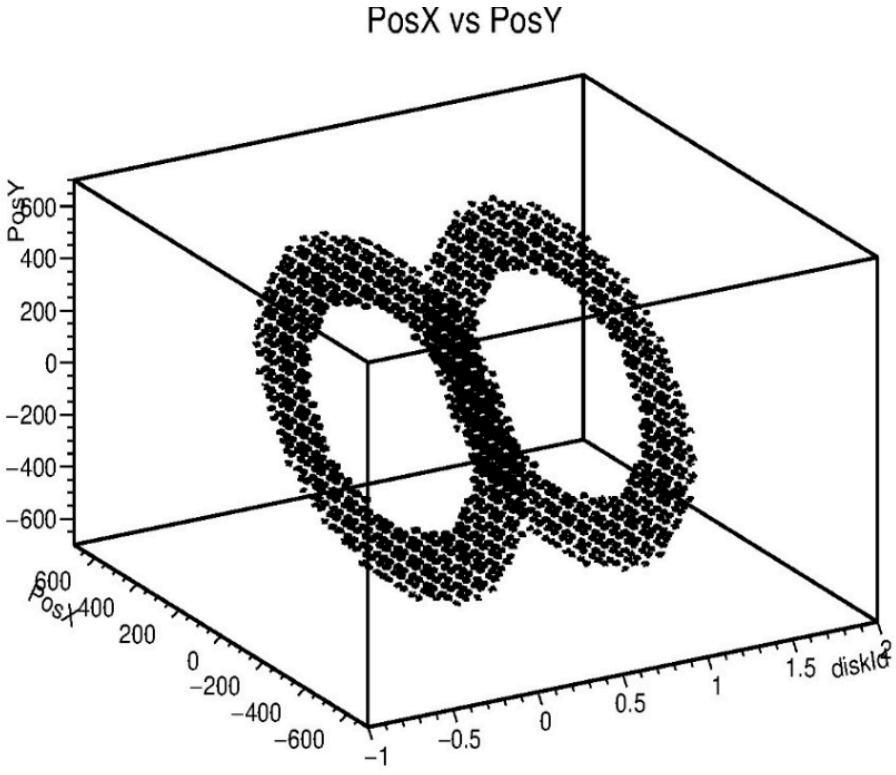
NOT MDC 2018 goals

- Detector design optimization
- Particle trapping, radiation dose and other specialized simulation studies
- SES update
- CRV dead-time or efficiency update
- Momentum calibration strategies
- Calorimeter/energy calibration strategies
- Conditions Database infrastructure development and use
- Channel-level misalignment and calibration
- Collaboration-approved blinding
- Collaboration sanctioned analysis

