

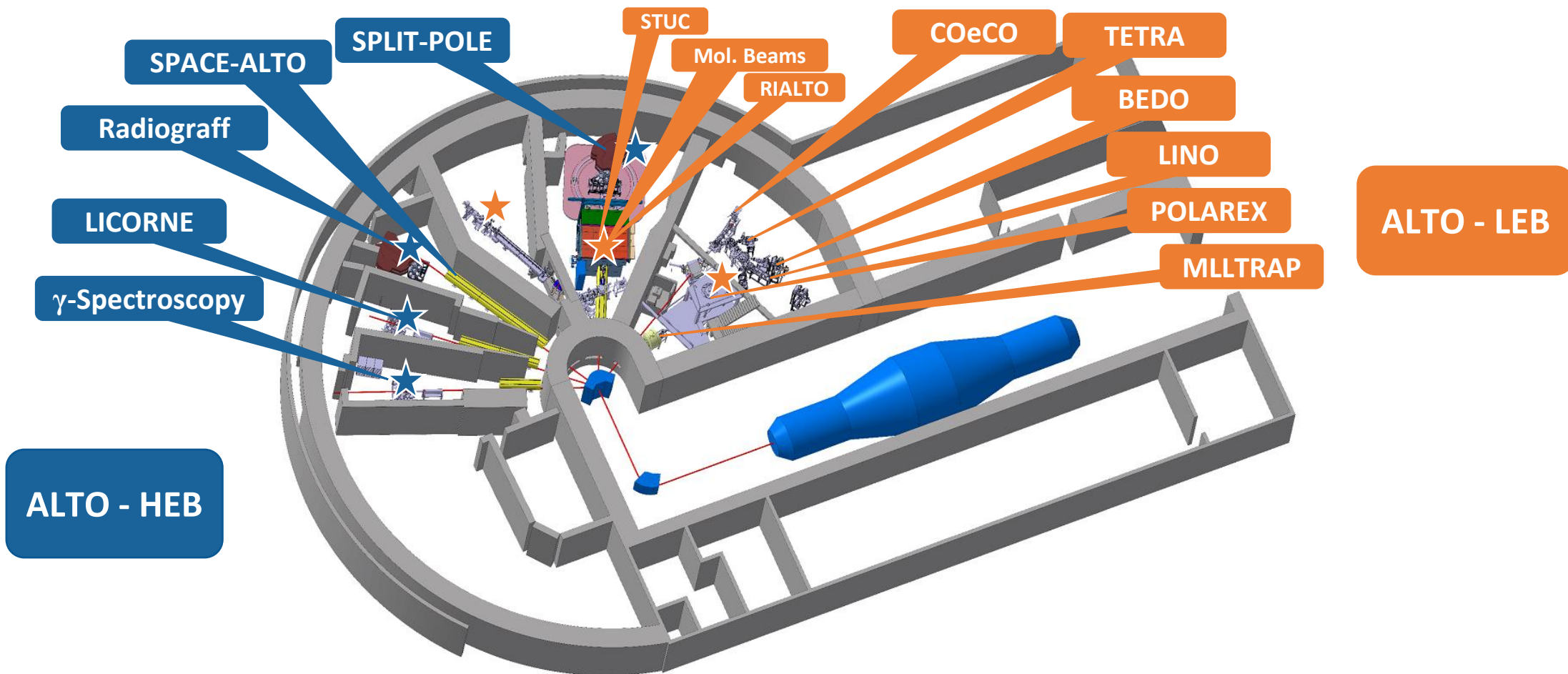
# Operation at ALTO

Workshop on R&D for new ISOL beams (SPIRAL 1 and ALTO)

**Florian Lemaître, IJCLab**



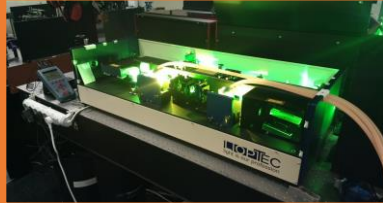
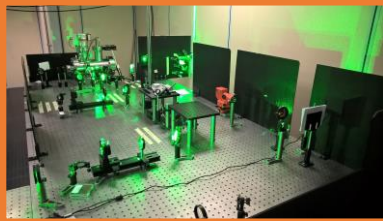
# Research instrumentation and R&D supported by ALTO





