Status of the new project Radioactive Ion Facility at IFIN-HH (acronym: RIF@IFIN)

Florin Negoiță
ELI-NP and DFN/IFIN-HH

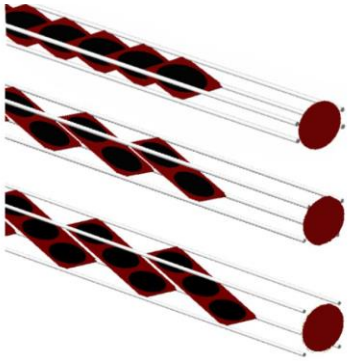
Outline

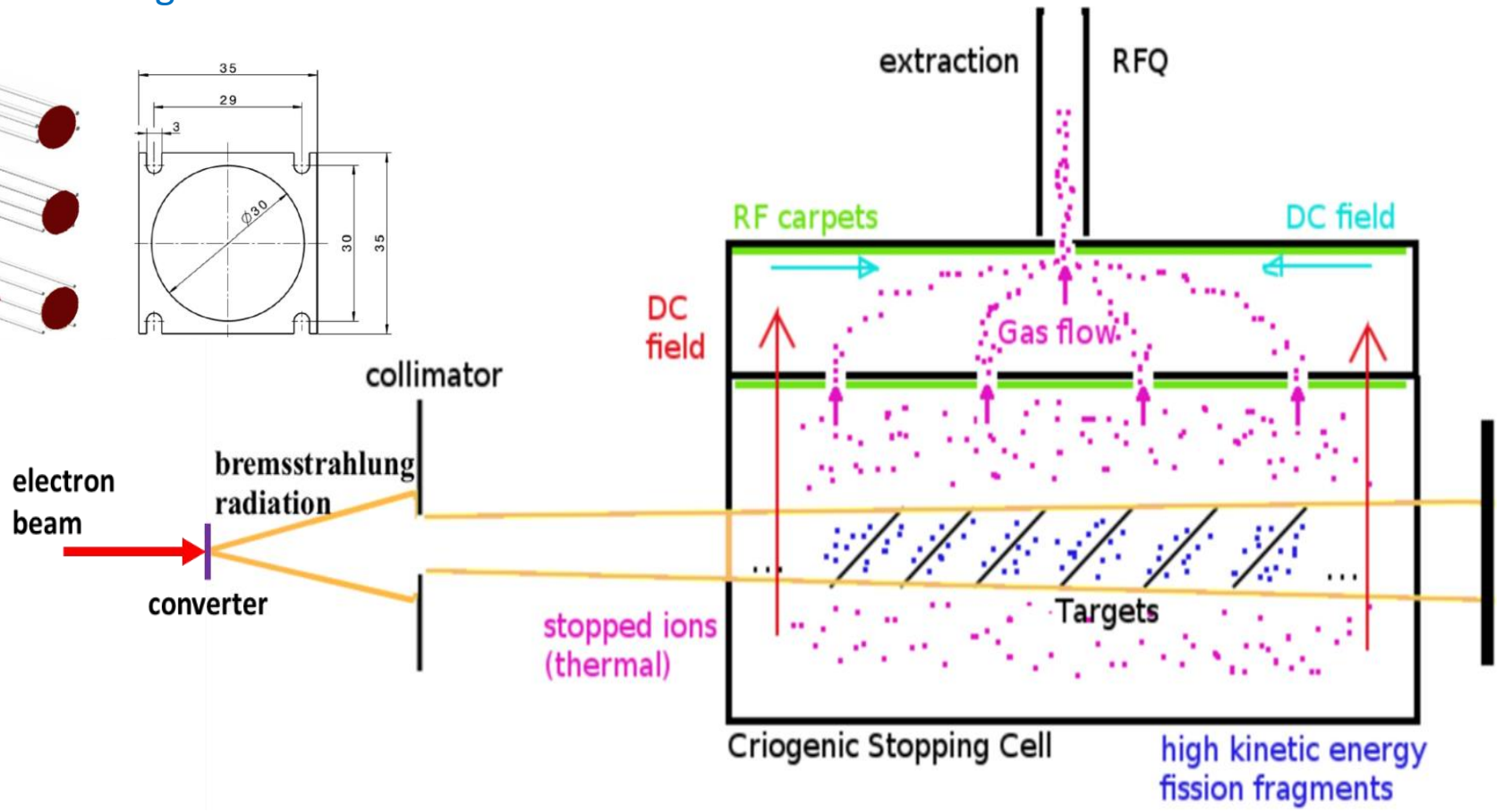
- Status of RIF@IFIN project in old cyclotron building
- New implementation constraints
- Updated timeline and next steps

