



GOBIERNO
DE ESPAÑA

MINISTERIO
DE CIENCIA, INNOVACIÓN
Y UNIVERSIDADES



CSIC IEM



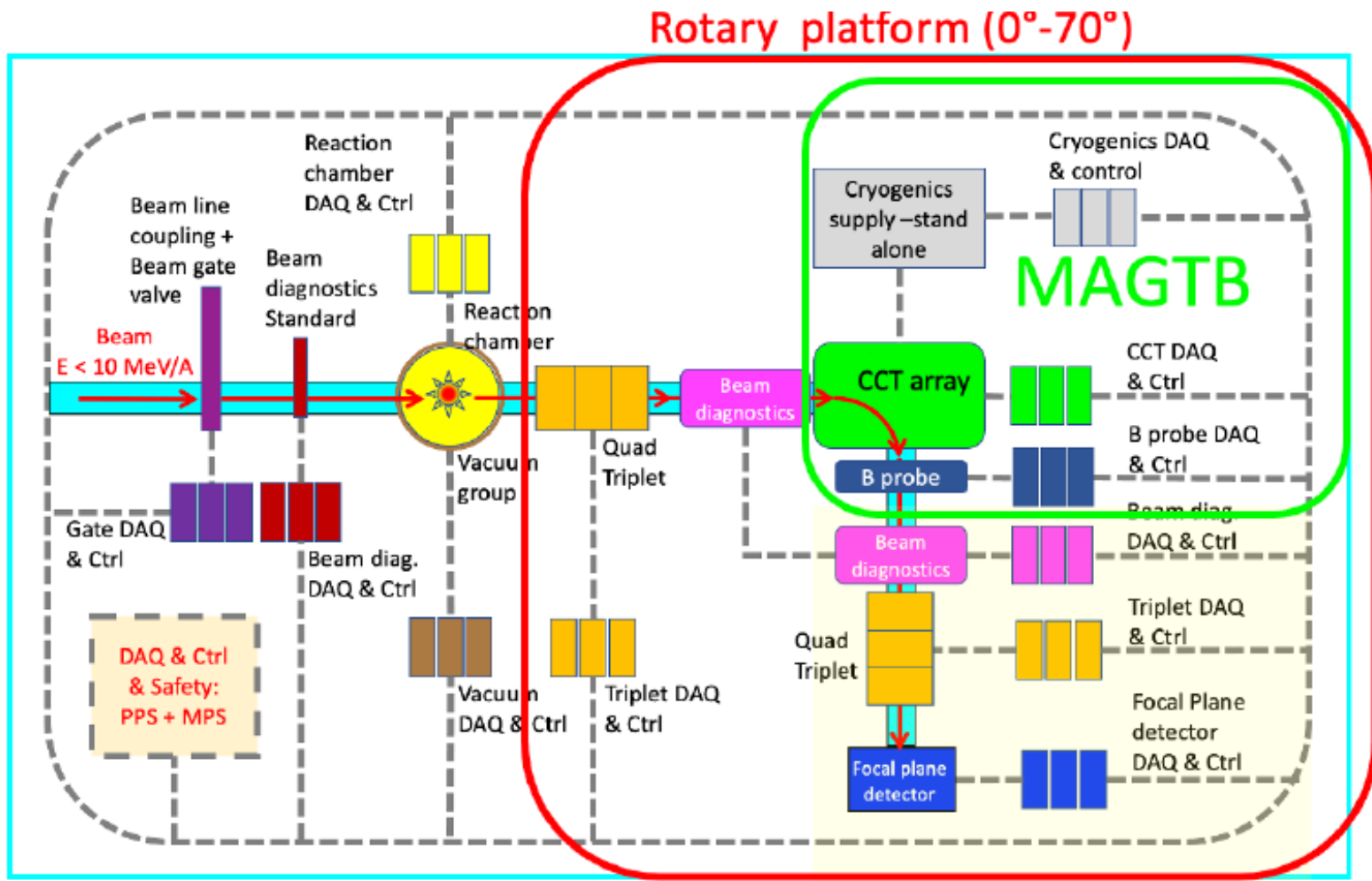
MAGDEM focussing system and elements of focal plane

