



News and Organization

Wei Li (Rice University)

**ePIC TOF WP2 working meeting
April 19, 2024**

Electron-Ion Collider

New TOF DSC ORG

- Leadership Structure
- Work packages combining BTOF and FTOF

1. Sensors (2 coordinators)

Simone Mazza, Japanese colleague

2. Frontend Electronics (all electronics that are on the detector) (2 coordinators)

Wei Li, TBD

3. Module local integration and assembly (2 coordinators)

Mathieu/Matthew, Asian colleague

4. System tests and validation (2 coordinators)

Prithwish Tribedy (FF Liaison)+Takashi Hachiya

5. Mechanical structure, cooling and global integration (2 coordinator)

Andy Jung, Yi Yang

6. DAQ & Clock distribution (1 coordinator)

Tonko Ljubacic

7. Power system, Detector slow control, monitor and safety system (1 coordinator)

Frank Geurts

8. Simulations, software & calibration, Database(1 coordinator)

TBC?

Position	Candidate(s)
1 Detector Subsystem Leader	Zhangbu Xu
1 Deputy DSL	Satoshi Yano
2 Detector Subsystem Tech. Coordinators	Mathieu Benoit, Matthew Gignac

Welcome to WP2!

BTOF

Preliminary schedule

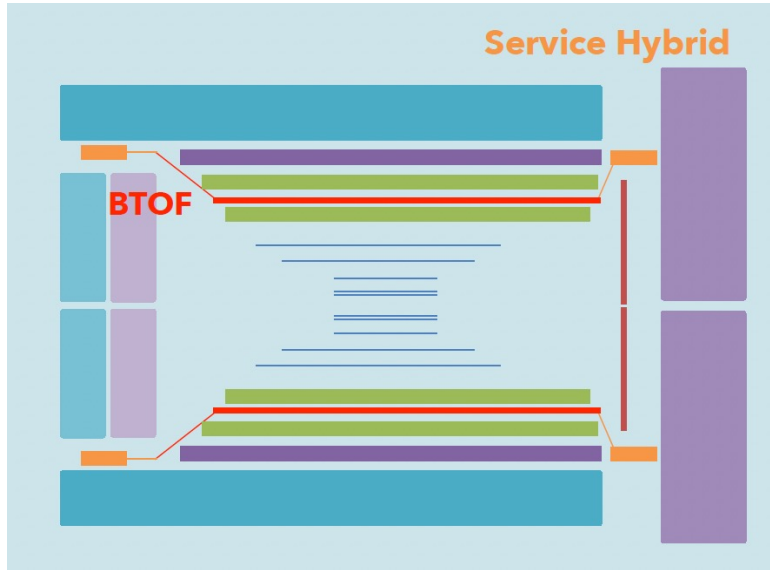
FTOF

EEW.10.04.04.01.02	BTOF Frontend Electronics	1-Oct-23	31-Dec-28
EEW.10.04.04.01.02.01	BTOF ASIC	1-Oct-23	31-Dec-28
	BTOF ASIC Preliminary Design (FCFDv2)	1-Jan-24	31-Aug-24
	BTOF ASIC Preliminary Design Fabrication	1-Sep-24	31-Dec-24
	BTOF ASIC Preliminary Design Validation	1-Jan-25	30-Sep-25
	BTOF ASIC Final Design (FCFDv3)	1-Apr-25	31-Dec-25
	BTOF ASIC Final Design Fabrication	1-Jan-26	30-Apr-26
	BTOF ASIC Final Design Validation	1-May-26	31-Dec-26
	BTOF ASIC Preproduction Fabrication	1-Jan-27	30-Apr-27
	BTOF ASIC Preproduction Validation	1-May-27	31-Jul-27
	BTOF ASIC Production Fabrication	1-Aug-27	31-Jul-28
	BTOF ASIC Production QA&QC	1-Sep-27	31-Dec-28
EEW.10.04.04.01.02.02	BTOF Flex Module PCB	1-Oct-23	31-Dec-28