Photofission in cryogenic gas cell

- Photofission in 50 x 3 μm U targets
- Total length of the gas cell: ~2 m

fast ($\sigma \approx 10$ ms), efficient ($\varepsilon > 60\%$)
same for all elements





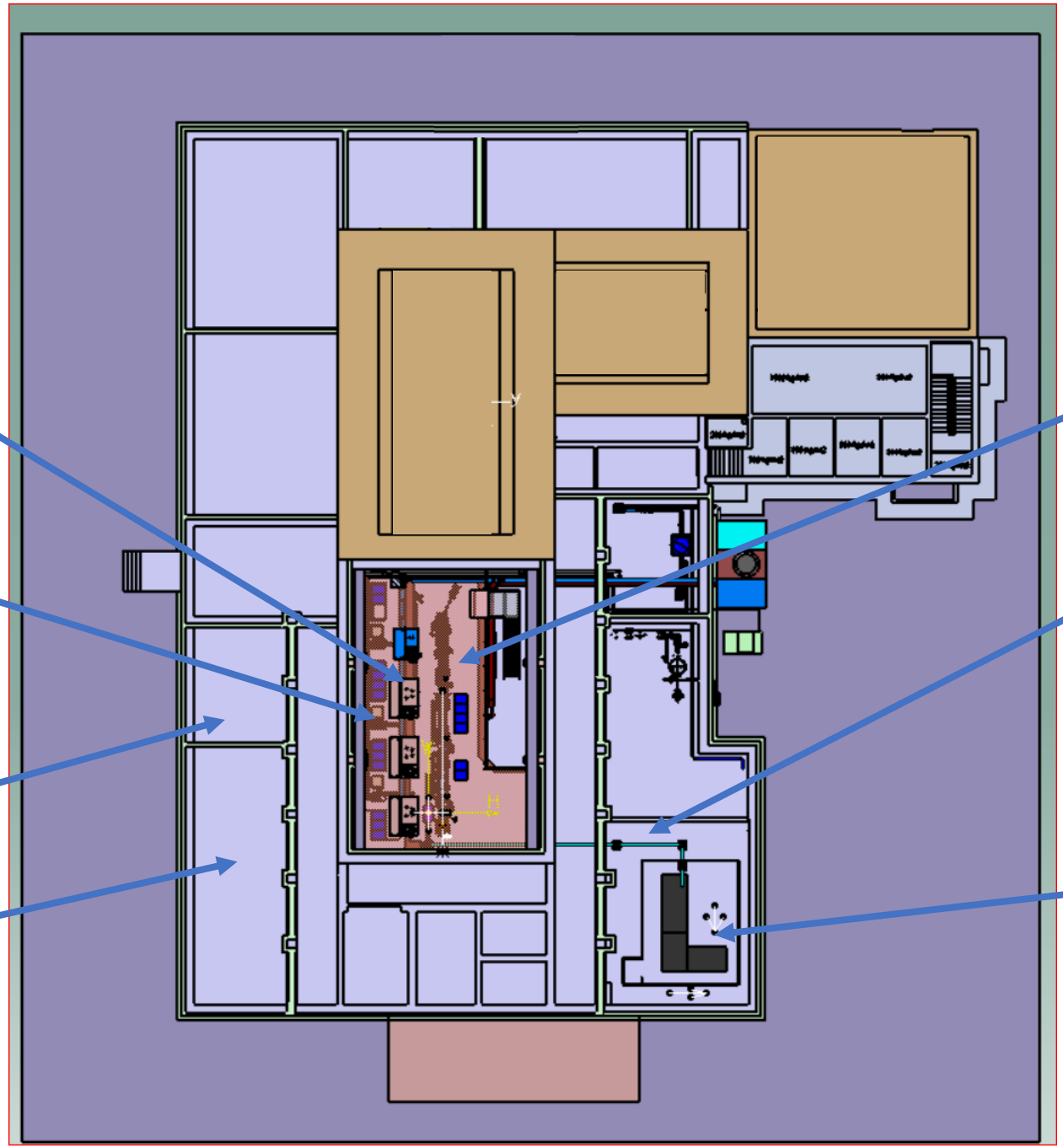
HADO-CSC = High Areal Density with Orthogonal extraction Cryogenic Stopping Cell

