

## **P2 Saclay/Mainz collaboration meeting**

M. GAILLIARD

P2 BASKET, IRFU, CEA Saclay

April 8, 2026

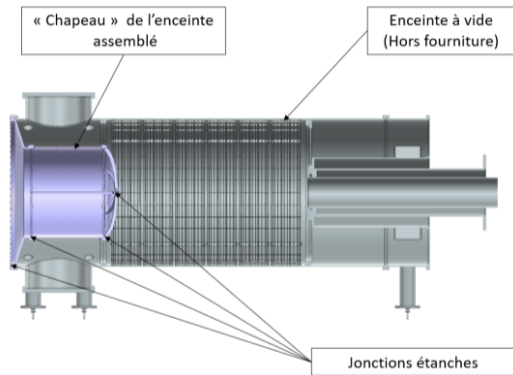


# Mechanics

# Mechanics - Chapeau

## New Chapeau design

- Specifications finalized
  - Shorter cylinder
  - Carbon membrane
  - Conical end-flange (easier to construct)
- **Now** : Call for tender (until end of May)
- Contract planned in September
- **Delivery T1-T2 2027**

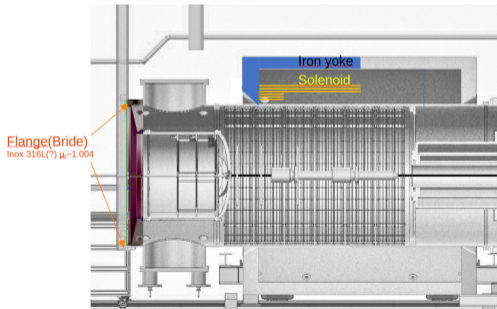


*Patrice, Sandrine*

# Mechanics - B field

## Magnetic field distortion

- due to end-flange (Stainless steel)
- Computation of field distortion ongoing (Laurent)



Magnetic Field Parameters for 2D Calculation  
Not to scale!!!

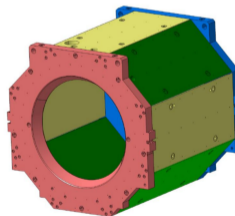
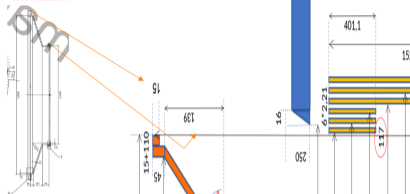


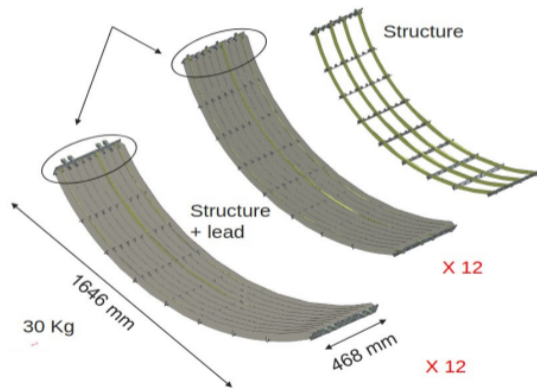
Figure I-3: Yoke 3D model (Courtesy of Mainz University)

# Mechanics - Update

## X-ray Vacuum shielding (90% decrease photon rate)

- 24 aluminum frames; 10 lead sheets/frame
- ordered, delivery expected in **April 2026!**

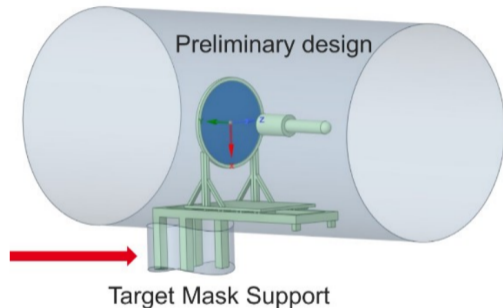
Assembly on site!



# Mechanics - Target Mask

## Target Mask & Support

- First ideas / drawings
- Any info on support, etc ?
- Dedicated discussion would be helpful

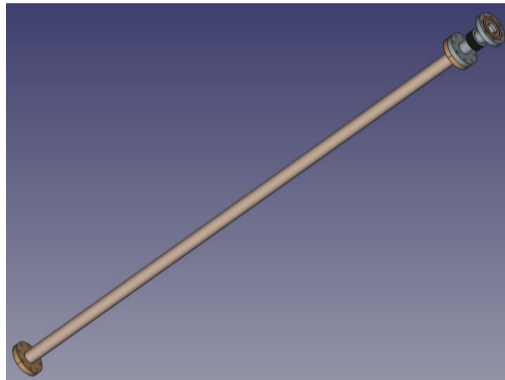


*Sandrine*

# Mechanics - Update

## Beam tube extension

- Idea to coordinate with MESA for this piece
- Step files sent!
- Dedicated discussion would also be helpful