Taks 2.3 and 2.5 ISRS-SPAIN

Teresa Kurtukian Nieto
IEM-CSIC

November 27th 2023

Ion test-bench: IEM contribution



Task 2.3 MAGDEM focussing system

Teresa Kurtukian-Nieto

- ✓ Reaction chamber
- ✓ Quadrupole magnets
- ✓ Beam diagnostics
- ✓ Vacuum system

Task 2.5 Prototypes of critical elements of focal plane

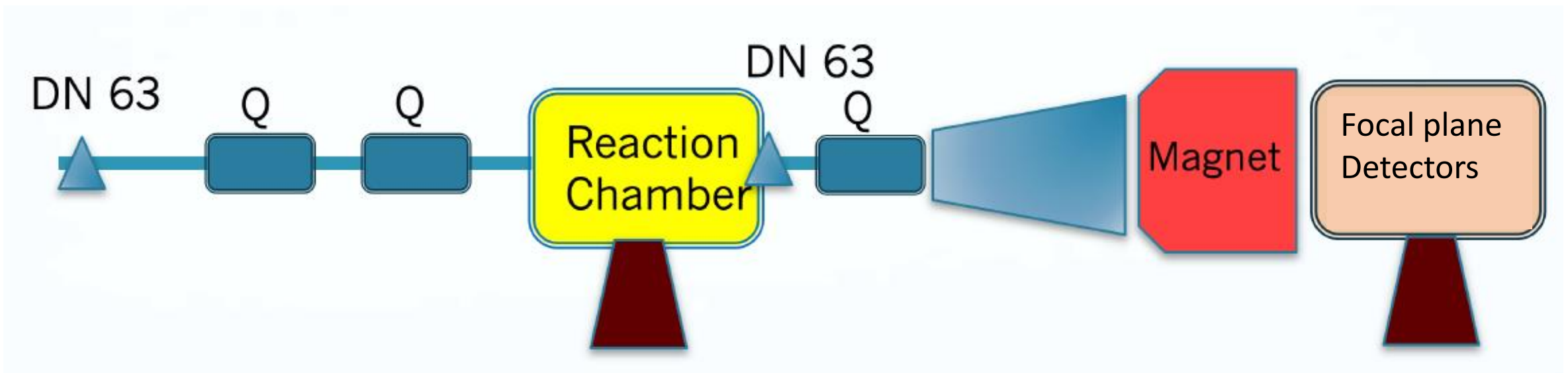
Olof Tengblad

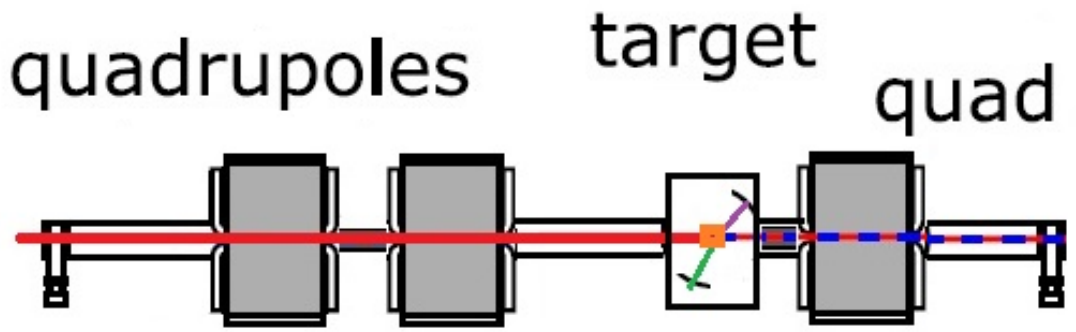
Team:

- Acosta, Luis
- García Borge, Maria José
- Kurtukian-Nieto, Teresa
- Perea, Angel
- Tengblad, Olof
- + 2 postgraduates, 1 PhD

Madrid test-bench:

