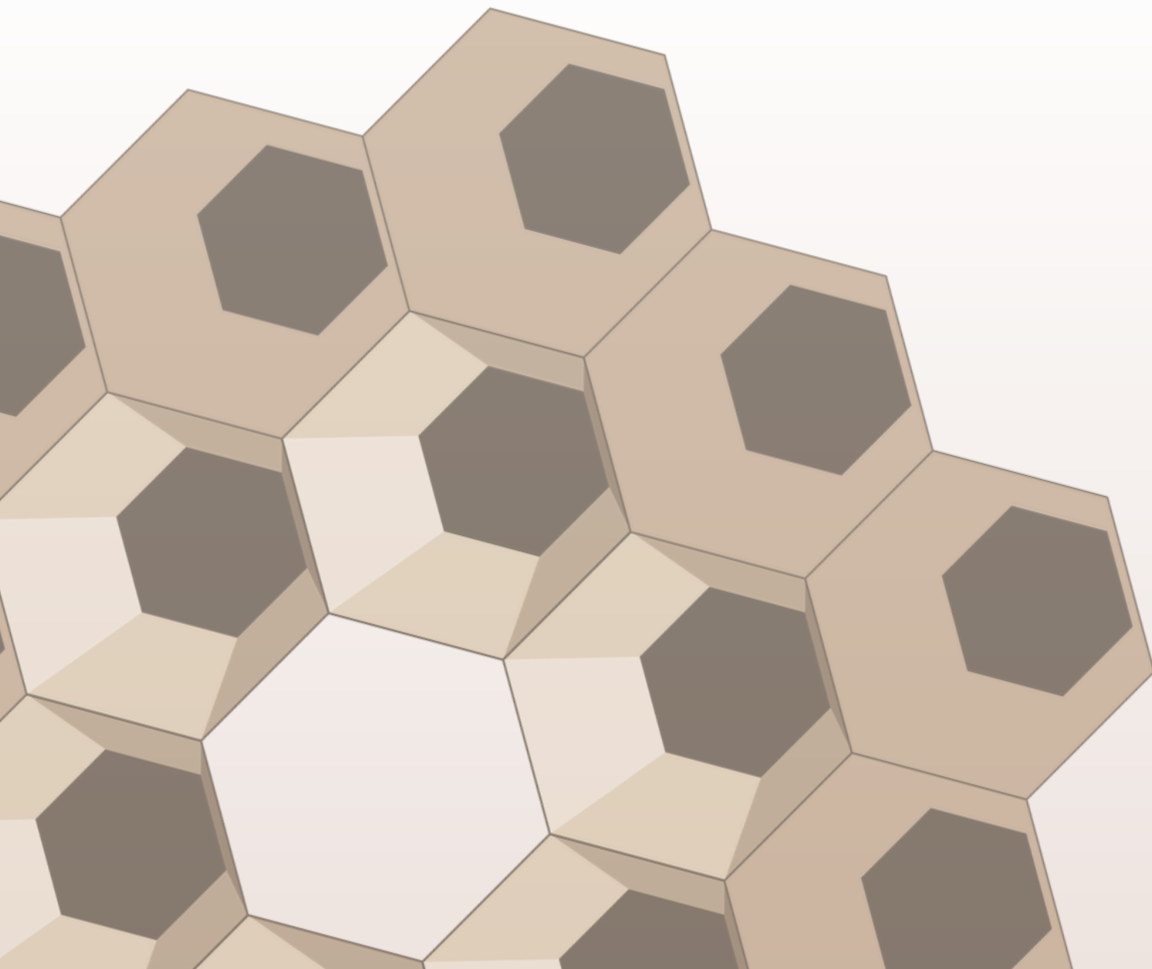
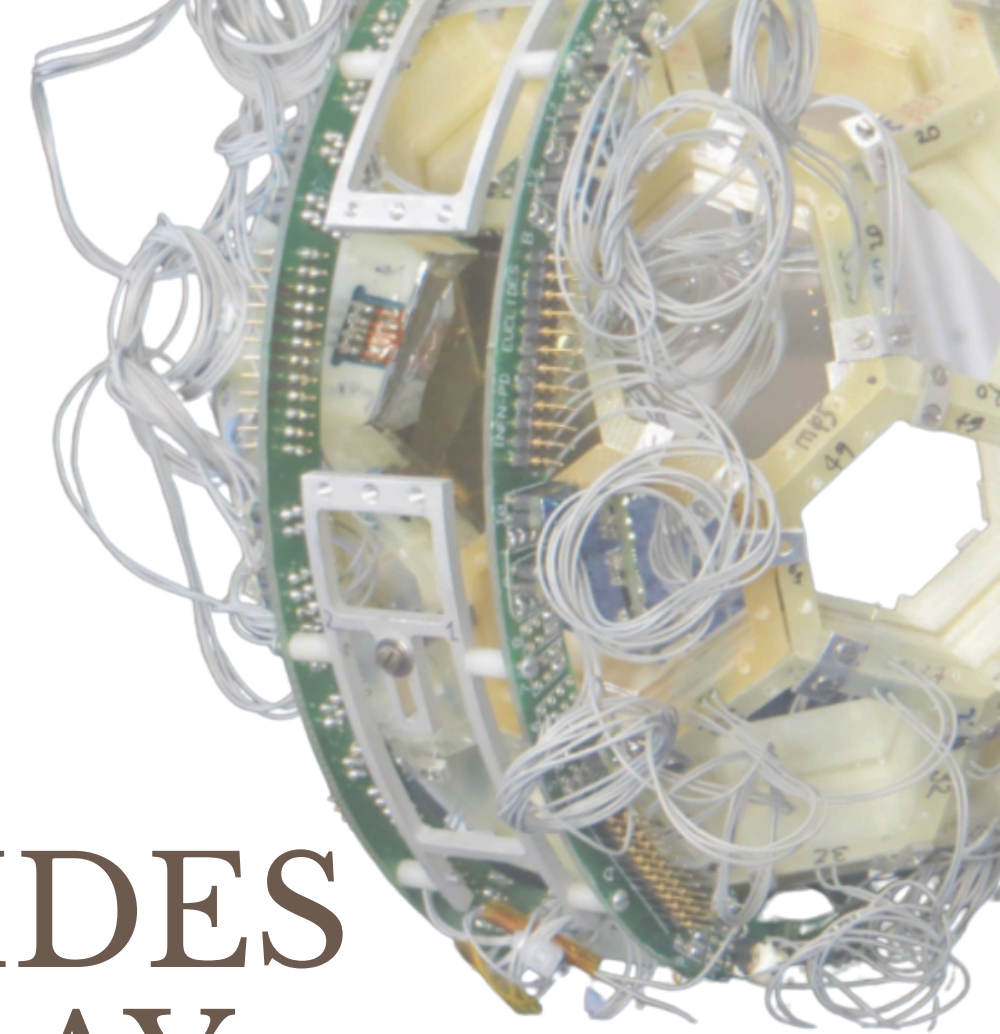


OVERVIEW OF THE EUCLIDES SILICON DETECTOR ARRAY

26TH AGATA WEEK AND ACC MEETING