- Planed within ELI-NP project to be built in collaboration with Univ. Giessen (Germany)
  [see D. Balabanski et al., Rom.Rep.Phys 68 (2016) S621 and P. Constantin et al., NIMB 397 (2017)1]

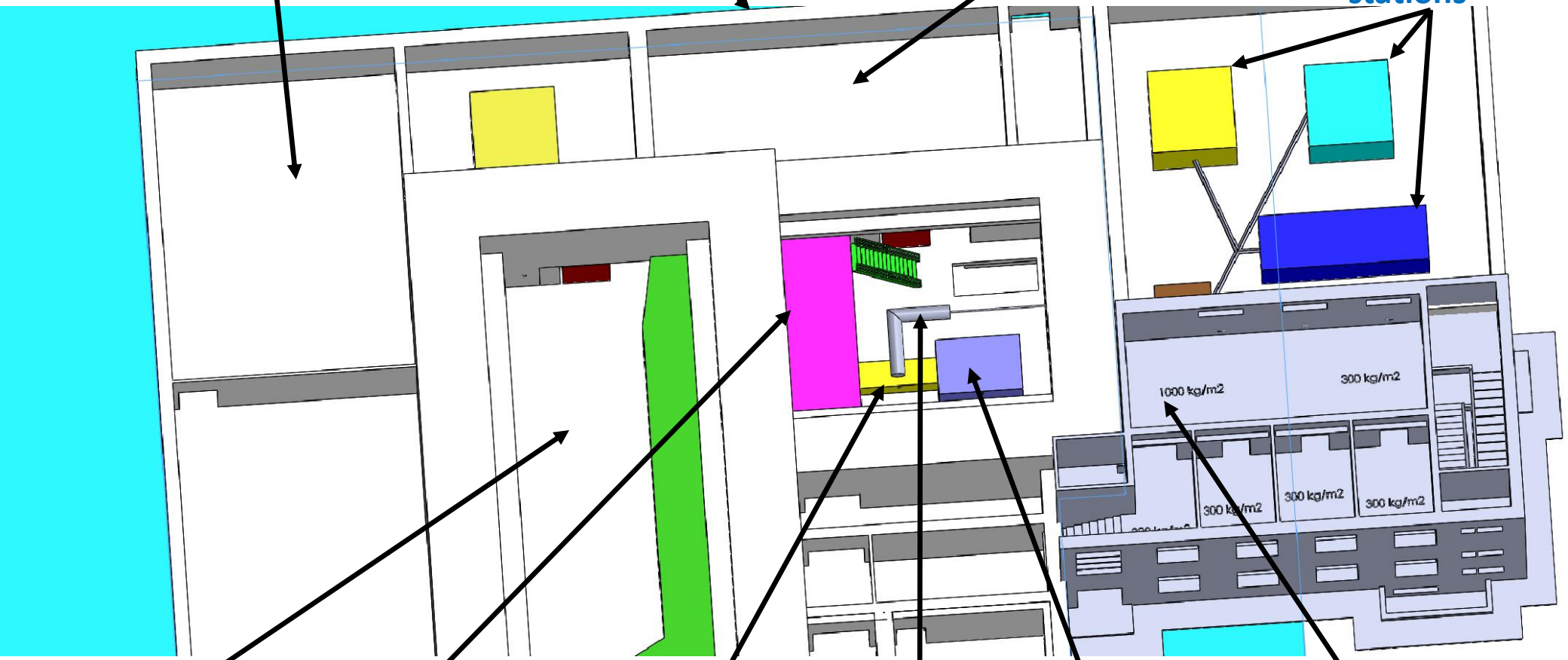
Location of Cyclotron Building

The cyclotron building (from ~1956)

Extension (from ~70s)


Modulators and Klystrons on the tunnel roof
Row of rack and chillers on ground floor
Power Supply Room
Linac Control Room
LINAC
Laser beam at ground level with removable segment in Phase I.
Laser clean room