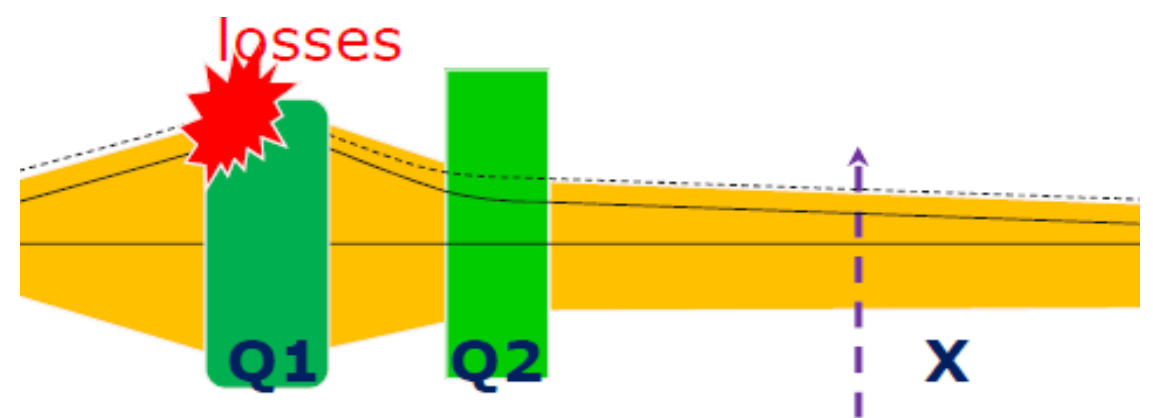
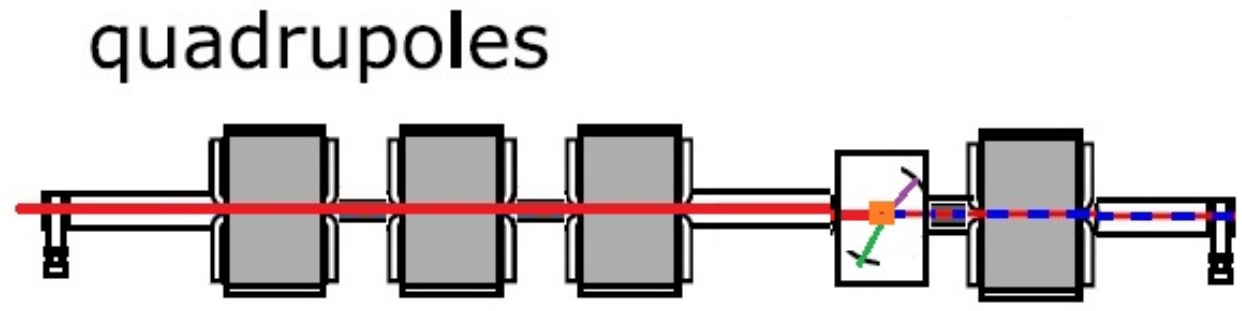
Simplest configuration for linear spectrometer





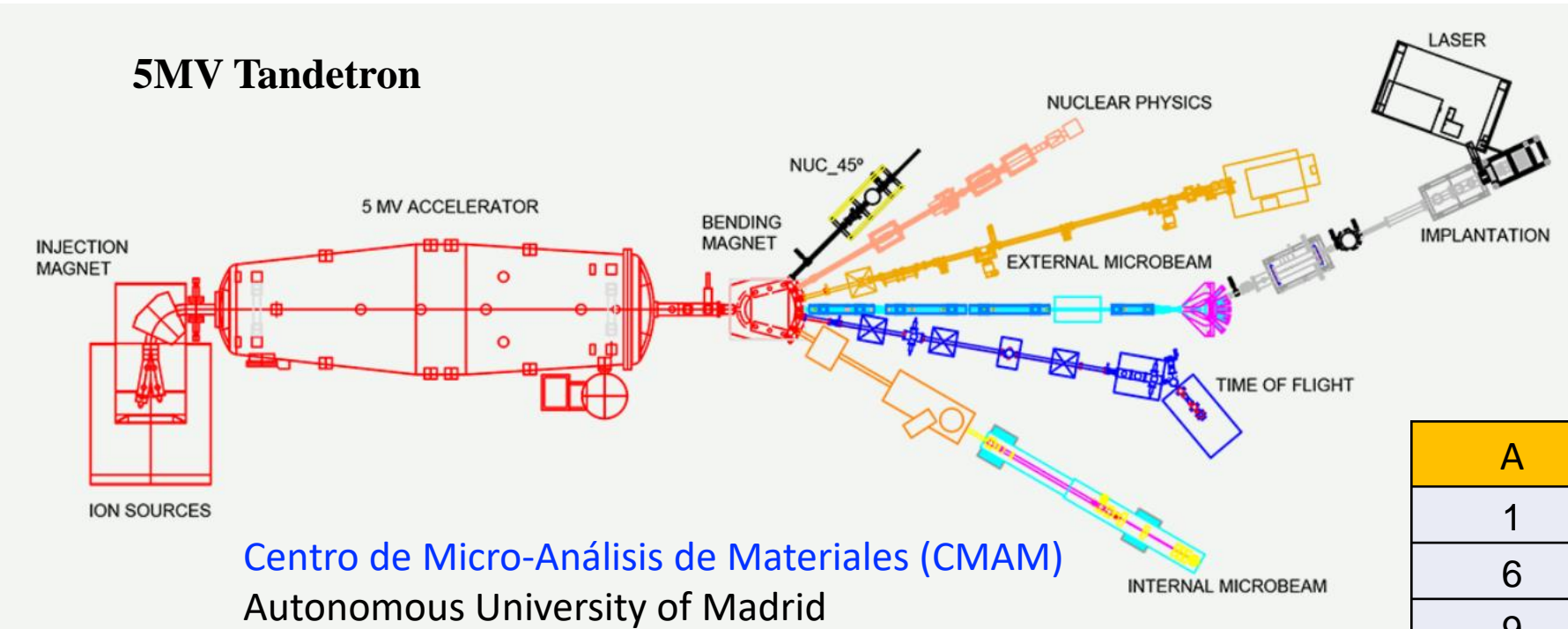
Beams on target:

