ISOL@MYRRHA within the EURISOL-DF Context

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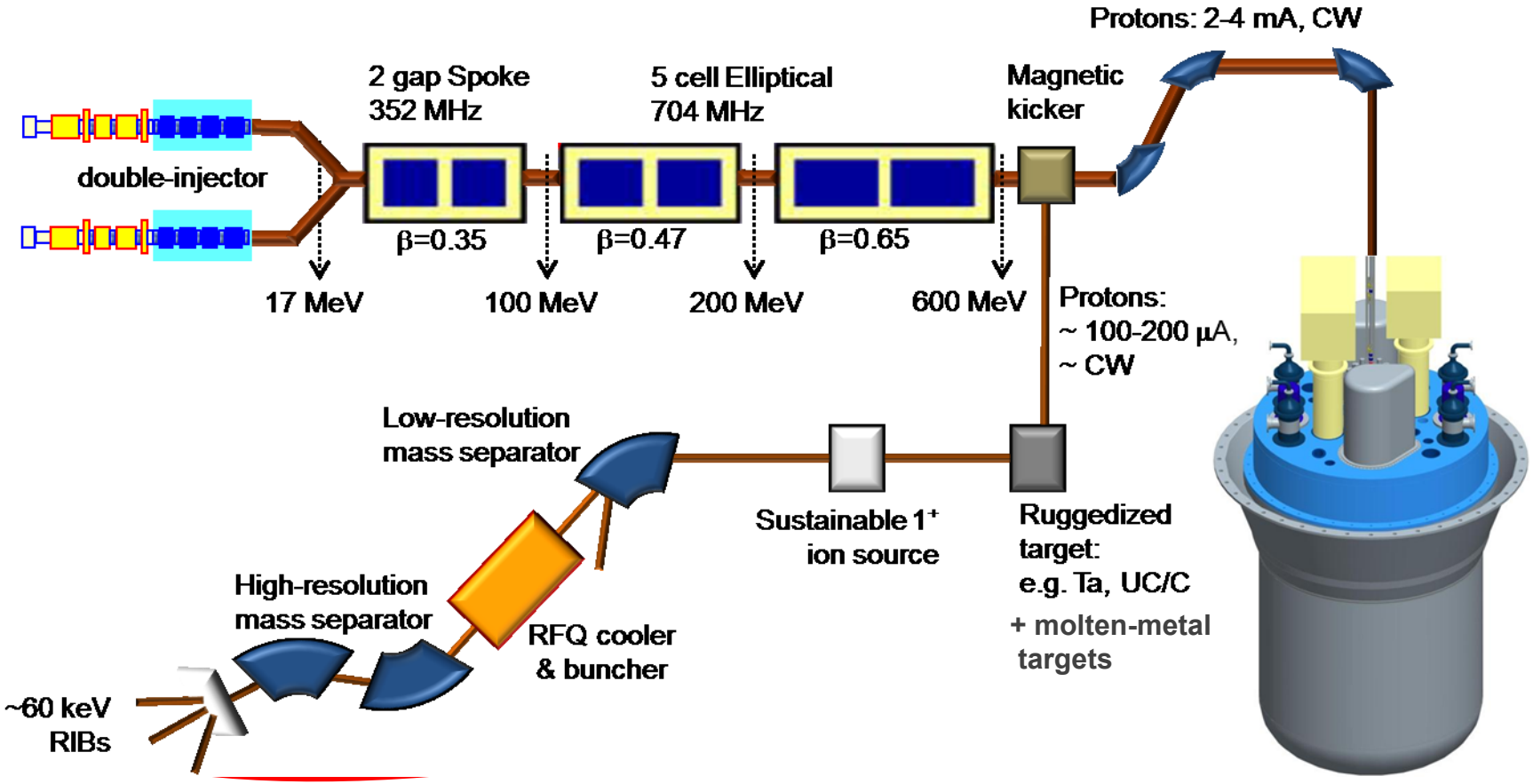
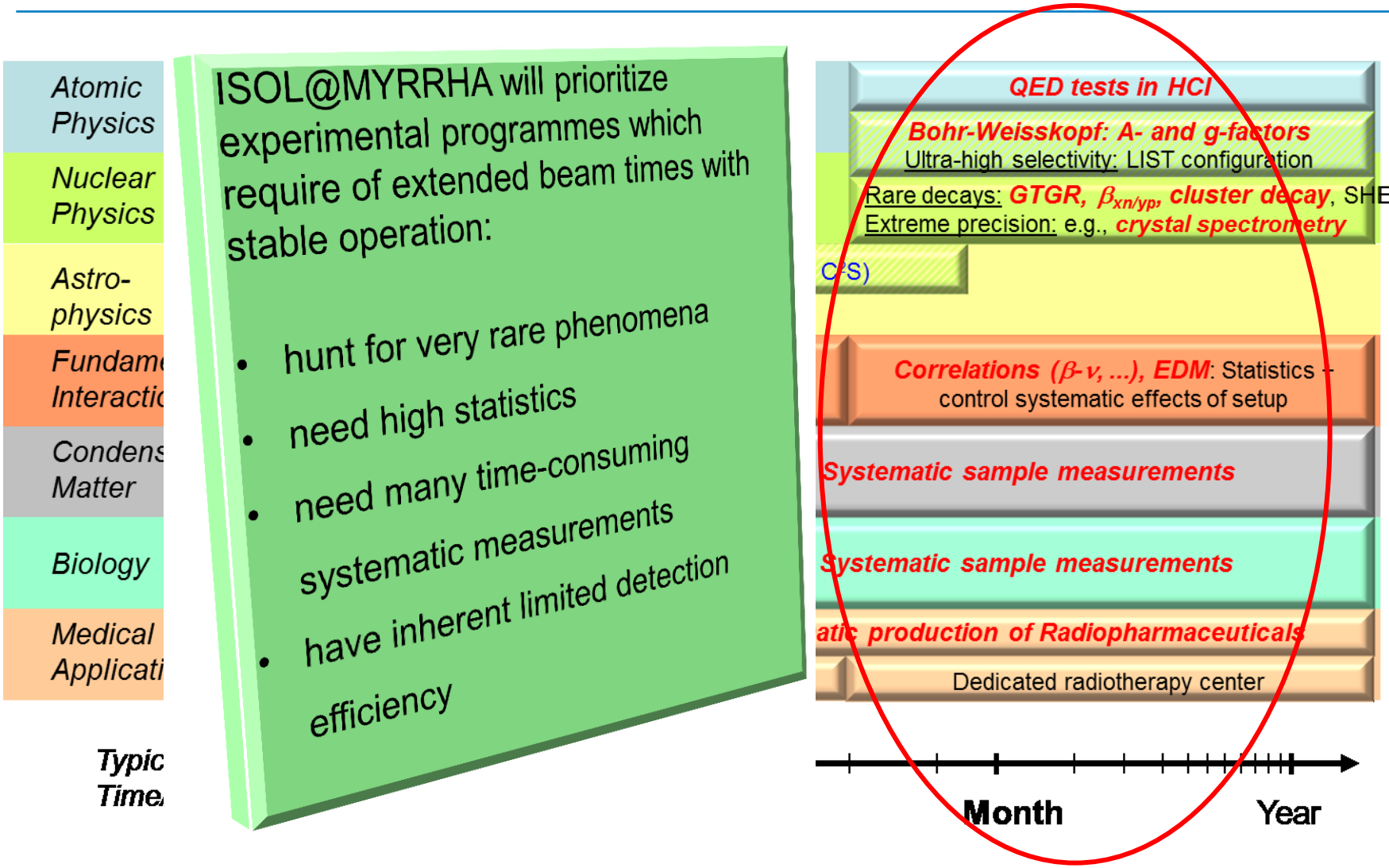
ISOL@MYRRHA - Concept