3D model for Target Area and experimental Area



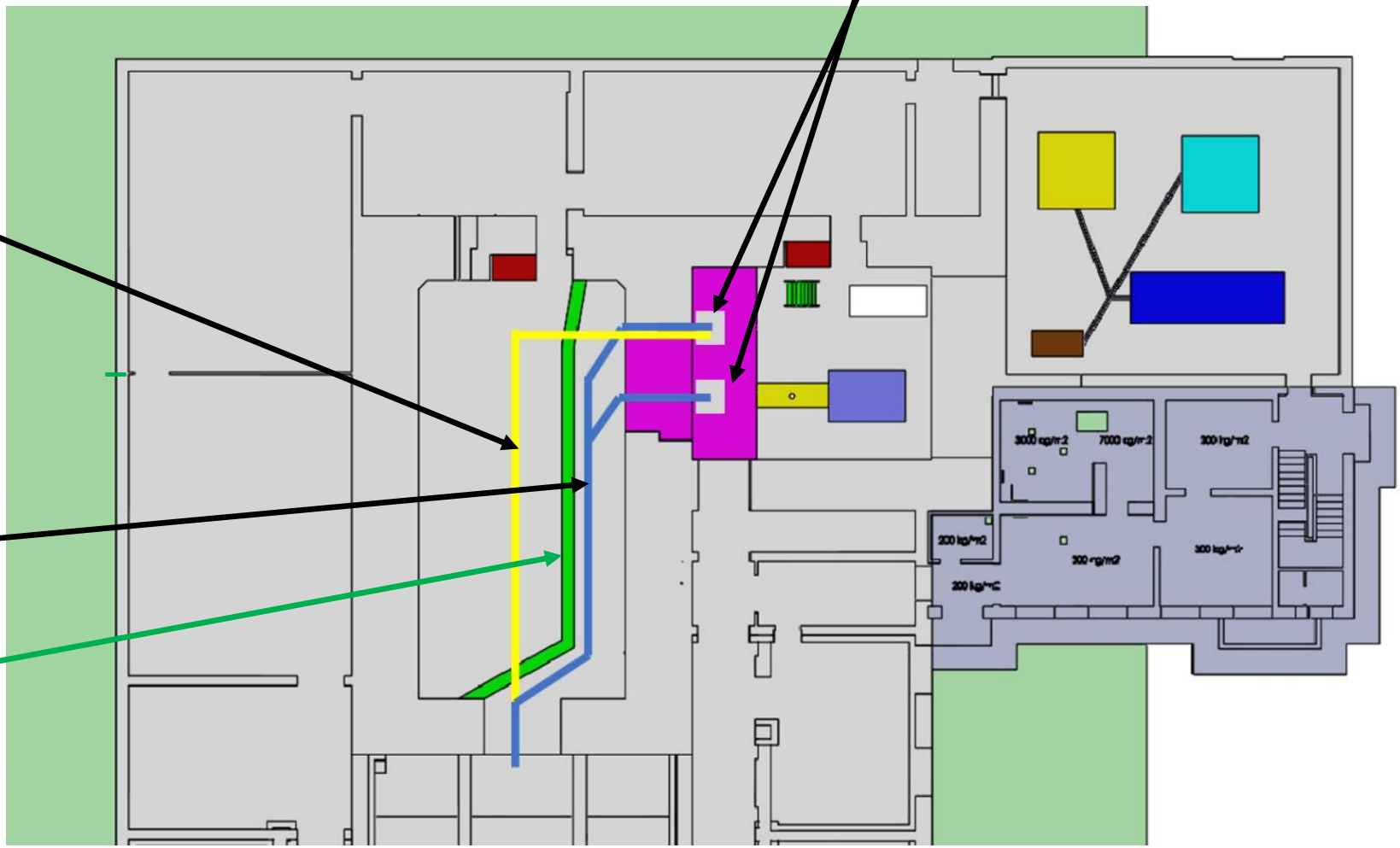
Electron beamlines

