

News

- eRD112 FY23 proposal approved for \$250k (see the following pages)
- Reorganization of ePIC (collaboration and) WGs (<https://indico.bnl.gov/event/18449/>)
 - **Evolve DWGs** to a structure more appropriate to the (pre-)TDR/construction phase: **WGs -> Detector Subsystems**
 - Each project corresponds to a subdetector built by a **Detector Subsystem Collaboration** of the groups and institutions contributing to it
 - Each project collaboration will choose its **Detector Subsystem Lead** and **Detector Subsystem Technical Contact** Work in concert with EIC project CAMS
 - The breakdown in projects to be discussed/optimized with the collaboration
 - Collaboration Discussion on Detector Subsystem Collaborations: Friday February 24th, 10:30AM EST
- TOF in tracking
 - Impact of TOF on angular resolution (and calorimeter performance)
 - Issue with forward TOF in tracking
- TOF PID in simulation
 - Reconstruction, validation plots
- TOF digitization:
 - Introduce detector noise: 30 Hz (2-10 Hz from test beam with strip AC-LGAD sensor + GALI-S66+ [link](#))
 - Introduce charge sharing

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>

Simulation [1]

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

Project Engineering and Design (PED) [3]

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

eRD112 [2]

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

eRD109 [2]

- ASIC: EICROC1, FCFD1, SCIPP
- Frontend electronics
 - Low-mass service hybrid

Response from Project Office

- We had a very close look at the eRD112 proposal and request a revision of the funding requests keeping the following in mind:
 - *Reduce the number of produced sensors to the bare minimum
 - *Reconsider the need for 3 different sensor fabrication companies/institutes
 - *Streamline the various tasks and do not spread them too broad among the various institutions. *Try to consolidate FTEs on the level of $< 5\%$

As guideline consider the funding estimated in the R&D plan and your own estimate of the FY23 funding needs in the FY22 proposal: \$250k. Please keep in mind that you received 200k in FY22 that is not spend. Be also prudent in separating R&D and Project Engineering and Design (PED).

FY23 Resource Requests by eRD112

Vendor/ Institute	M&S Item	Cost per Item (k\$)	N. Items	Tot. Cost (k\$)
Sensor Production				175
BNL IO	Sensor fabrication (incl. labor)	50 (10 wafers)	1.5	75 → 75
HPK/FBK	Sensor fabrication	75+3-5/wafer	1	100 → 80
Sensor Characterization				13.7
UIC	M&S for test beam setup	-	-	5 → 5
LANL	M&S for irradiation test	-	-	5
SCIPP	Fermilab 16-channel boards	-	-	3.7
Sensor/ASIC Integration				30
UIC	Interposer fabrication and bump bonding	30	1	30
Mechanical Structure				15
NCKU	Material for light-weight support structure	-	-	10 → 10
Purdue	Material for light-weight support structure	-	-	5 → 5
Travel				21
BNL	Trips to Fermilab testbeam	2	2	4
UIC	Trips to Fermilab testbeam	1	5	5 → 5
ORNL	Trips to Fermilab testbeam	3	2	6
Rice	Trips to Fermilab testbeam	3	2	6
TOT.				254.7 → 180

Table 8: eRD112 resource request for M&S costs in FY23, excluding frontend ASIC and electronics.

FY23 Resource Requests by eRD112

Inst.	Task	Labor Type	FTE (%)	Tot. Cost (k\$)	
Sensor R&D				172.3	
BNL	Sensor+ASIC and test board assembly	El. Tech.	10	20	→ 20
UIC	Sensor+ASIC and test board assembly	El. Tech.	10	15	→ 15
	lab/beam test for sensors and ASICs	Research Sp.	50	45	
LANL	Sensor irradiation test	Scientist	2.5	10	
	Sensor irradiation test	Student	5	5	
Rice	pixel sensor test	Postdoc	40	40	
SCIPP	Oversight and coordination	Project Scientist	5	9	
	TCAD sim. and sensor design	El. Design Specialist	10	16.5	→ 5
	Prototype Assembly	EM Engineer	5	11.8	→ 10
Sensor/ASIC Integration				15	
UIC	interposer design and testing	El. Engineer	10	15	
Mechanical Structure				20	
NCKU	light-weight support structure R&D	Mech. Engineer	10	5	→ 5
Purdue	light-weight support structure R&D	Mech. Engineer	10	15	→ 15
TOT.				207.3	→ 70

Table 9: eRD112 budget request for labor costs in FY23, excluding frontend ASIC and electronics.