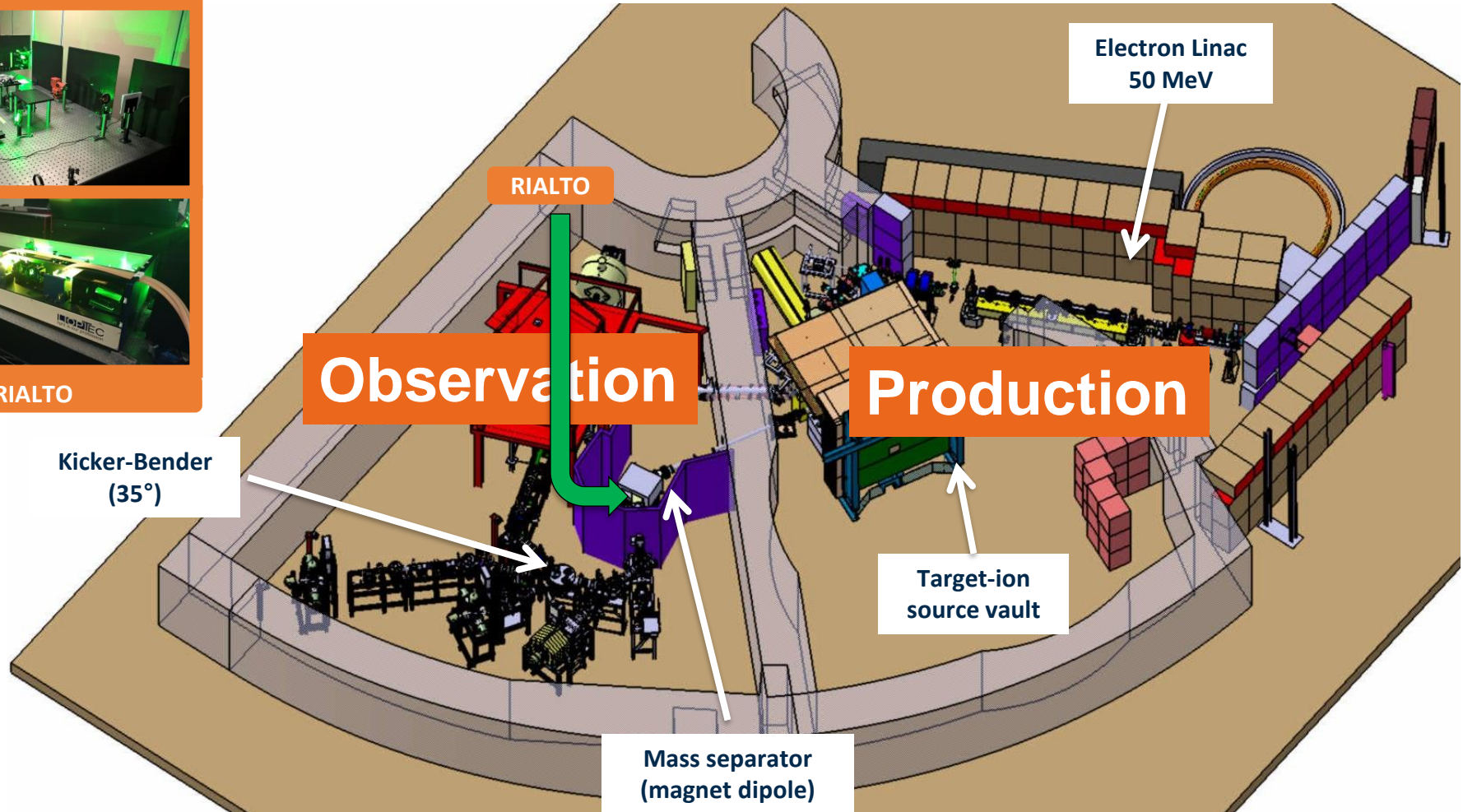
# General presentation of the platform

AL



RIALTO

Kicker-Bender  
(35°)