	BTOF Flex Module PCB Preliminary Design	1-Jan-24	31-Aug-24
	BTOF Flex Module PCB Preliminary Design Fabrication	1-Sep-24	31-Dec-24
	BTOF Flex Module PCB Preliminary Design Validation	1-Jan-25	30-Sep-25
	BTOF Flex Module PCB Final Design	1-Apr-25	31-Dec-25
	BTOF Flex Module PCB Final Design Fabrication	1-Jan-26	30-Apr-26
	BTOF Flex Module PCB Final Design Validation	1-May-26	31-Dec-26
	BTOF Flex Module PCB Preproduction Fabrication	1-Jan-27	30-Apr-27
	BTOF Flex Module PCB Preproduction Validation	1-May-27	31-Jul-27
	BTOF Flex Module PCB Production Fabrication	1-Aug-27	31-Jul-28
	BTOF Flex Module PCB Production QA&QC	1-Sep-27	31-Dec-28
EEW.10.04.04.01.02.03	BTOF Service Hybrid	1-Oct-23	31-Dec-28
	BTOF Service Hybrid Design	1-Oct-23	30-Sep-24
	Readout Board Initial Design	1-Oct-23	30-Sep-24
	Power Board Initial Design	1-Oct-23	30-Sep-24
	BTOF Service Hybrid Initial Design	1-Oct-24	31-Mar-25
	Readout Board Initial-Design	1-Oct-24	31-Oct-24
	Power Board Initial Design	1-Oct-24	31-Oct-24
	Readout Board Initial Fabrication	1-Nov-24	28-Feb-25
	Power Board Initial Fabrication	1-Nov-24	28-Feb-25
	Readout Board Initial Validation	1-Mar-25	31-Mar-25
	Power Board Initial Validation	1-Mar-25	31-Mar-25
	BTOF Service Hybrid Final Design	1-Apr-25	31-Mar-26
	Readout Board Final Design	1-Apr-25	30-Apr-25
	Power Board Final Design	1-Apr-25	30-Apr-25
	Readout Board Final Fabrication	1-May-25	31-Aug-25
	Power Board Final Fabrication	1-May-25	31-Aug-25
	Readout Board Final Validation	1-Sep-25	31-Mar-26
	Power Board Final Validation	1-Sep-25	31-Mar-26
	BTOF Service Hybrid Preproduction	1-Apr-26	31-Mar-27
	Preproduction Fabrication and Assembly	1-Apr-26	28-Feb-27
	QA/QC Development, Testing and Optimization	1-May-26	31-Mar-27
	BTOF Service Hybrid Production	1-Apr-27	31-Dec-28
	Production Fabrication and Assembly	1-Apr-27	30-Nov-28
	Production QA/QC	1-May-27	31-Dec-28