*Sandrine*

# Mechanics - Planning 2026



- **Chapeau: T4 2026 - T2 2027**
  - Call for tender **end March** → contract **early summer 2026** → construction **few months (TBC)**
- **Membrane : T3 2026**
  - Design finalized, company identified, quote available
  - T1-T2 : mechanical and vacuum tests with probes; T3 : construction
- **Vacuum chamber shielding : T3 2026** (installed first)
  - Design finalized, contacts established, quote available
- **Target mask : T4 2026** (installed second)
  - interface with target support to be defined (dedicated meeting needed)
- **Beam tube extension : T4 2026**



# Detectors

# Detectors

## Construction

- R&D phase to solve issues with (small) 10x10 detector
- about to receive new PCB for bulking of full scale prototypes

## New beam test planned

- July 2026, at CERN (SPS)
- with 3-4 full scale prototypes
- close-to-final readout, including back-end processing and algorithmics

# Detectors - Planning 2026 – unchanged

## ■ Simulations

- Finalize studies of x-ray interaction in MM (SOLEIL)

## ■ New Chapeau geometries with vacuum volume in GEANT4

- Physics Fit of  $A^{PV}$  for backward measurement with pseudo-data
- Pattern recognition and Lookup Table (3 channels → truth values) in FPGA

## ■ Detector Performances

- Prioritize the detector development process
- Set the plan for detector integration/validation/commissioning
- Detector testing in Magnetic field
- Finalize analysis of test beam data (SPS)



# Electronics

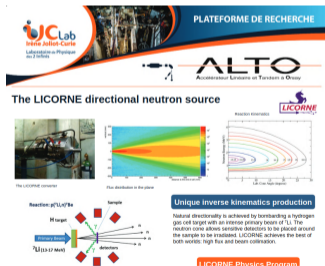
# Electronics - Irradiation tests

## X-ray

- TID with X-rays, week of **April 21st**
- With high intensity Cobalt source @ Saclay

## Neutron

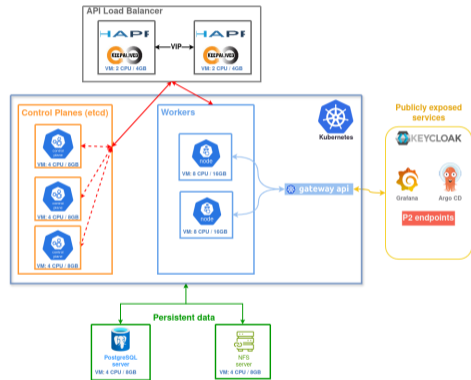
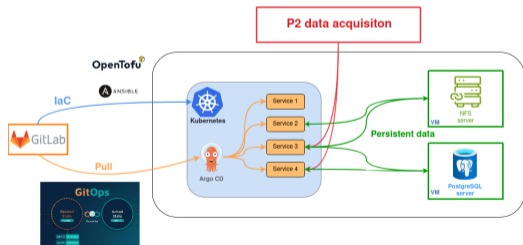
- learning from previous irradiation run @ A1
- New: **September** in Orsay (TANDEM accelerator, 0.5 - 4 MeV)



# Electronics - Update

## database infrastructure in place

- For hardware inventory, configuration, calibration, run conditions
- Can be shared if desired

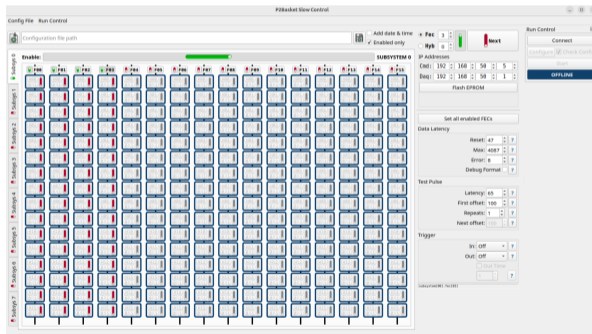


*D. Corre, A. Fornica, P.F Giraud*

# Electronics - Update

## GUI for slow control

- to configure all the 12 back-end boards (15 hybrids per board)
- Can be calibrated programmatically



Shebli

# Electronics - Planning 2026 – unchanged

## ■ Validate system readout on 1/6 of the tracker

- 2026 : production, construction, validation, commissioning

## ■ Frontend

- Develop, validate and produce 50 detector interface boards with protection circuits

## ■ Supervisor

- Make supervisor board choice
- Develop supervisor-machine interface board
- Develop run-control part of the supervisor software

# Electronics - Planning 2026 – unchanged



## ■ System

- Understand radiation and magnetic field related issues
  - May have important consequences for backend electronics positions
- Finalize LV distribution system
- Devise and validate frontend cooling
- Develop software and firmware versions of on-line track-finding algorithms

## ■ Software

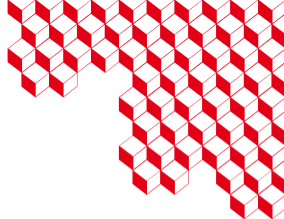
- Pursue run-control framework development
- Simplified GUI for operating the system
- Monitoring visualizations
- Run management including run conditions

# Conclusions

- Progress **in accordance** with planning so far!
- Topical meetings:
  - **Target support** (needed)
  - **beam tube extension** (needed)
  - database infrastructure (if desired)



irfu



**Thank you !**

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