Electron Linac  
50 MeV

RIALTO

Observation

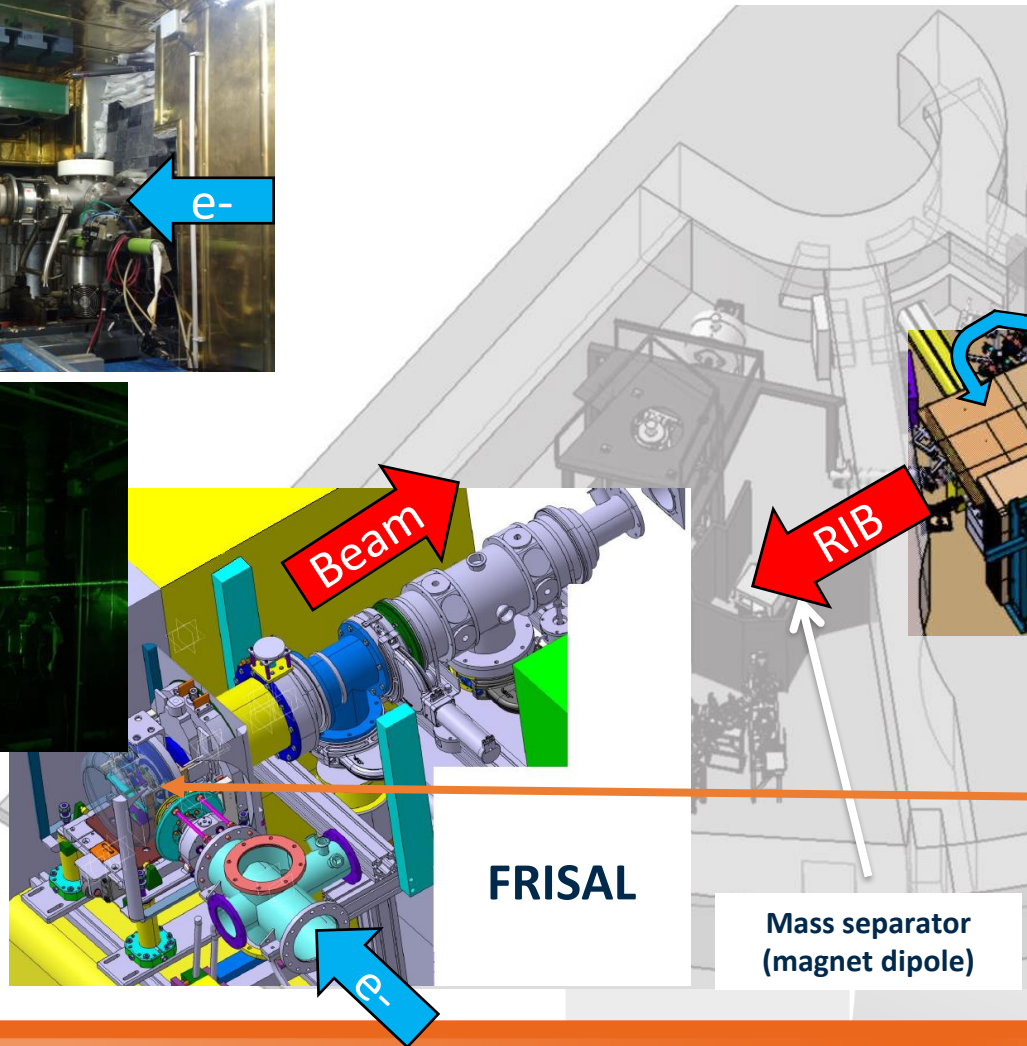
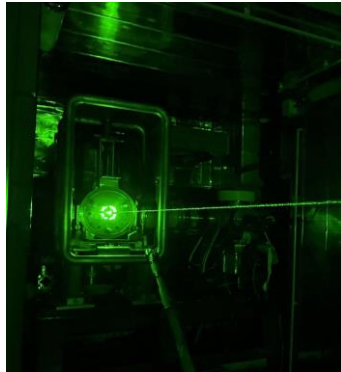
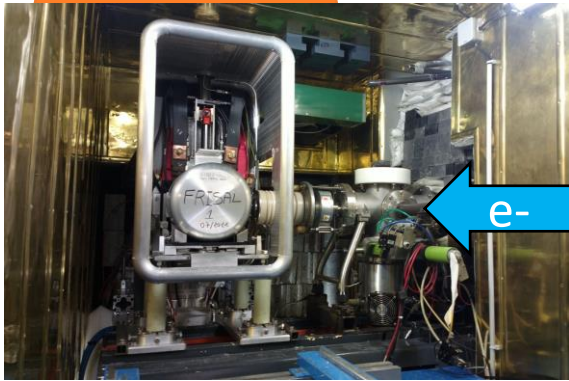
Production