- Driver-beam power on ISOL@MYRRHA target: 60-120 kW
- Low-energy RIBs
- Experimental programme complementary to other ISOL facilities – long-run experiments

ISOL@MYRRHA Applications



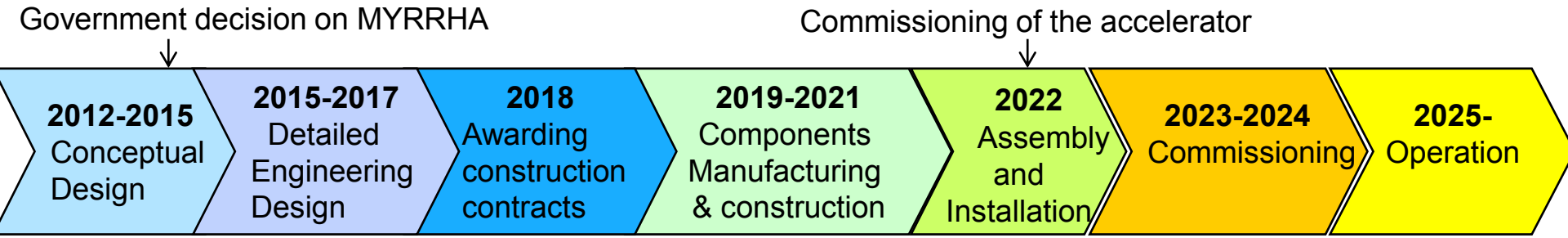
ISOL@MYRRHA Project

- ISOL@MYRRHA Feasibility Study
  carried out within BriX-IAP6 (2007-2012)