- Wide spots: 1-1.5 cm
- Point-like spots: milimetric submilimetric



The beam size : important for the design

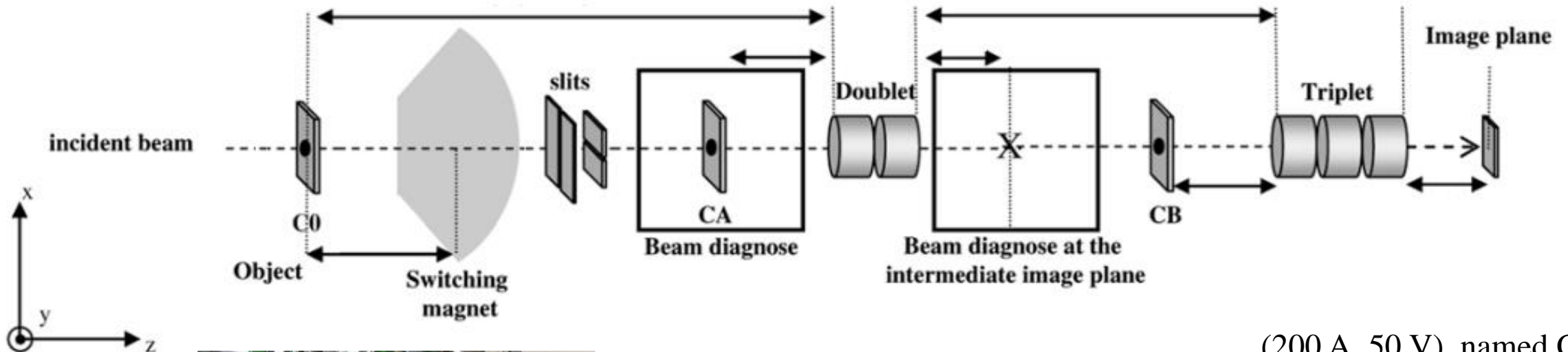
Madrid test-bench @ CMAM



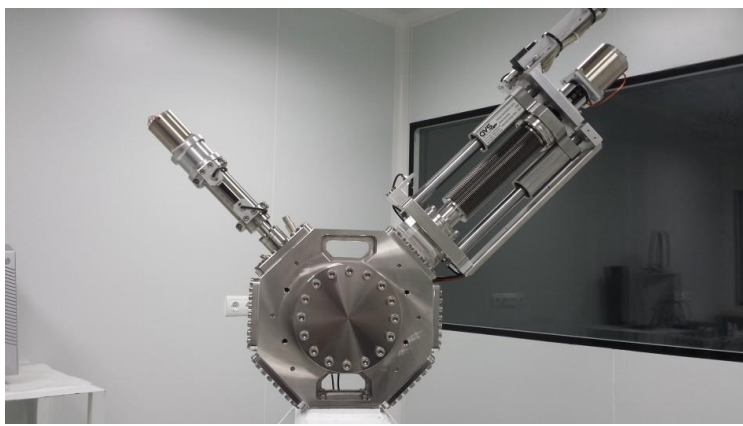
- ❖ Nuclear Physics beamline
- ❖ Buncher system being installed and commissioned 2024