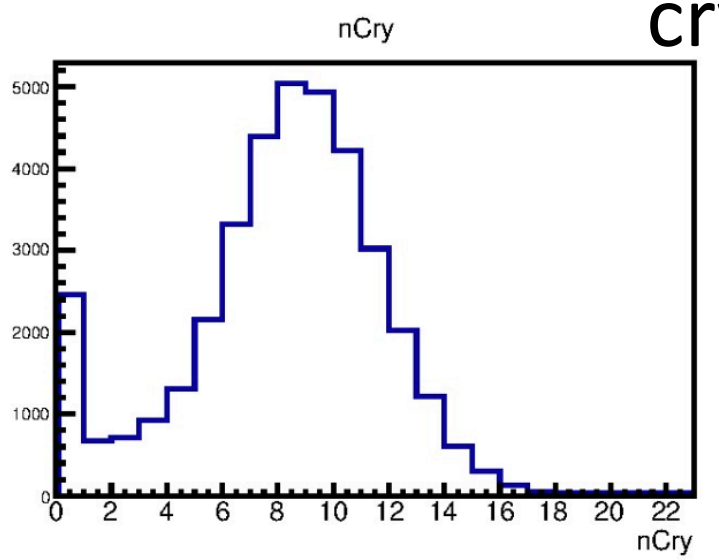
Look at recent produced MDC datasets

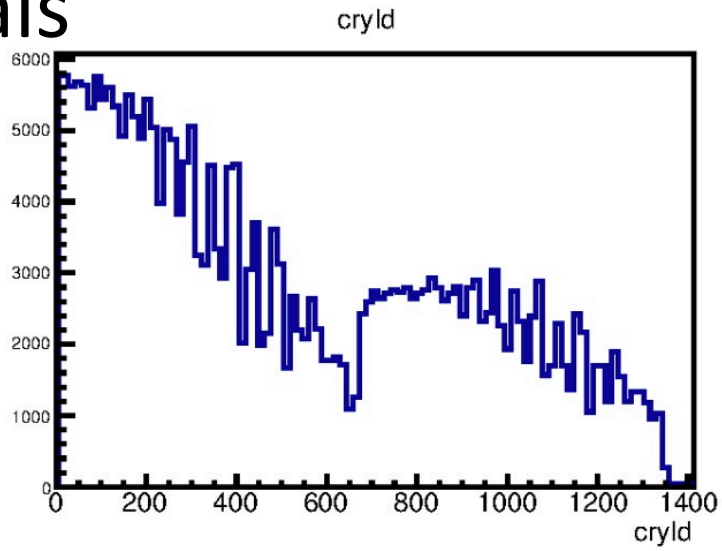
- Detector solenoid files for MDC (CE no mixing): /pnfs/mu2e/scratch/users/brownd/workflow/default/outstage/10252225/00/

