



# ISOLDE report INTC 78



**ISOLDE**

February 2025 - Hanne Heylen

# INTC 78 summary

Row Labels	Count of Title	Sum of Shifts	Sum of Protons
<b>ISOLDE</b>	<b>13</b>	<b>158</b>	
Addendum	1	14	
Letter of Clarification	2	21	
Letter of intent	5	18	
Proposal	5	105	
<b>nTOF</b>	<b>5</b>		<b>2,65E+19</b>
Letter of Clarification	1		1,5E+18
Proposal	4		2,5E+19
<b>Grand Total</b>	<b>18</b>	<b>158</b>	<b>2,65E+19</b>

Supposed to be dedicated HIE-ISOLDE meeting with few exceptions, but only 3 HIE-ISOLDE proposals and 2 Lols.

### General comment Technical Advisory Committee for ISOLDE

The current performance of the 7-gap amplifiers in the post-accelerator restricts the acceptable A/Q ratio and, consequently, put constraints on the beam's charge state.

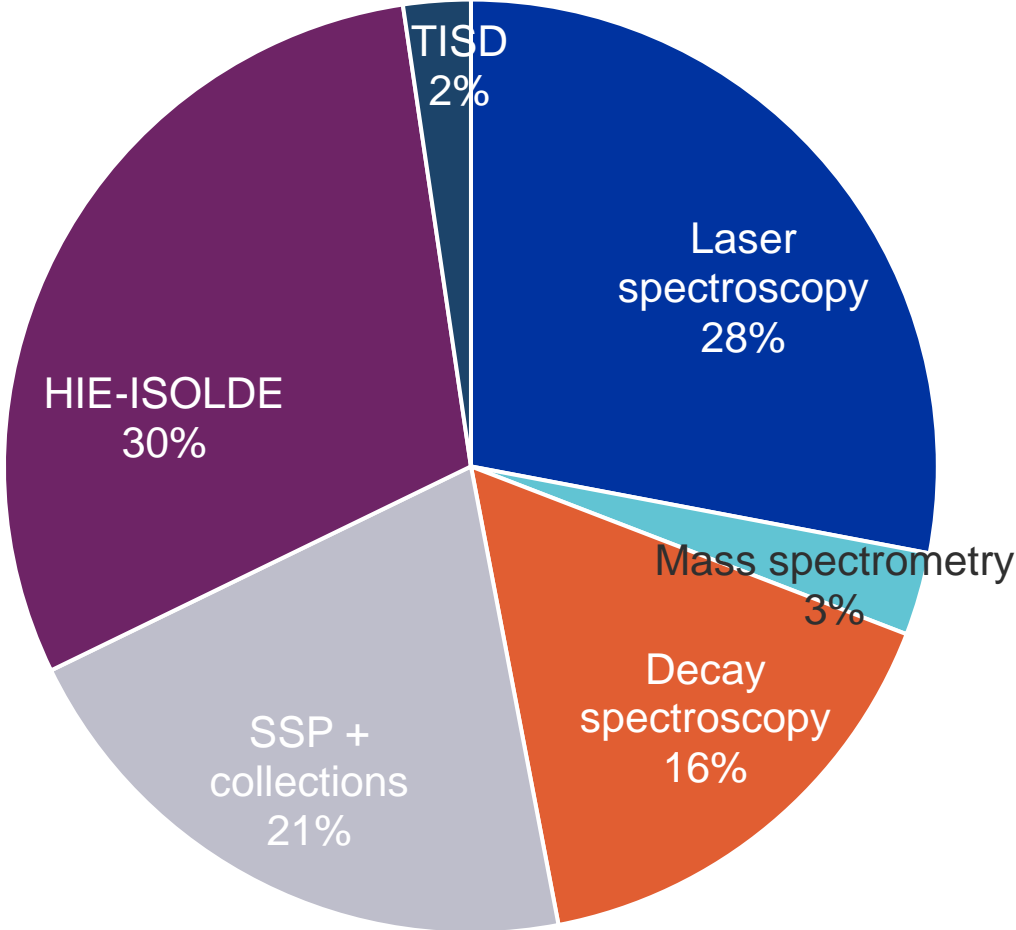


1 shifts = 8 hours; 1 day~ 1 x 10<sup>17</sup> protons

# ISOLDE – beam requests 2025

	Number of requests	Shifts
<b>Low E</b>	<b>92</b>	<b>782</b>
COLLAPS	4	32
CRIS	10	170
GHM	6	19,5
GLM	36	212,5
IDS	9	94
In-source	6	70,5
ISOLTRAP	3	32
TAS	5	34
TISD	4	26
Traveling setup	3	34
VITO	5	39,5
WISArD	1	18
<b>HIE -ISOLDE</b>	<b>23</b>	<b>333</b>
ISS	9	160
Miniball	10	117
XT03	4	56
<b>Total</b>	<b>115</b>	<b>1115</b>