- Technical & Scientific report submitted to NuPECC
  ➔ 2010 – Technical Design of ISOL@MYRRHA in the NuPECC lrp

- Detailing the Design, updating the Scientific Case and building the Users Group through a series of topical workshops
  BriX-IAP7 (2012-2017)

Timeline



- MYRRHA included in the new Belgian Government Agreement (10 October 2014)

Belgian EURISOL Consortium

- Created in 2013
  - Aim:
    - Coordinated RTD programme – ISOL developments
    - Joining EURISOL collaboration (MOU signed in July 2014)

UNIVERSITEIT GENT | KU LEUVEN | Vrije Universiteit Brussel | ULB Université Libre de Bruxelles | BEL V | VKI | SCK•CEN Studiecentrum voor Kernenergie Centre d'Etude de l'Energie Nucleaire

- Chair: R. Raabe (KU Leuven)
- Vice-Chair: P. Planquart (VKI)

Potential Contribution of ISOL@MYRRHA to EURISOL-DF

High power direct targets development

- Highest proton-beam power on an ISOL target today:
  50 kW at TRIUMF-ISAC facility

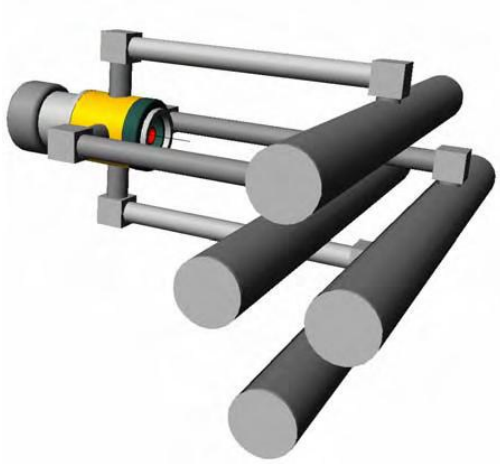
- Limited by thermal conductivity of target materials
- ISOL@MYRRHA will run at **60-120 kW** => new target design is needed

High power direct targets development

- Solid targets for ISOL@MYRRHA:

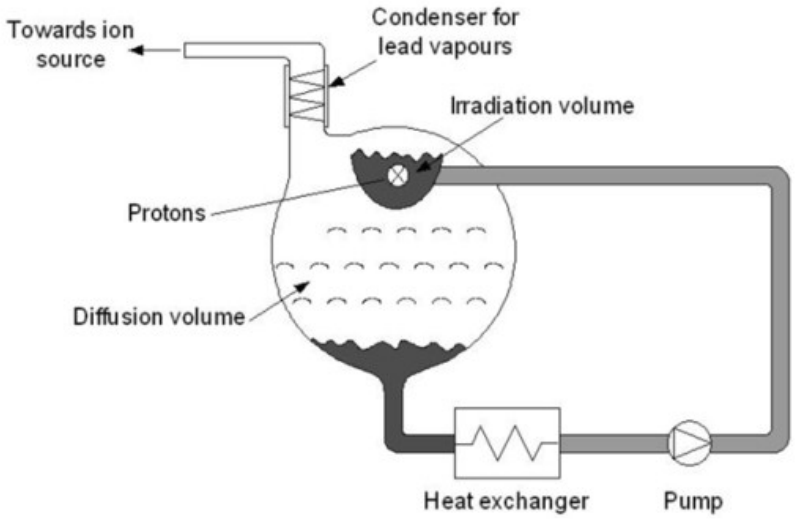
  - Targets based on ISAC design
    - refractory metal foils (e.g., Ta, Nb, Ti)
    - carbide powders sintered on a graphite sheet (e.g., ZrC/C, SiC/C)
      - UCx/C targets - fully exploited at ISOL@MYRRHA

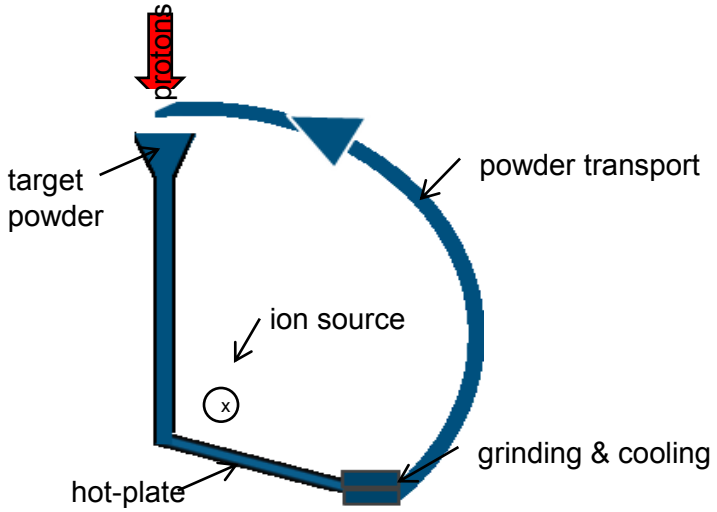
  - The concept for the EURISOL 100-kW solid target to be further developed