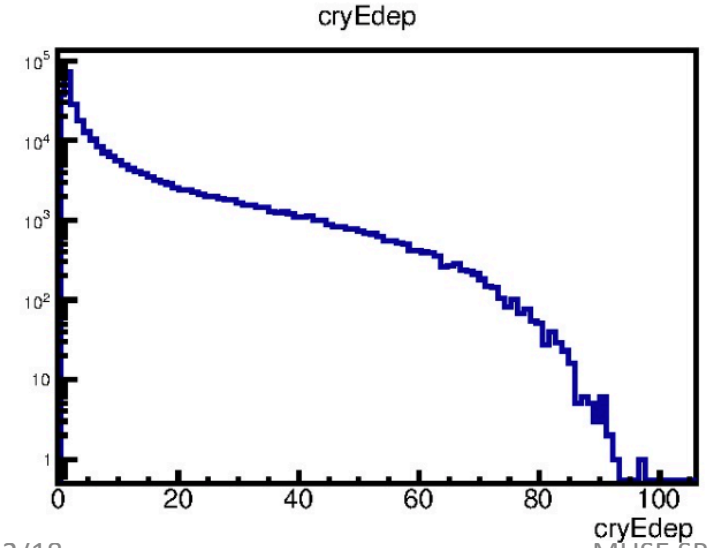


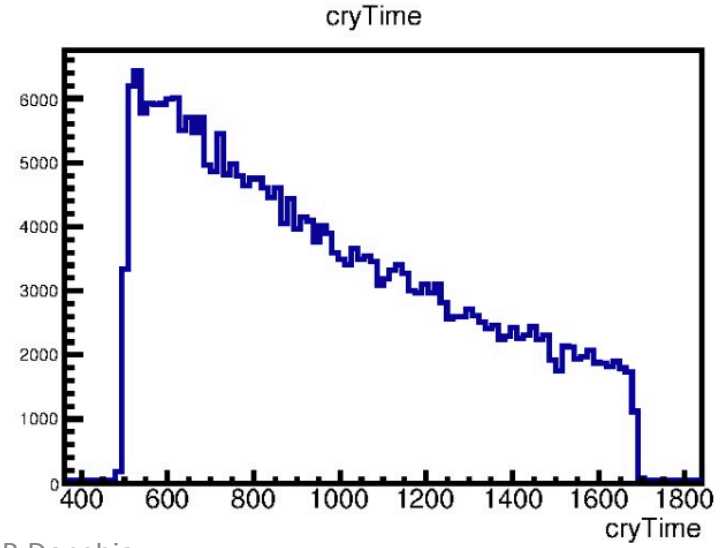


Validation plots crystals

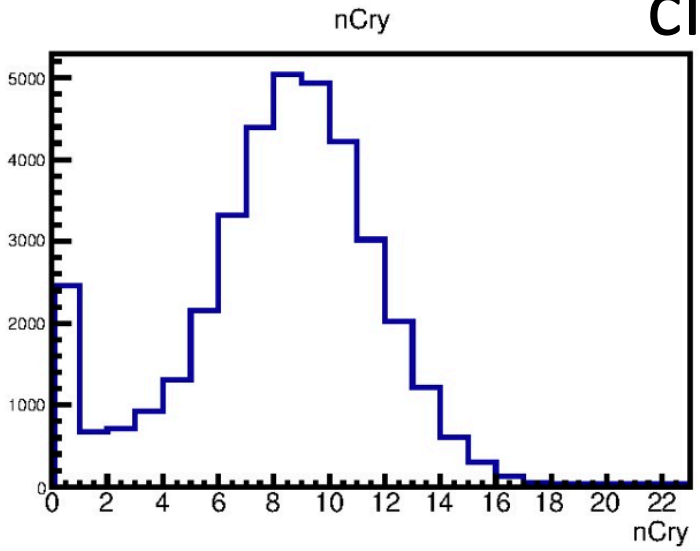


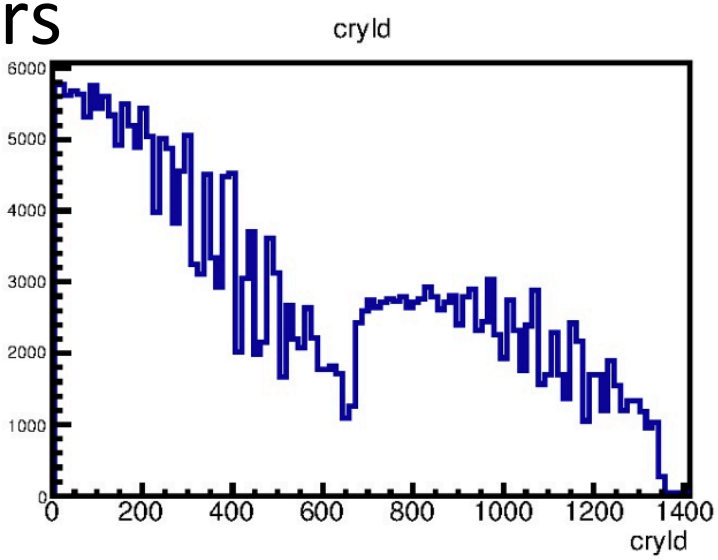


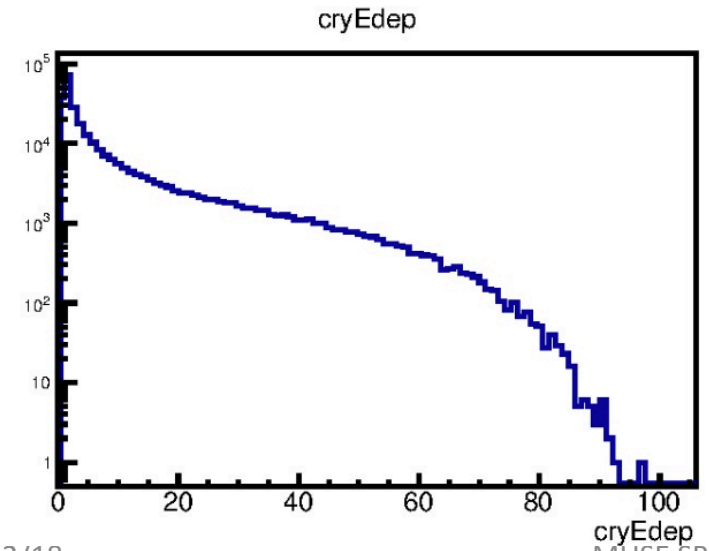


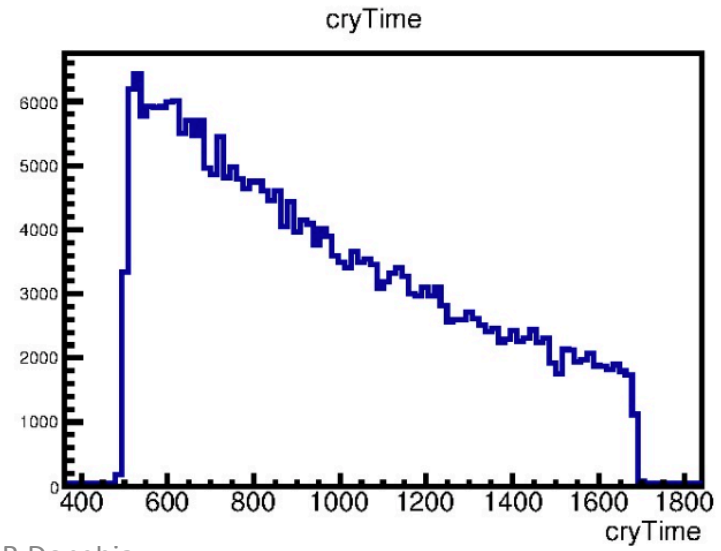


Validation plots clusters









MDC 2018 - Calorimeter

- CaloShowerRO product not properly updated
  - breaking the MC truth matching.
- Running without truth matching, the distributions are fine
  - waiting until the problem is fixed to give the green light

Summary

- Real geometry description achieved
  - Small details (cabling, pipes, steps…) included

- MDC 2018 datasets under study