Work in Progress

[1] https://wiki.bnl.gov/EPIC/index.php?title=TOFPID
[2] https://wiki.bnl.gov/conferences/index.php/ProjectRandDFY23
[3] https://www.overleaf.com/read/vftxyvjtjrvp

eRD112 [2]

- Sensor
  - BNL, HPK/FBK productions
  - Lab/beam test, Irradiation
- Sensor/ASIC integration
  - Interposer
- Mechanical structure
  - Low-density mechanical structure

eRD109 [2]

- ASIC
  - EICROC1, FCFD1, SCIPP
- Frontend electronics
  - Timing chips and streaming readout
  - Barrel/Endcap TOF Hybrids

Simulation [1]

- DD4HEP geometry, digitization, reconstruction
- Spatial resolution requirement
- Timing resolution requirement
- Material budget requirement

Project Engineering and Design (PED) [3]

- Mechanical engineering
  - Barrel TOF
  - Endcap TOF
  - Cooling system
- Electric engineering – postponed/DAQ PED
  - Precision clock distribution (<5 ps)
  - Prototype readout board, cables

Next EPIC Collaboraiton Meeting

From the SC:

The ePIC Collaboration Meeting at JLab (January 9-11, 2023) will consist of plenary sessions only. A large fraction of the time will be dedicated to WGs. Each WG will have a one-h time slot to report (including some discussion time). We ask you to start shaping the time slot dedicated to your WG. We are suggesting a short overview report from the coordinators, and a couple of reports from WG members. This structure could offer active colleagues in the WGs an opportunity to report to the whole Collaboration.

We would like that you start structuring your time slot, also because colleagues coming from far need to start planning their trips already in these weeks.

TOF Simulation and Reconstruction

- Update TOF geometry in DD4HEP
  - Detailed Barrel and simplified Endcap TOFs (8%X_0 Silicon) by Zhenyu (in main)
  - Detailed Forward TOF done by Nicholas (in main)
- Include TOF in tracker assembly in DD4HEP
  - Detailed Barrel and simplified Endcap TOFs by Zhenyu (in main) #154
  - Problem when including the detailed Forward TOF being investigated by Nicholas #191
  - Issue with Forward TOF in tracking #294
- Include TOF hits in EICrecon tracking
  - Done with the help of Dmitry Ramonov (in main) #173
- Create TOF PID reconstruction #201
  - Track projection and TOF plugin template with the help of Dmitry #263
    - Include TOF for TOF hits, path length for projected points on tracking surfaces along track segments
    - Matching between points along track segments and TOF hits #341
- Introduce beam background shall be done consistently for all detectors lead by simulation group
- Introduce charge sharing, and detector noise