High power direct targets development

- Loop-type targets for ISOL@MYRRHA
  - Molten-metal targets
    E.g. LIEBE: Pb-Bi loop
  - Powder targets

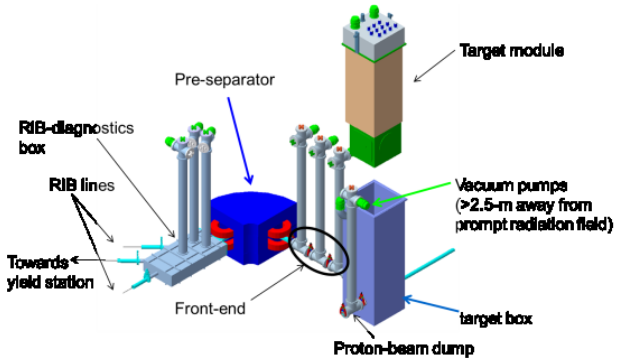


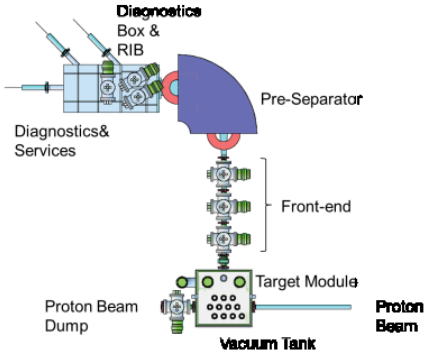


The two new concepts allow further increase of beam power on target

RIB production at ISOL@MYRRHA

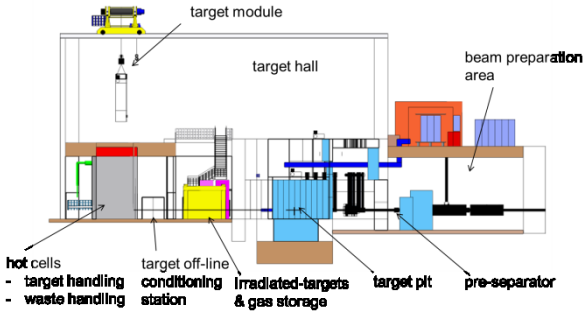
- Target-station design

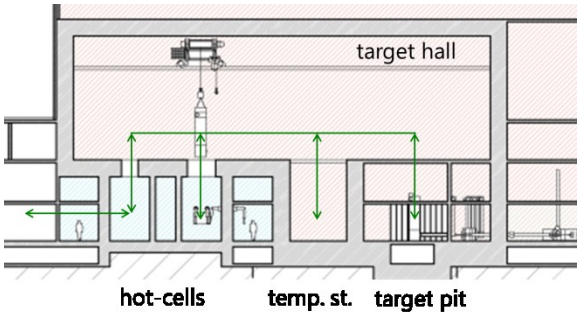


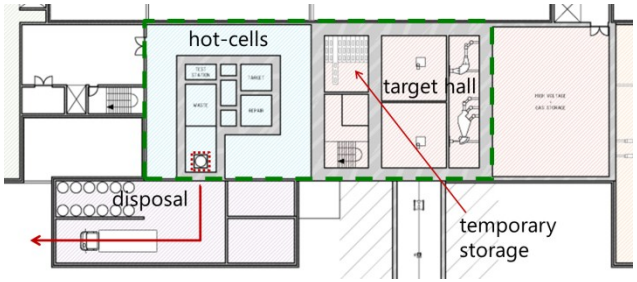


- Based on the concept at TRIUMF-ISAC
- New features:
  - vacuum connection at beam level
  - radiation resistant remote vacuum connection /disconnection for target exchange
  - vacuum-tight target box
  - reliable remote services connection and disconnection
  - remote maintenance, repair and exchange of the various components

- Target handling (concept similar to MYRRHA)







- Licensing

Contribution of ISOL@MYRRHA to EURISOL-DF - summary

- High power direct targets development:
  - Solid targets based on TRIUMF-ISAC design
  - Molten-metal targets
  - Powder targets

- Target-station design and operation procedure (shielding, remote handling, maintenance, waste handling and disposal, etc.)

+ Complementary physics programme