Target-ion  
source vault

Mass separator  
(magnet dipole)



# General presentation of the platform



■ Accessible elements  
▼ Observed elements  
▼ Laser scheme tested with radioactive beams  
▼ Laser scheme in preparation

1																	2				
H																	He				
3	4															5	6	7	8	9	10
Li	Be															B	C	N	O	F	Ne
11	12															13	14	15	16	17	18
Na	Mg															Al	Si	P	S	Cl	Ar
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
55	56	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86					
Cs	Ba	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn					
87	88	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118					
Fr	Ra	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og					
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71							
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu							
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103							
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr							

<https://alto.ijclab.in2p3.fr/en/facility/alto-leb/production/>

Target-ion source vault





## • Objectives of phase 1

- Increase Frontend reliability for RIB production
- Upgrade of the RIB acceleration from 30 kV to 60 kV
- New Frontend mechanics adapted to the robot
- 2023 upgrade of high power cables  
→ stability of the temperature applied on the oven



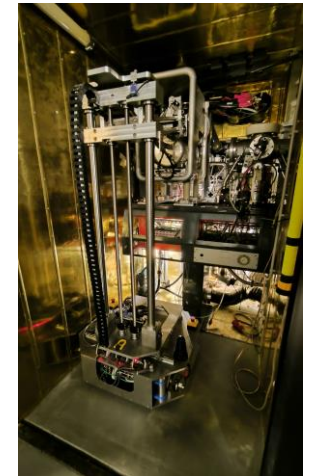
2019



October 2022 : online commissioning

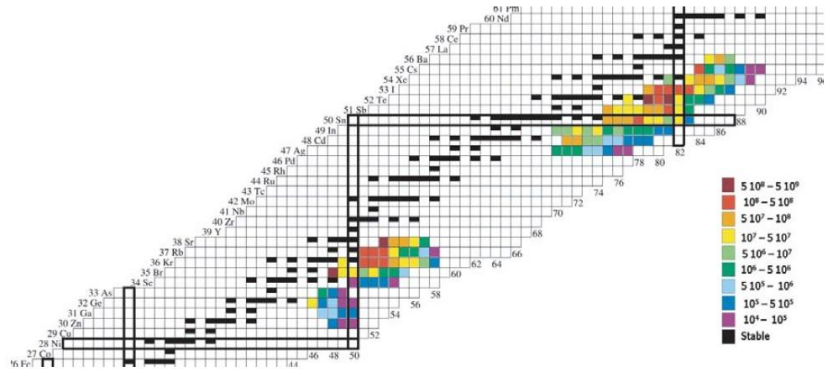
## • Objectives of phase 2

- Implementation of the Robot at ALTO-LEB
- Increase the number of RIB experiments
- 2023 : main movements validated  
→ advanced tests at ALTO
- Summer 2024 : first test in area of the target-ion source vault





