# ISOL@MYRRHA within the EURISOL-DF Context

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## ISOL@MYRRHA - Concept



Protons: 2-4 mA, CW

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

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## **ISOL@MYRRHA** Applications

ISOL@MYRRHA will prioritize Atomic QED tests in HCI experimental programmes which **Physics** Bohr-Weisskopf: A- and g-factors require of extended beam times with Ultra-high selectivity: LIST configuration Nuclear Rare decays: GTGR, β<sub>xn/yp</sub>, cluster decay, SHE **Physics** stable operation: Extreme precision: e.g., crystal spectron etry C<sup>2</sup>S) Astrohunt for very rare phenomena physics Fundame Correlations (*β*-*v*, ...), EDM: Statistics need high statistics Interactic control systematic effects of setup need many time-consuming Condens Systematic sample measurements Matter systematic measurements have inherent limited detection Biology Systematic sample measurements atic production of Radiopharmaceuticals Medical Applicati Dedicated radiotherapy center efficiency Typic Time, Month Year

## ISOL@MYRRHA Project

BriX

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



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)



- 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

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## **RIB production at ISOL@MYRRHA**



- 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)



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## 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