Two heavy shielded target-converter irradiation station

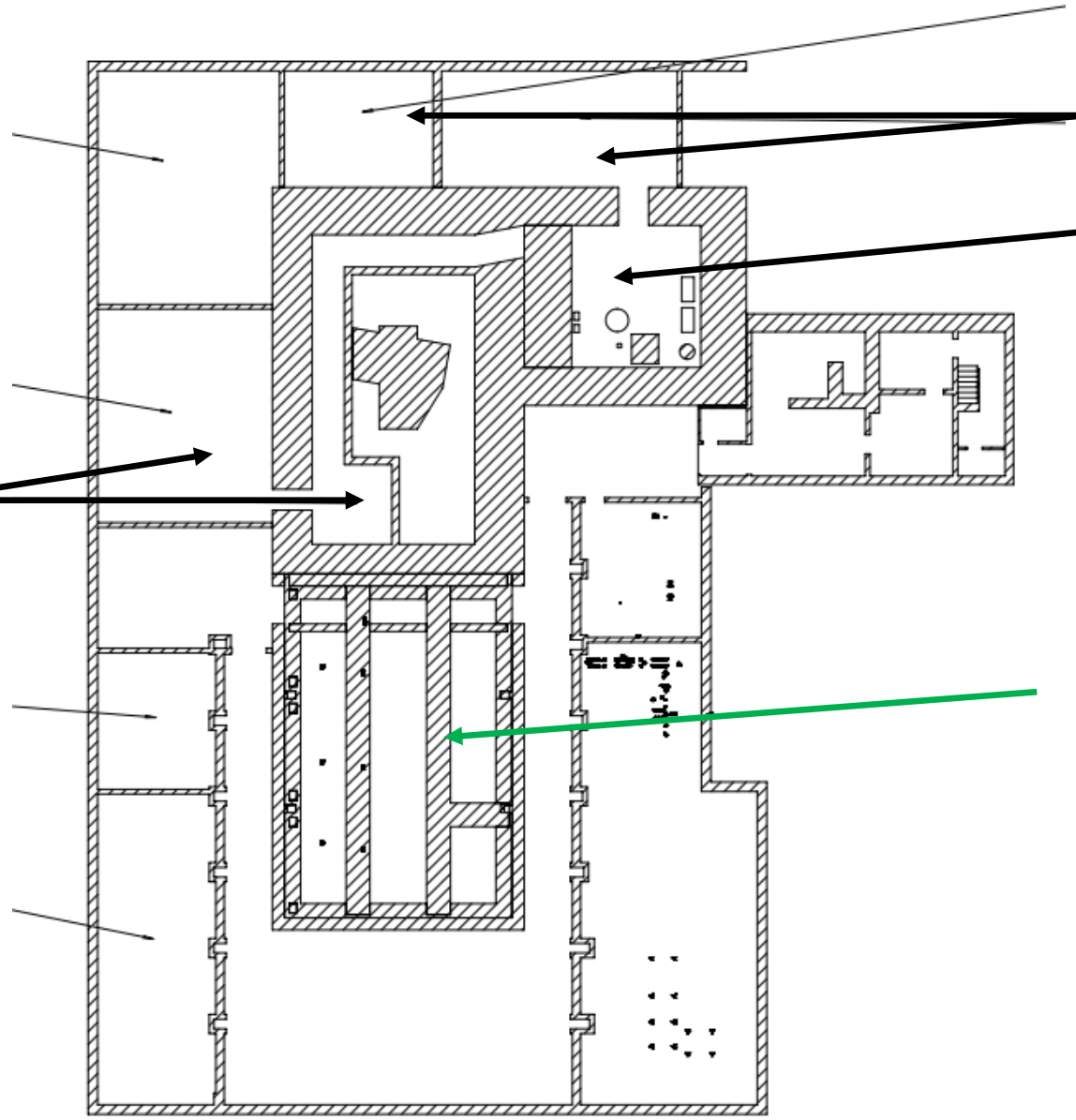
High current commissioning beamline (at h=1.5 m)