1.1	FTOF Frontend Electronics	04-Nov-2024	01-Sep-2028
1.1.1	FTOF ASIC	04-Nov-2024	04-Feb-2028
1.1.1.1	FTOF ASIC Final Design and Demonstrator	04-Nov-2024	02-Oct-2026
1.1.1.1.1	EICROC1 Design and submission	04-Nov-2024	21-Mar-2025
1.1.1.1.2	EICROC1 production	24-Mar-2025	11-Jul-2025
1.1.1.1.3	EICROC1 Testing	14-Jul-2025	31-Oct-2025
1.1.1.1.4	EICROC2 Final Design	03-Nov-2025	20-Feb-2026
1.1.1.1.5	EICROC2 production	23-Feb-2026	12-Jun-2026
1.1.1.1.6	EICROC2 Full Testing	15-Jun-2026	02-Oct-2026
1.1.1.1.7	Wafer Probe Development and Procurement	23-Feb-2026	10-Jul-2026
1.1.1.2	FTOF ASIC Preproduction	05-Oct-2026	09-Jul-2027
1.1.1.2.1	EICROC3 Preproduction Procurement and Fabrication	05-Oct-2026	19-Feb-2027
1.1.1.2.2	EICROC3 Full Testing	22-Feb-2027	09-Jul-2027
1.1.1.2.3	EICROC3 Wafer Probe Testing	22-Feb-2027	14-May-2027
1.1.1.2.4	EICROC3 packaging and shipping for bump-bonding	17-May-2027	28-May-2027
1.1.1.3	FTOF ASIC Production	12-Jul-2027	04-Feb-2028
1.1.1.3.1	EICROC3 Production Procurement and Fabrication	12-Jul-2027	26-Nov-2027
1.1.1.3.2	EICROC3 Production QA/QC (wafer probing)	29-Nov-2027	21-Jan-2028
1.1.1.3.3	EICROC3 Packaging and Shipping for Bump-Bonding	24-Jan-2028	04-Feb-2028
1.1.2	FTOF Service Hybrid and Module PCB	04-Nov-2024	13-Dec-2027
1.1.2.1	FTOF Service Hybrid and Module PCB Design	04-Nov-2024	21-Apr-2025
1.1.2.1.1	Readout Board Design	04-Nov-2024	21-Apr-2025
1.1.2.1.2	Module PCB Design	04-Nov-2024	24-Feb-2025
1.1.2.1.3	Power Board Design	04-Nov-2024	21-Apr-2025
1.1.2.2	FTOF Service Hybrid and Module PCB Design	24-Feb-2025	15-Jun-2026
1.1.2.2.1	Readout Board Initial Prototyping	21-Apr-2025	06-Oct-2025
1.1.2.2.2	Module PCB Initial Prototyping	24-Feb-2025	11-Aug-2025
1.1.2.2.3	Power Board Initial Prototyping	21-Apr-2025	06-Oct-2025
1.1.2.2.4	Initial system tests	06-Oct-2025	29-Dec-2025
1.1.2.2.5	Readout Board Final Prototyping	06-Oct-2025	23-Mar-2026
1.1.2.2.6	Module PCB Final Prototyping	11-Aug-2025	26-Jan-2026
1.1.2.2.7	Power Board Final Prototyping	06-Oct-2025	23-Mar-2026
1.1.2.2.8	Final system tests	23-Mar-2026	15-Jun-2026
1.1.2.3	FTOF Service Hybrid and Module PCB Preproduction	23-Mar-2026	02-Nov-2026
1.1.2.3.1	Common Electronic Components Procurement	23-Mar-2026	07-Sep-2026
1.1.2.3.2	Preproduction Fabrication and Assembly	23-Mar-2026	13-Jul-2026
1.1.2.3.3	QA/QC Development, Testing and Optimization	13-Jul-2026	02-Nov-2026
1.1.2.4	FTOF Service Hybrid and Module PCB Production	02-Nov-2026	13-Dec-2027
1.1.2.4.1	Vender Fabrication and Assembly	02-Nov-2026	19-Apr-2027
1.1.2.4.2	Production QA/QC	19-Apr-2027	29-Nov-2027
1.1.2.4.3	Packaging and Shipping for Module Assembly	29-Nov-2027	13-Dec-2027