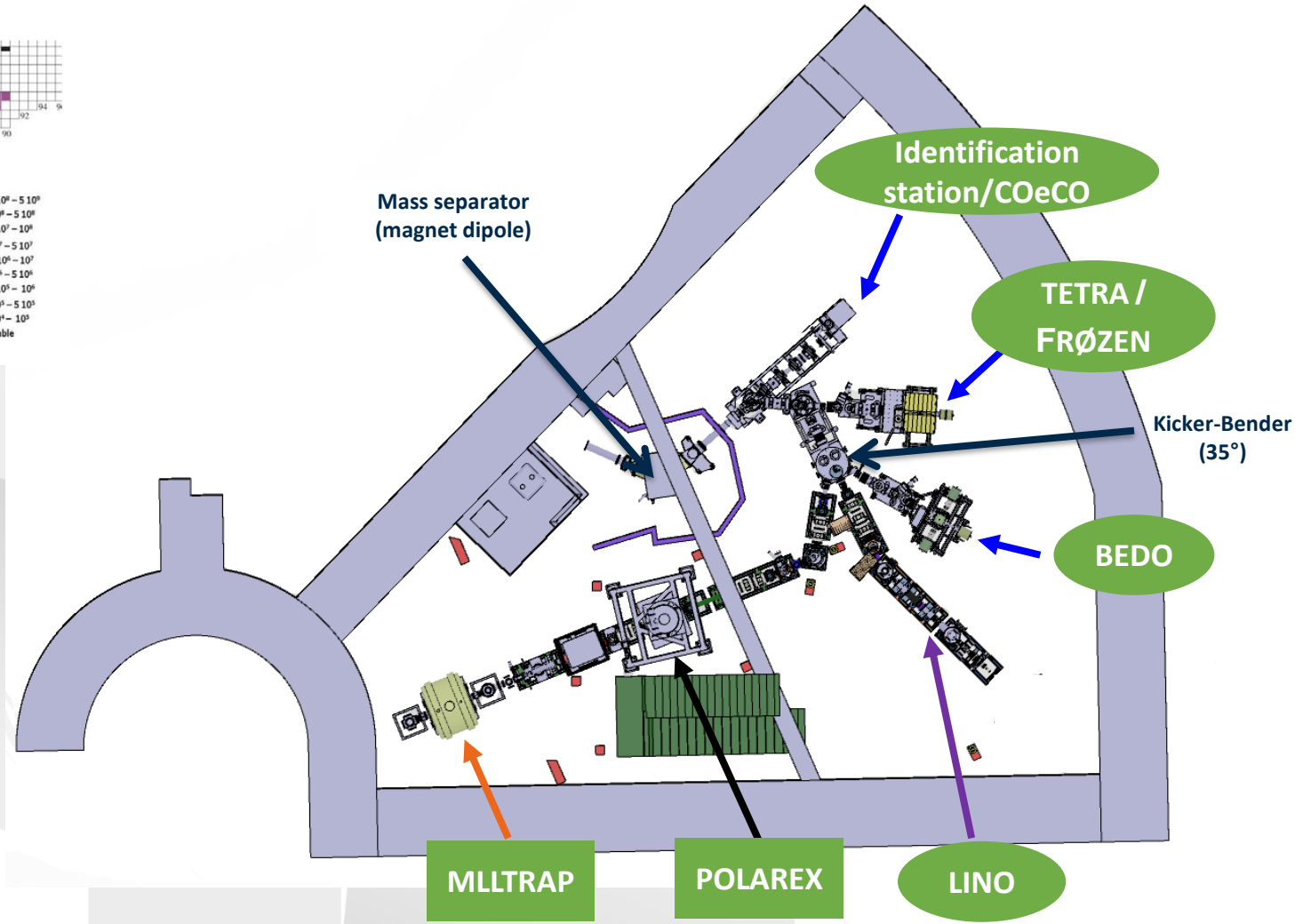
# ALTO-LEB : observation



Nuclear structure studies of niche cases  
→ currently 6 experiments at ALTO-LEB

They allow measuring nuclear fundamental properties of ground and long-lived isomeric states.

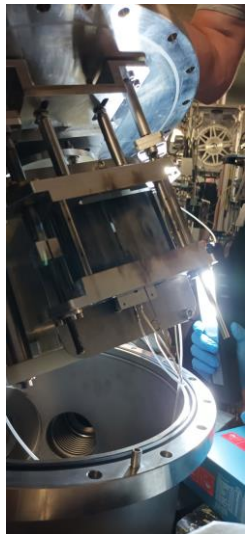
Access to fundamental observables  
[ $I$ ,  $\mu$ ,  $Q_s$ ,  $\delta\langle r^2 \rangle$ ,  $B(N,Z)$ ,  $\beta$  decay spectroscopy]  
to test state-of-the-art nuclear theories