Beamlines at h=1 m

Tunnel extension



Basement of experimental area



New implementation constraints

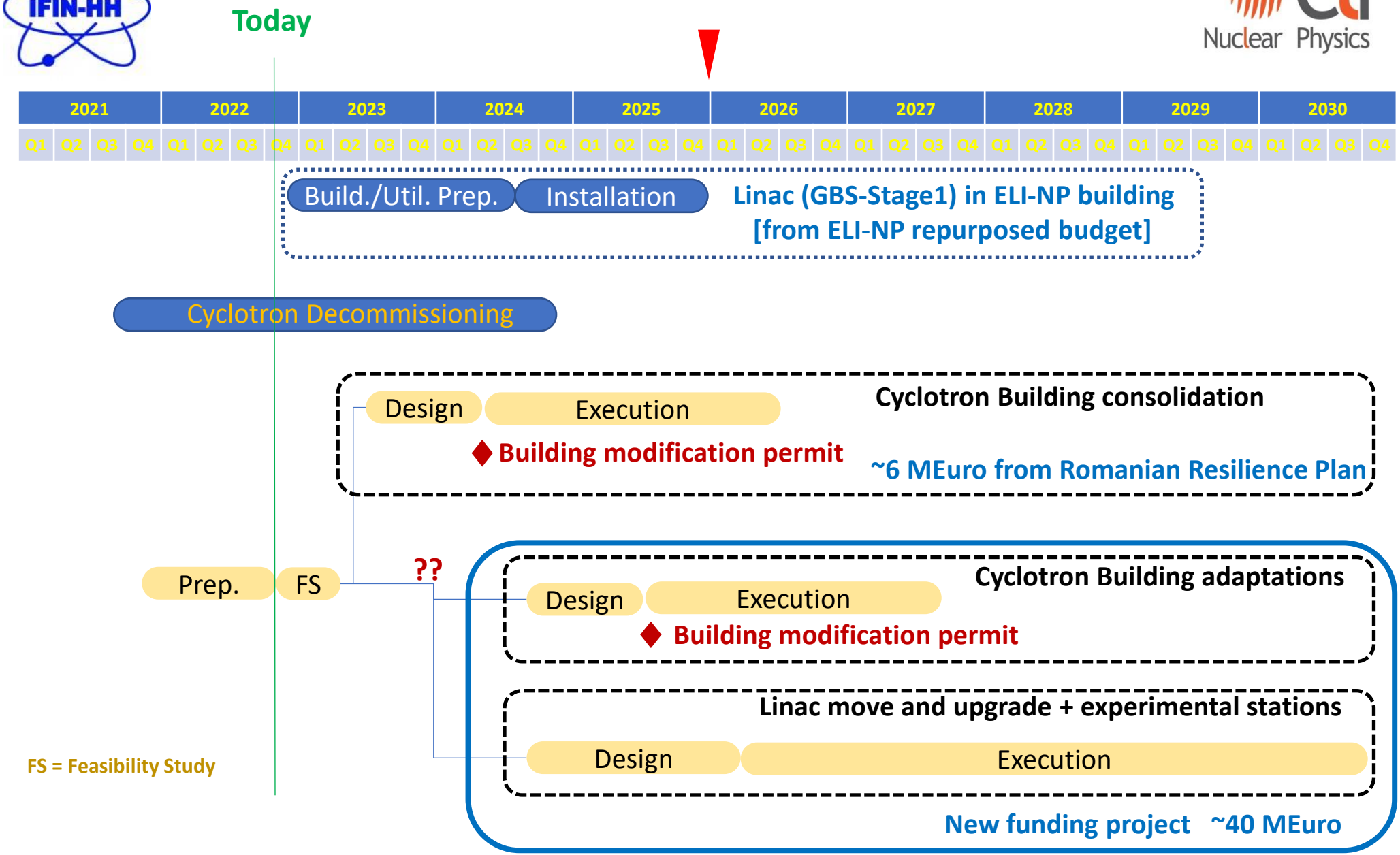
- EU funding for ELI-NP project ends in Dec. 2023
  => IFIN-HH have to become again owner of GBS Stage 1 equipment