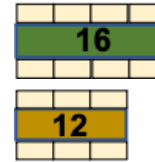
Detector layouts

BTOF

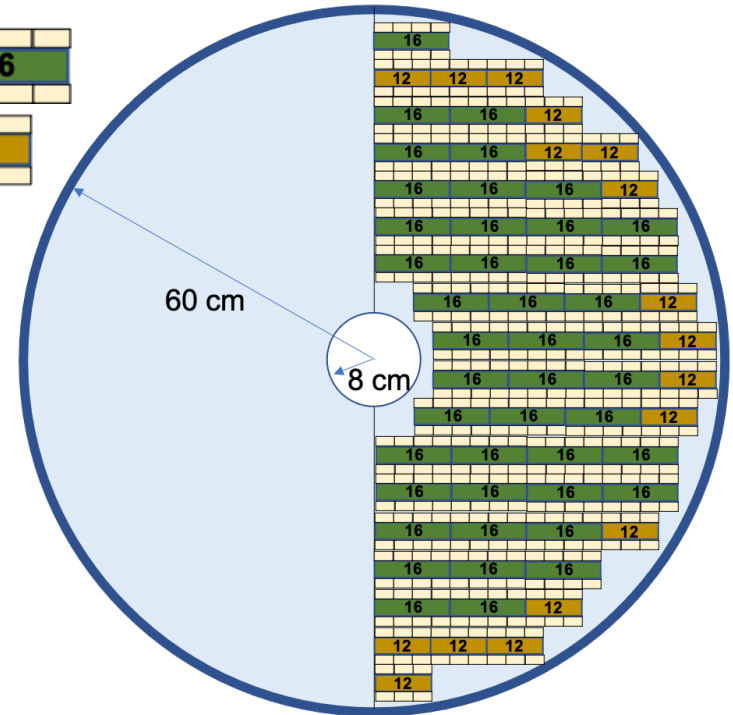


64 ASICs per SH

FTOF



x-y view:



Need to advance details of the layout design (modules, service hybrids)

Deliverables

ASICs:

- EICROC (FTOF): Omega, BNL, ORNL
- FCFD (BTOF): FNAL, LBNL, ORNL

Service Hybrids: BNL, Rice, LBNL, ...

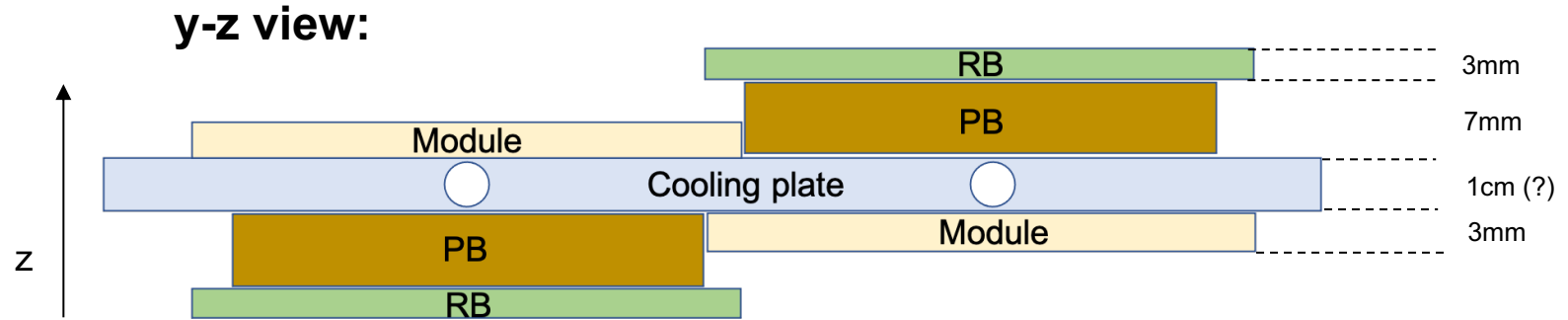
- Readout Boards
- Power Boards
- Module Boards
- Flex PCB

We need to start documenting requirements and designs on twiki, google docs.

- Readout Board design: <https://twiki.cern.ch/twiki/bin/view/Main/EpicSH>
- Power Board design: <https://twiki.cern.ch/twiki/bin/view/Main/EpicPB>
- EICROC interface requirements: [link](#)
- Layout design document: coming

Backups

FTOF detector layout (v1)



(illustration only, thickness not exactly to scale)

Material composition:

- RB: 1-2 mm Kapton + FPGAs
- PB: 1-2 mm Kapton + coils + bPol12
- Cooling: a few mm to 1cm? (Andy/Yi)
- Module: 1mm Si + 1mm AlN