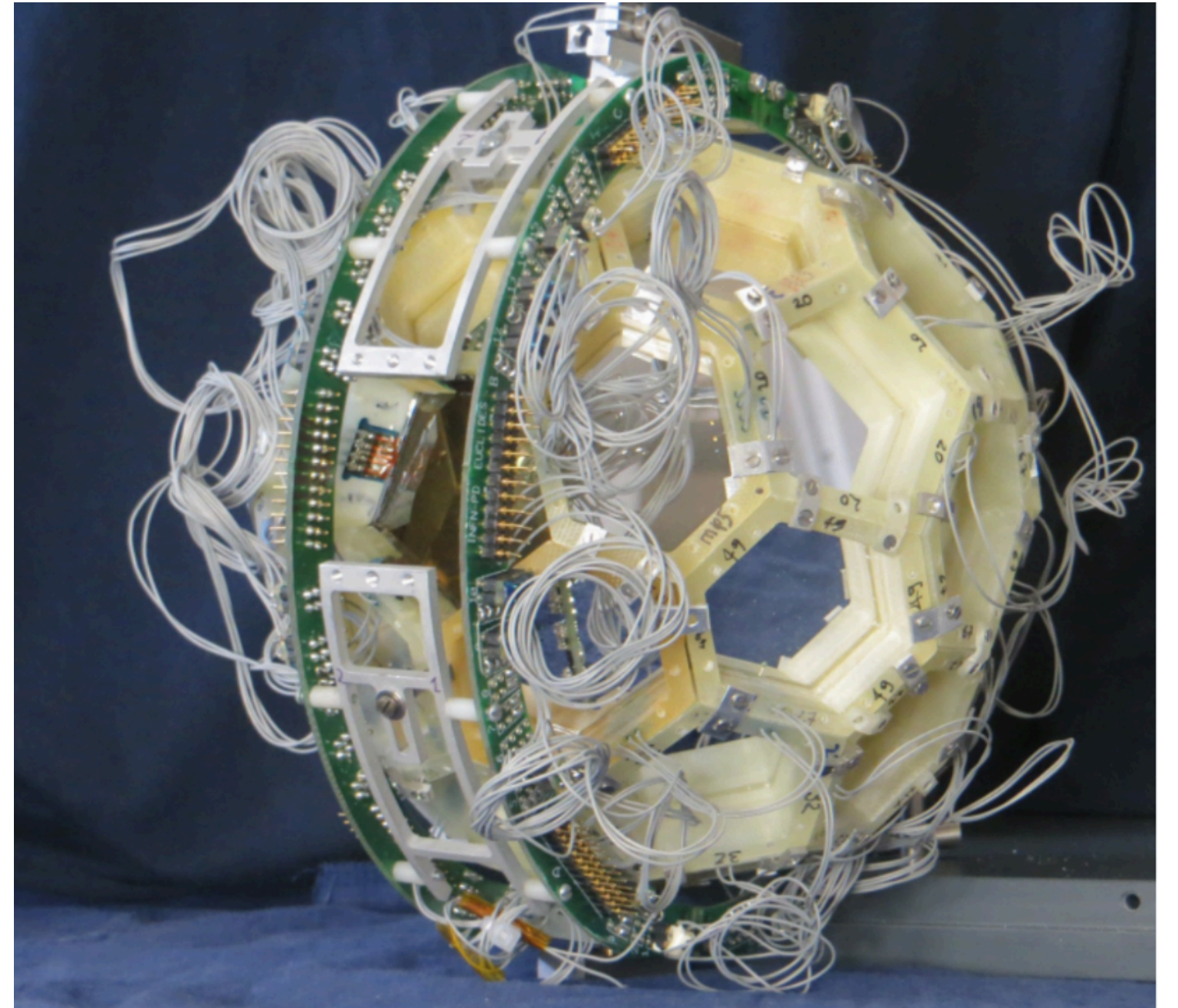
F. SIMIONI, D. MENGONI, D. BRUGNARA, F. ZENG

8th September 2026



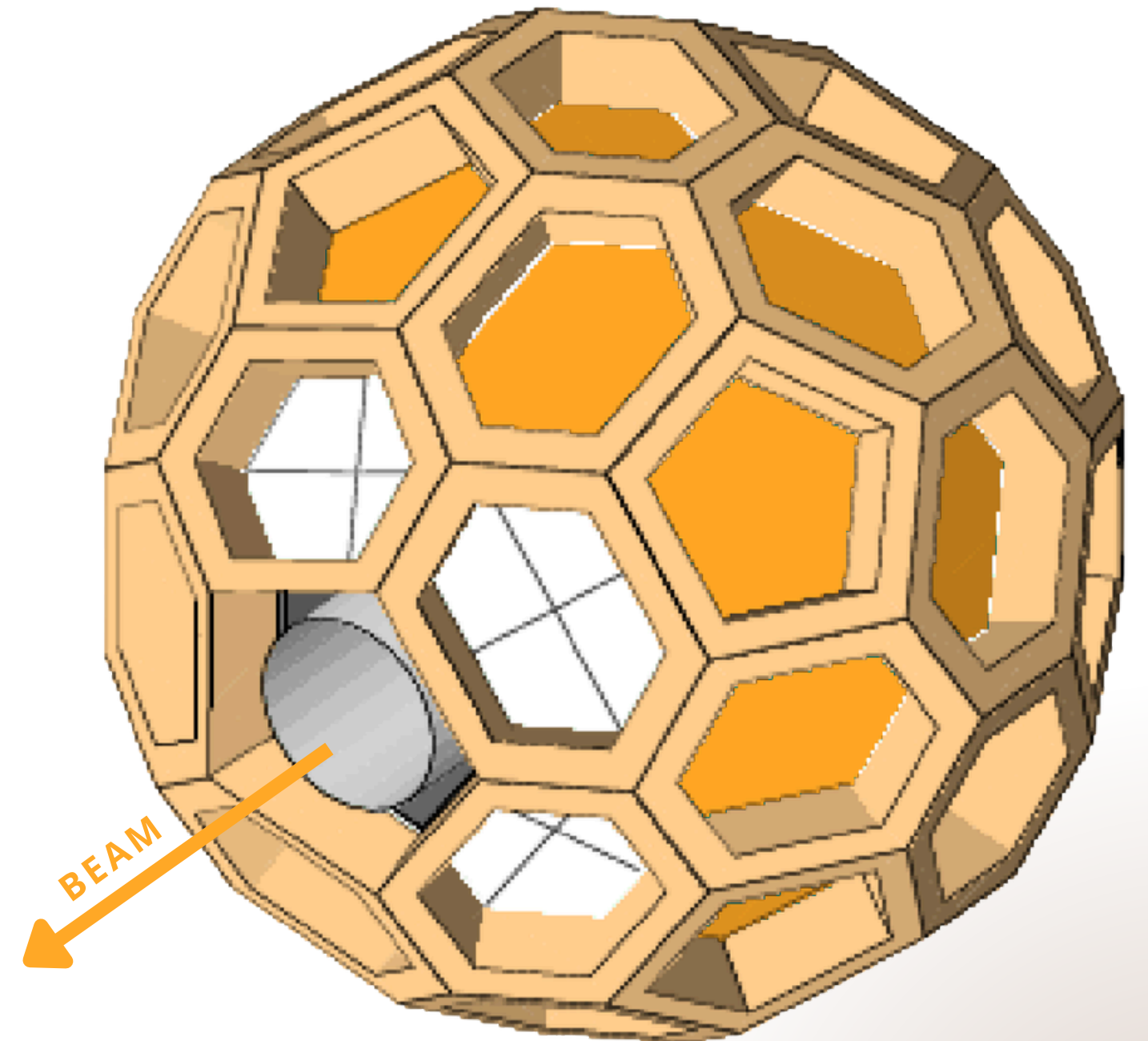