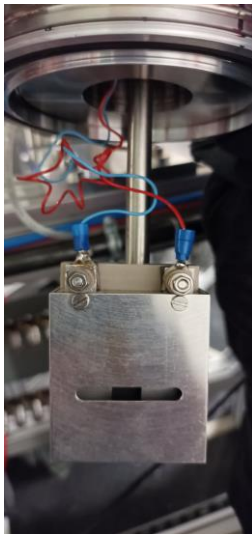


# ALTO-LEB : Beam transport

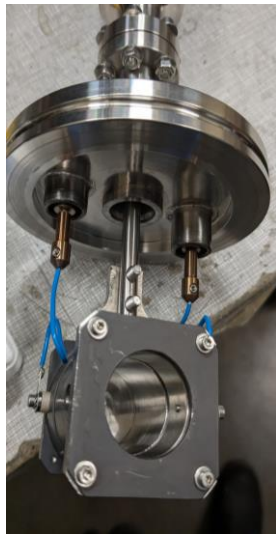
Different shapes for Faraday cups



CF2



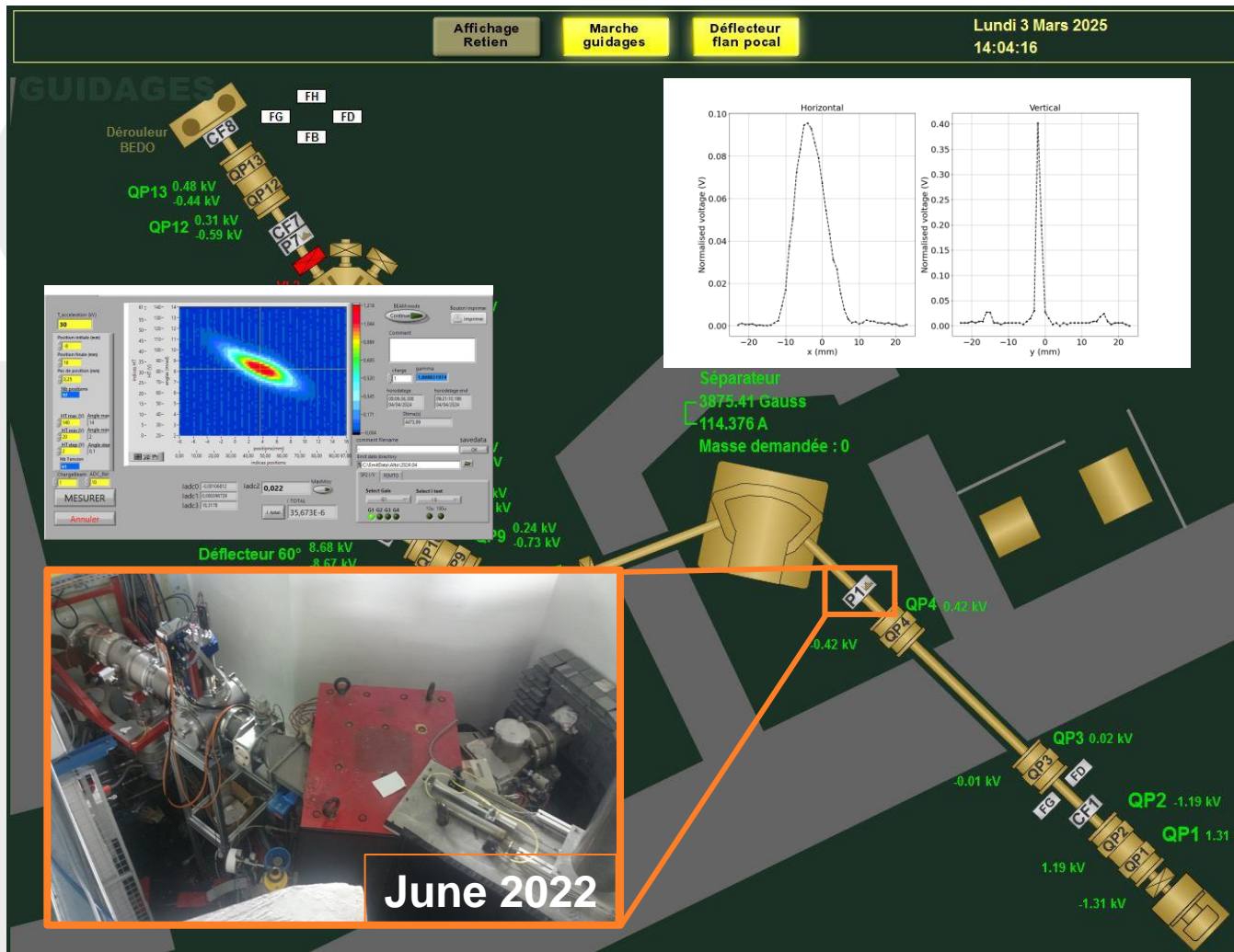
CF6



CF3

## Objectives

- Standardize and optimise the beamline diagnostic system
- Automatiser of the beam transport thank to AI





Thank you for your attention !

Do you have any questions ?

If not yet.

Available at:

- Coffee breaks
- Lunch
- Everywhere you see me