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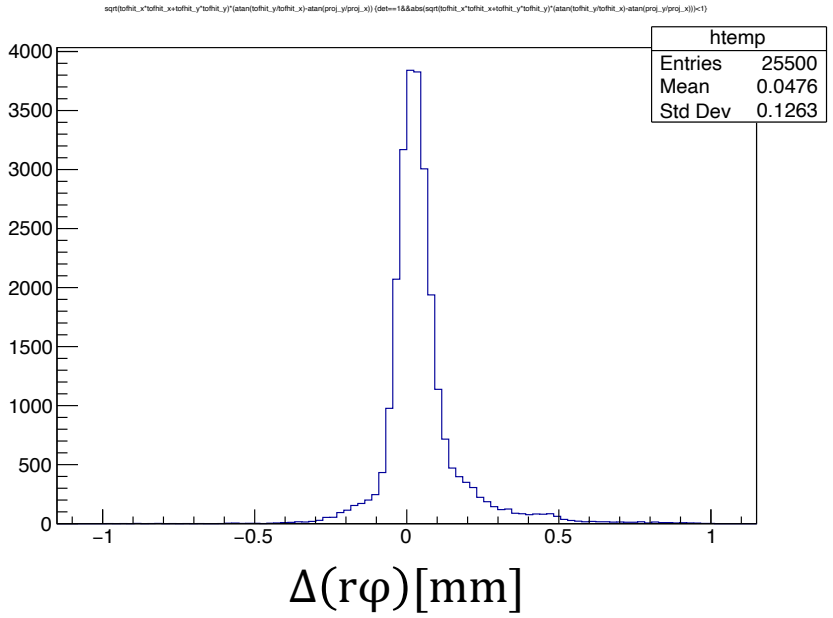
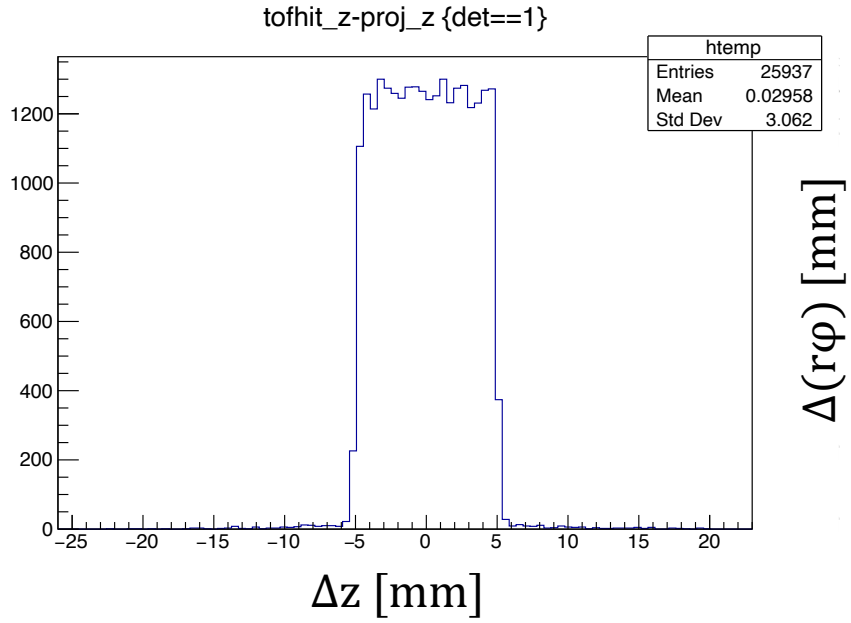
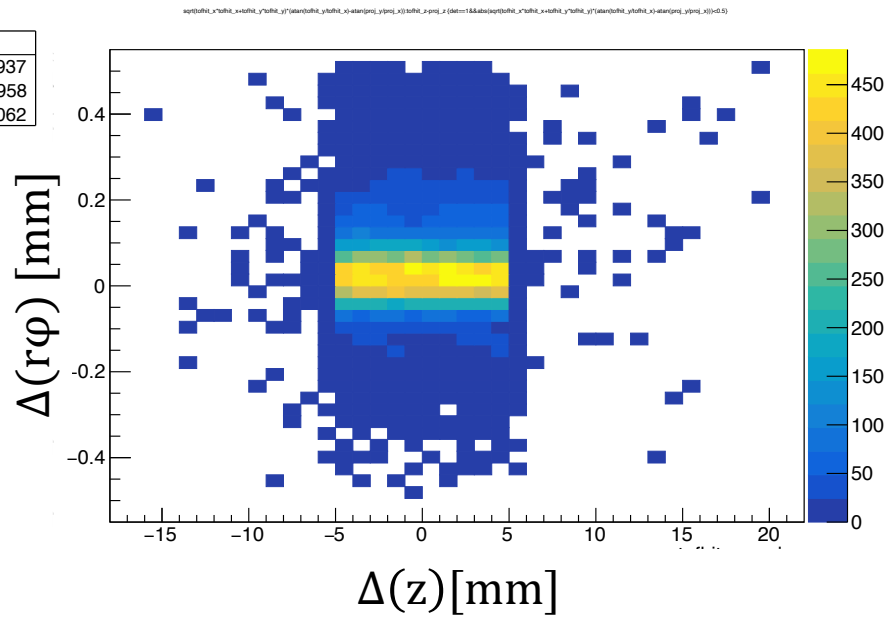
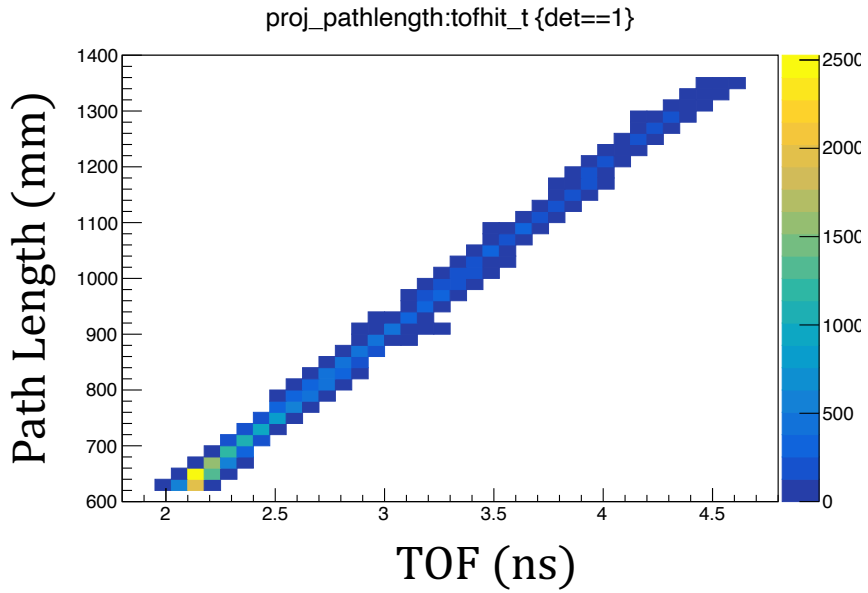
Nicolas:
- TOF endcap surface errors resolved
- Tracks not propagated to endcap despite using hits in track reco
- Resolution and time-of-flight studies were halted to investigate/fix surface and propagation issue

Barrel TOF Matching









Forward TOF Matching