Euclides' overview

- Particle discrimination ΔE -E + PSA
- High gamma-ray transparency
- High efficiency thanks to $4\text{-}\pi$ design
- Event-by-Event Doppler correction
- Reaction channel filter (fusion evaporation reactions)



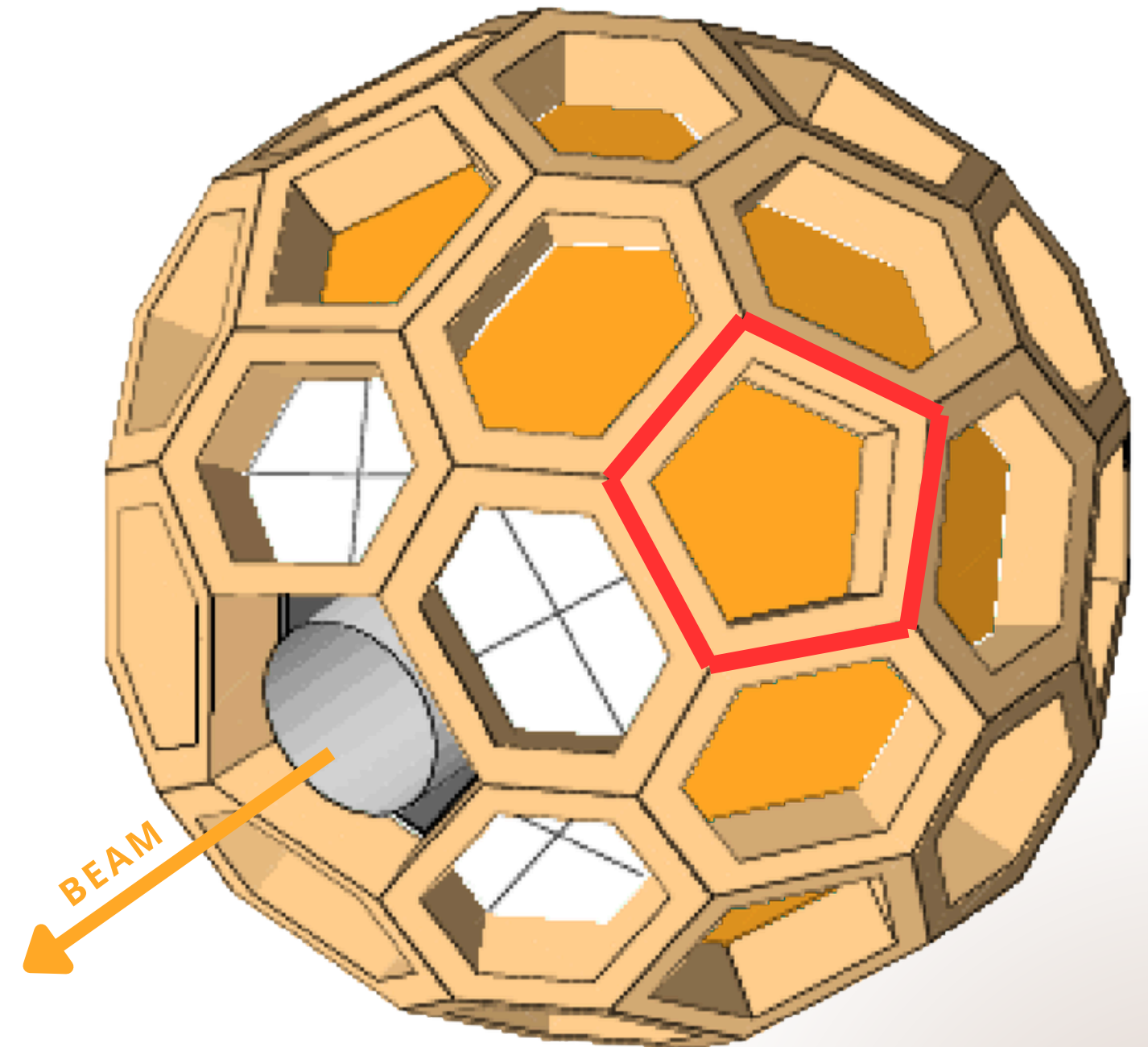
Geometry

- 80% solid-angle coverage