A	Q	E (MeV)	E/A (MeV)
1	1	10.00	10.00
6	3	20.00	3.33
9	4	25.00	2.78
10	5	30.00	3.00
12	6	35.00	2.92

Focussing system with HIE-ISOLDE QUADS



HIE-ISOLDE Diagnostic boxes



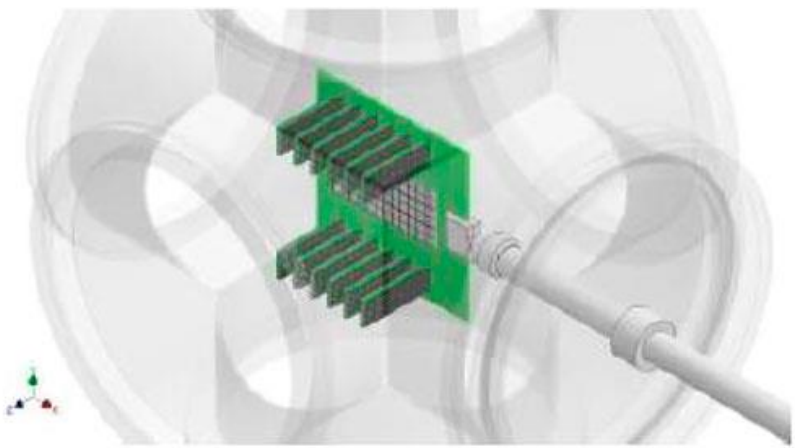
(200 A, 50 V), named Cobalt (CONverter Brick Adapted to control Loop Tuning),



Critical elements of the focal plane

- Particle telescope with different detection layers and a dedicated readout system.
- The frontend electronics must face a twofold challenge, the wide dynamic range and the time resolution for ToF
 - ✓ Silicon Carbide based detectors and fast scintillators.
 - ✓ Collaboration :
 - ✓ Chiara Guazzoni, Politecnico di Milano
 - ✓ Nara Singh Bondili, University of the West of Scotland

Ex. SiC developed for FRAISE INFN-LNS



Reaction chamber :

Targets :

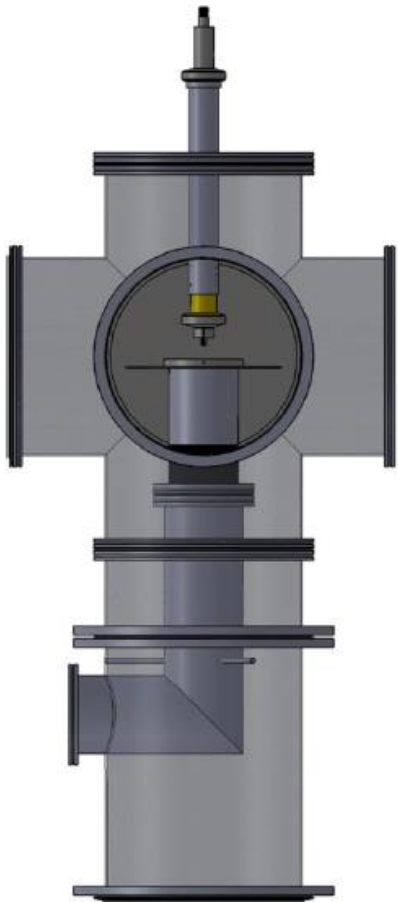
Particle detectors :

Standard solid target holder

Solid state : PIP's-Surface Barrier, PAD-DSSSD and SiC telescopes

Gas/cryo jet target. Ex. SUGAR

Scintillators



✓ Commissioning of the cryogenic jet target by using silicon detectors (in telescope array, single and DSSSD ones) and the available gases to produce a proof-target (Air and Nitrogen).

✓ Performing of the differential vacuum system and the jet vacuum system using turbo pumps, roots pumps and scroll pumps. Both systems should work in a vacuum regime from 1.5×10^{-1} (jet zone) to 4.5×10^{-6} mb (D.V.S. zone).

✓ Characterization of the cryo-jet achieving target thickness, energy resolution, isotopic discrimination, scattering rates and vacuum rates