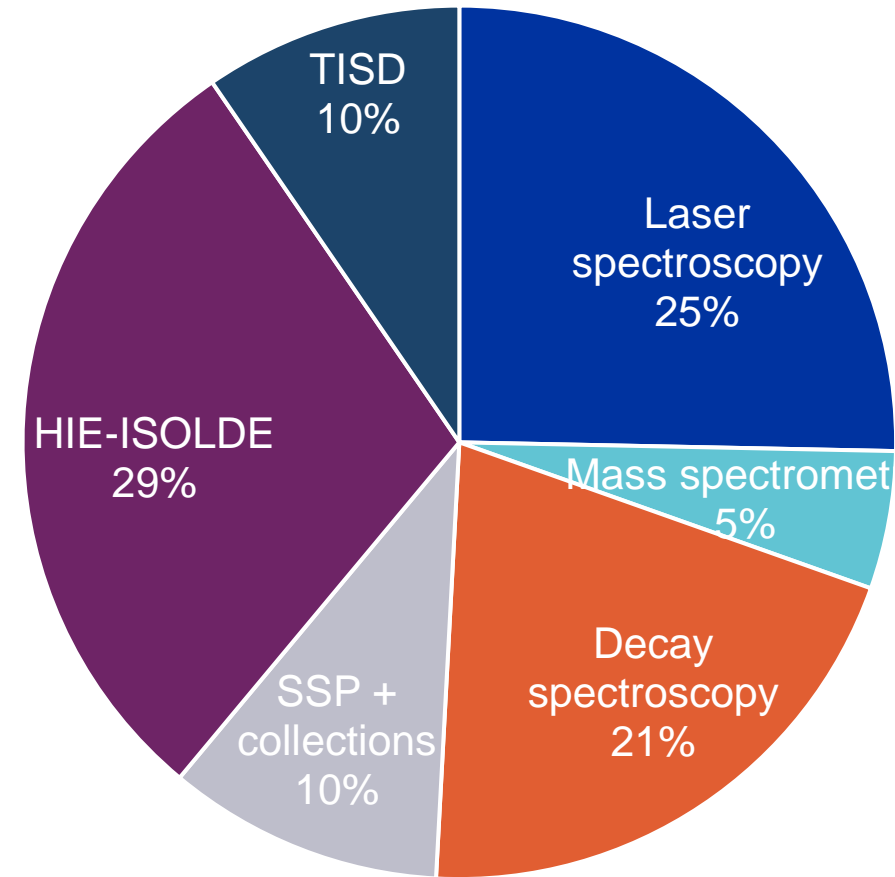
Requested shifts per category



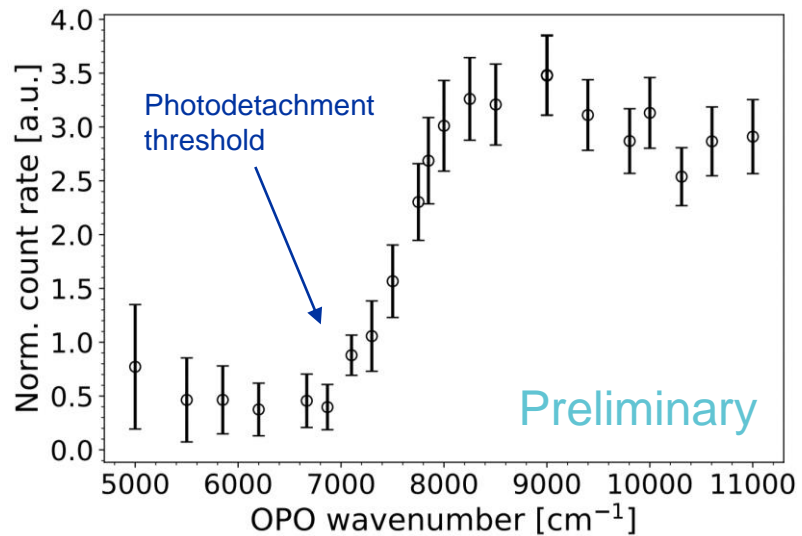
# 2024 statistics

- Beams were delivered to **44 distinct** IS/LOIs (9 HIE-ISOLDE)
- A total of **426 shifts** were delivered for physics, beam development and ad-hoc measurements
- RILIS was used in just over 50% of cases, while molecular beams were used for 20% of the delivered beams

ISOLDE Beam pie 2024

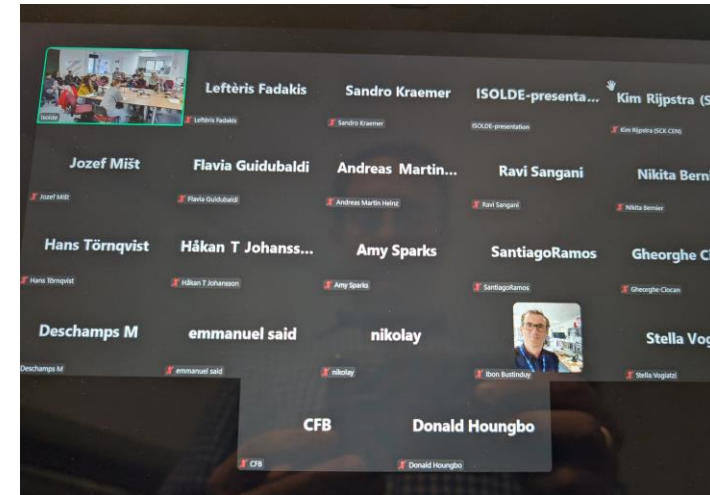


# Highlights 2024



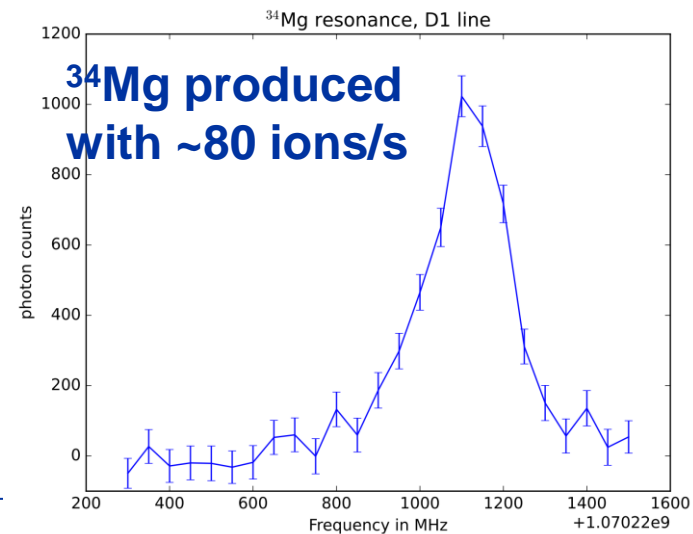
## IS671 – <sup>34</sup>Mg @MIRACLIS

- First collinear laser spectroscopy measurements of exotic isotopes in a MR-ToF device. This device allows to repeatedly probe the same ions during the >1000 revolutions and hence significantly increase sensitivity
- Used **1.7 GeV** protons to increase yields (2024 1<sup>st</sup> year with 1.7 GeV production runs)



## IS758 - Study of RaF<sup>-</sup> anions at CRIS

- The production of RaF<sup>-</sup> is a promising method for decelerating and trapping molecules, followed by laser photodetachment to provide cold, slow neutral molecules for future high precision studies
- Negative **RaF<sup>-</sup> anions successfully produced** through double charge exchange process at CRIS
- First **laser photodetachment of RaF<sup>-</sup> was observed** and its threshold determined



- Separator course followed by 12 people in person, and around 30 online participants
- Recording: <https://cernbox.cern.ch/s/w4CRKtv2D1mTAmI>

