PRELIMINARY AGENDA
1. Present status of the project
2. White Book/Nuclear Physics program
3. Preparation of LoI for next INTC meeting (Feb 2020)
4. Beam dynamics, Magnets and Cryogenics
5. Next actions
6. AOB
1. Present status of the project

Collaboration

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2. IPNO, Univ. Paris-Sud, Orsay, France.  9. Univ. Edinburgh, United Kingdom.  16. ESS-BILBAO, Bilbao, Spain.
3. Univ. Liverpool, United Kingdom.  10. LNL-INFN Legnaro, Italy.  17. Univ. Aarhus, Denmark.
4. TTI Norte, Santander, Spain.  11. Uppsala University, Sweden.  18. Cockcroft Institute, Daresbury, United Kingdom.
5. IEM-CSIC, Madrid, Spain.  12. PARAGRAF, Somersham, United Kingdom.  19. Univ. West Scotland, United Kingdom.

Google-drive

Web-site
**Conceptual design**

*Superconducting Recoil Separator for HIE-ISOLDE*

To meet the physics program needs, a high-resolution recoil separator based on a **compact** superconducting (SC) mini-ring storage system has been proposed [1].

A proof-of-concept preliminary design features a $\Phi = 1.5$ m diameter ring built up of **multifunction SC magnets** [2] of $\delta = 25$ cm length (MFSCM) in a **Fixed-Field Alternating-Gradient (FFAG)** configuration. The MFSCMs should be able to withstand magnetic fields as high as 4 to 6 T. HTS materials and **cryocooler** systems are being considered in the design.

Reaction fragments circulate up to $\tau \sim 1 \mu$s being differentiated by their cyclotron frequency. Various techniques of operation are under study.

In the simplest mode, the ions are extracted, identified and quantified in a focal plane detector by **Time-of Flight (ToF)** and **Energy Loss in Gas - Si detectors**. Digital Pulse Shape Analysis (DPSA) techniques will help to deal with the most challenging cases. Preliminary beam dynamics studies are ongoing [3].

**Simulated example**

d($^{233}\text{Ra},^{234}\text{Ra})p$ @ 10 MeV/u

$^{233}\text{Ra},^{234}\text{Ra}$ - ToF separation ~ 40 ns (10 turns)

## Project participants – Design study - EU application 2020

1. CSIC-MADRID, SPAIN
2. UNIVERSITY OF HUELVA, SPAIN
3. UKRI-STFC, UK
4. ISOLDE-CERN, CERN, SWITZERLAND
5. UNIVERSITY OF LIVERPOOL, UK
6. COCKCROFT INSTITUTE, UK
7. UNIVERSITY OF LUND, LUND, SWEDEN
8. CENBG, BOURDEUX, FRANCE
9. UNIVERSITY OF WEST SCOTLAND, UK
10. UNIVERSITY OF AARHUS, DENMARK
11. UNIVERSITY OF UPPSALA/FREIA, SWEDEN
12. ESS-BILBAO, SPAIN

### WP1 Project Coordination and Management
- T2.2 Project Coordinator and management
- T2.3 System specifications and selection of technologies

### WP2 System specifications and selection of technologies
- T2.2 Physics case/White book
- T2.3 Conceptual design and critical components

### WP3 Design study of the spectrometer
- T3.1 Beam dynamics FFAG
- T3.2 Beam transport development
- T3.3 Beam transport (SEC)
- T3.4 Multiharmonic buncher
- T3.5 Solid State Power Amplifier
- T3.6 Re-buncher
- T3.7 RF and LLRF systems
- T3.8 Superconducting multifunction magnet design
- T3.9 Magnetic probes
- T3.10 Magnet test bench design
- T3.11 Injection/extraction system
- T3.12 Cryostat, cryogenic system, control
- T3.13 Standard beam instrumentation
- T3.14 Specialized beam instrumentation
- T3.15 Safety: machine protection
- T3.16 Safety: personal protection
- T3.17 Budget and timeline

### WP4 Design study of physics detectors
- T4.1 Focal plane detectors and ancillary systems
- T4.2 Control system and DACQ for physics detectors

### WP5 Construction of prototypes
- T5.1 Beam transport line
- T5.2 Multiharmonic buncher
- T5.3 Solid State Power Amplifier
- T5.4 Multifunction magnets
- T5.5 Magnetic probes
- T5.6 Magnet test bench
- T5.7 Cryostat, cryogenic system, control
- T5.8 Integration/preliminary test

### WP6 Local systems, integration and installation
- T5.1 Standard beam instrumentation
- T5.2 Vacuum systems
- T5.3 Integration mechanical systems
- T5.4 Installation
- T5.5 Safety

### WP7 Prototype evaluation
- T7.1 Testing plan and initial machine studies
- T7.2 Integration control systems
- T7.3 Hardware commissioning
- T7.4 Stable beam commissioning
- T7.5 Radioactive beam commissioning
- T7.6 Initial operations
- T7.7 Data acquisition software
- T7.8 Data analysis

### WP8 Exploitation and dissemination
Calendar (previous version)

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Budget for design study

- 3 Meuro max.
- Participants should finish uploading costs
- CERN budget

- Delay: several meetings to improve definition and scope during previous 2 months
- Physics cases
- Calendar of deliveries must be shifted forward by ~ 8 weeks ~ April 2020
2. White Book/Nuclear Physics program

Contact: Teresa Kurtukian-Nieto, CENGB, Gradignan, France.

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<td>Giacomo d'Angelis INFN-LNL</td>
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3. Preparation of LoI for next INTC meeting (Feb 2020)

In addition to the ongoing review of status reports at ISOLDE, the INTC is requesting **letters of intent** for new experiments or collaborations which intend to **occupy space in the ISOLDE hall** in the coming years or for existing experiments that intend to increase their current **space allocation**.

These letters should indicate **future plans** with a summary of **expected space requirements** along with a brief indication of the future **physics programme** and the **status** of the current collaboration. They should be **5-6 pages maximum**. In general letters of intent do not require a presentation to the committee. If, in special cases it is judged necessary, the spokesperson will be contacted in advance of the meeting.

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ISOLDE and Neutron Time-of-Flight Experiments Committee (INTC)

**Dates for 2020**

- Wednesday and Thursday, 5-6 February
- Wednesday and Thursday, 1-2 July
- **Tuesday and Wednesday**, 3-4 November
4. Beam dynamics, Magnets and Cryogenics

WP2: Baseline design

- Connection from beampipe (~4K) to outside (~300K)
  - Common vacuum (HIE-ISOLDE ctostats)
  - High thermal-resistive connection (LHC)
- Test LHe and Cryocooler option
- Magnets: Q + D
- Beampipe diameter: 110-150 mm
- Dipole strength: 1.5 Tm
- Quadrupole strength: 40 T/m
- Max peak field: 5 T
- Typical magnet geometry:
  - Total length 500 mm
  - 3 magnets, in series, Bending angle 30°
  - Common cryostat
  - R= 1 m
  - Max outer diameter (including shielding): 650 mm
- FFAG Cosine canted coils
5. Next actions

- Lol for INTC
- Meet with CERN

6. AOB