- Commissioning (put in operation/use) by Dec. 2025
  => Phase 1 of RIF @ IFIN project means:
    - installation and commissioning of GBS Stage 1 equipment
    - small photofission pilot station
  => funding from national funds in 2024 and 2025

- Installation spaces to be made available in ~~Jan. 2025~~ => estimated to be ready in 2026
  => no time for a new building

- Install in the existing building hosting old cyclotron of IFIN-HH
  => decommissioning
    - has to be finished by ~~end 2023~~ – Plan approved by CNCAN, Permit not yet
    - funding request in preparation – Feasibility Study contracted
    - clean-up started (with internal funding) - ongoing
  => adaptations and seismically strengthening required ~~(in 2024)~~
    - prepare preliminary design as requested by national rules - done
    - funding request in preparation – submitted, design in 2023, work start in 2024

Implementation timeline



Feasibility Study for RIF@IFIN: structure

(ready to launch public tender ~ 200 kEuro)

Summer Version - 3 Phases

1. Cyclotron building consolidation and partial adaptation of building/utilities for LINAC and experiments

2. LINAC/GBS-Stage1 installation with all needed utilities and building adaptations and a simple experimental station

3. Full RIF@IFIN project implementation:
   - LINAC upgrade
   - all experimental equipment
   - additional building adaptations

Autumn Version – 2 Phases

1. Cyclotron building consolidation and partial adaptation of building/utilities for LINAC and experiments

2. Full RIF@IFIN project implementation:
   - LINAC dismantling from ELI-NP building, upgrading and reinstalling in cyclotron building
   - all experimental equipment
   - additional building/utilities

Notes: - Contract for Feasibility Study will be signed in January for a duration of 4 months
- LINAC installation in ELI-NP building does NOT require Feasibility Study

Next steps on the two line of actions in EGS – IFIN collaboration

➢ New project in old cyclotron building: complete Feasibility Study

- ❑ Cost estimate for:
  - Linac move and upgrade
  - Electron beamlines
  - Auxiliary systems for linac/access/safety
  - Experimental equipment ?
- ❑ Input for radioprotection calculation => optimize shielding, ventilation, etc.
- ❑ Conceptual design/better specification of some equipment

➢ Installation and commissioning of the linac in ELI-NP building

- ❑ Agree position of main equipment
- ❑ Design and draft Technical Specification for subcontracting:
  - cooling systems
  - power and signal cabling including cable trays
  - Laser cleanroom

  + see Work Breakdown
- ❑ Checks and tests of existing equipment

Thank you for your attention