# Key dates

## 2025

- Protons for low energy physics - **March 28th**.
- Physics for HIE ISOLDE is expected to started around **June 13th**.
- Protons will stop for ISOLDE on **December 8th**.
- Potentially, there will be a short winter physics campaign (details TBC)

*Note: LS3 for ISOLDE: no physics in 2026 and 2027, restart in Q2 2028  
(not aligned with LS3 for LHC)*

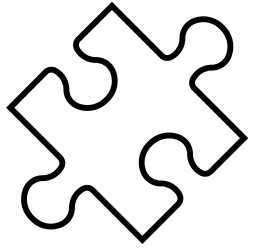
# Scheduling ...

- ~50 experiments per year
  - Typically, 1 day up to 1 week
  - **Sequential** scheduling (parallel only for GLM/GHM)
  - **During working hours:** target changes, separator setup, yield checks, RILIS optimisation, HIE-ISOLDE setup, ...
  - Irradiations for “Winter physics”
  - No fast switching between between GPS and HRS (yet) → **central beam line bottleneck**
  - Unforeseen problems, Machine Developments (MD), ...
- Limited amount of targets can be produced each year
  - ~30 targets <> 50 experiments + additional constraint on actinide targets
  - A lot of work on top of the visible “online work”: production, testing on offline separators, disposal, ... (50kCHF)
  - LIST: more elaborate to produce and operate.

Take away message: squeezing in a few shifts impacts more than you might think!

		ISOLDE WEEK 46					
		RILIS	GPS	HRS	CAO	MEDICIS - HRS	p's
Monday	11-11	night	Stop 9:30				
		AM		Setup + tune to IDS (50 keV)	HRS		ISOHRS
		PM		proton scan + yield checks			
				IS694 - 80,82Y			
Tuesday	12-11	night					
		AM		Continue yield checks (? 76Sr, LOI259 - 74Rb)		8:30 Sample on high trolley	
		PM	15:00 #878-MK1(Ta)			Indirect (0,0)	
				IS694		16:30 retrieval	
Wednesday	13-11	night					
		AM		Setup to MIRACLs		8:30 Installation	
		PM	Stable beam tuning	Stop 8:30	Quad scans to RC6		Direct (-10,-63), 1 uA max
				14:00 (TBD) #874-ThC or #877			
Thursday	14-11	night					
		AM		Proton scan+ yield checks (1.4/1.7 GeV)		8:30 Retrieval	
		PM		IS671 - 34Mg - MIRACLs - 20 keV	GPS		
Friday	15-11	night					
		AM	Mg	IS671 - 34Mg - MIRACLs - 20 keV			ISOGPS
		PM					
Saturday	16-11	night					
		AM		IS671 - 34Mg - MIRACLs - 20 keV			
		PM					
Sunday	17-11	night					
		AM		IS671 - 34Mg - MIRACLs - 20 keV			
		PM					
Monday	18-11	night	Stop 9:30				
		AM	Switch to Be	(TBD) MD for REXTRAP?		Cold irradiation for winter physics	
		PM				(TBD) aim for ~1 E18 more?	ISOHRS

# Scheduling ...



## Criteria which improve scheduling chances

- Priorities determined by experimental collaborations (PhD students, funding, scientific interest, ...)
- Beam for as many groups (>< collaborations) as possible
- From summer onwards, priority to HIE-ISOLDE runs (typically, alternate with Low E)
- Groups affected by suspension of GLM/GHM in 2024
- Synergies with other runs (same target-ion source, same RILIS scheme, ... )

## Criteria which reduce scheduling chances

- Exotic targets, especially if only requested for very few shifts
  - LOI situation is difficult!
  - Runs cannot be scheduled before yields have been confirmed (if requested by INTC)
- Genuine concern about feasibility (old runs) and/or safety (TAC comments, ...)
- Unclear beam request (need to spend too much time to understand history, requirements, ...)
- Little flexibility in terms of availabilities



# Announcements

- Crane activities for users is allowed again (under certain conditions)
- New technician hired – expected to start in March.
- Changes in radioactive source management – storage location will be modified and a Source Responsible will be appointed per installation.
- Activities in GLM/GHM area are allowed again