

Work in Progress

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

- [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>

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

TOF Simulation and Reconstruction

- Update TOF geometry in DD4HEP
 - Detailed Barrel and simplified Endcap TOFs (8%X₀ 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](#)
- 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 (in main) [#263](#)
 - Include path length and time of flight for TOF hits on track
 - Add path length and time of flight for TOF hits near track projected position
- Introduce charge sharing, noise, and beam background