- Spherical shape
- Absorbers can/must be placed to protect the detectors from scattered beam



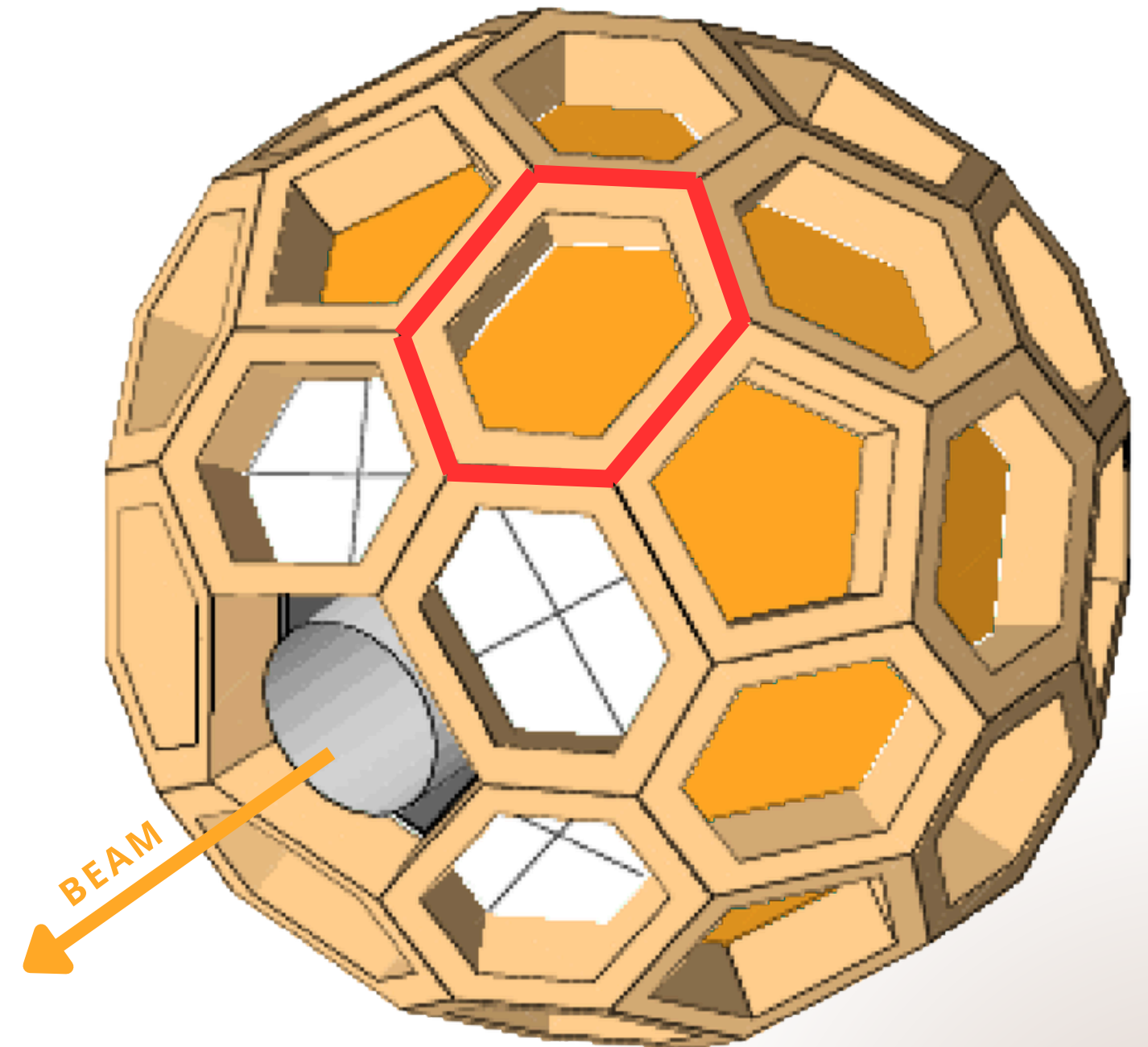
Geometry

- 80% solid-angle coverage
- Spherical shape
 - 15 pentagons (10 cm^2)
- Absorbers can/must be placed to protect the detectors from scattered beam



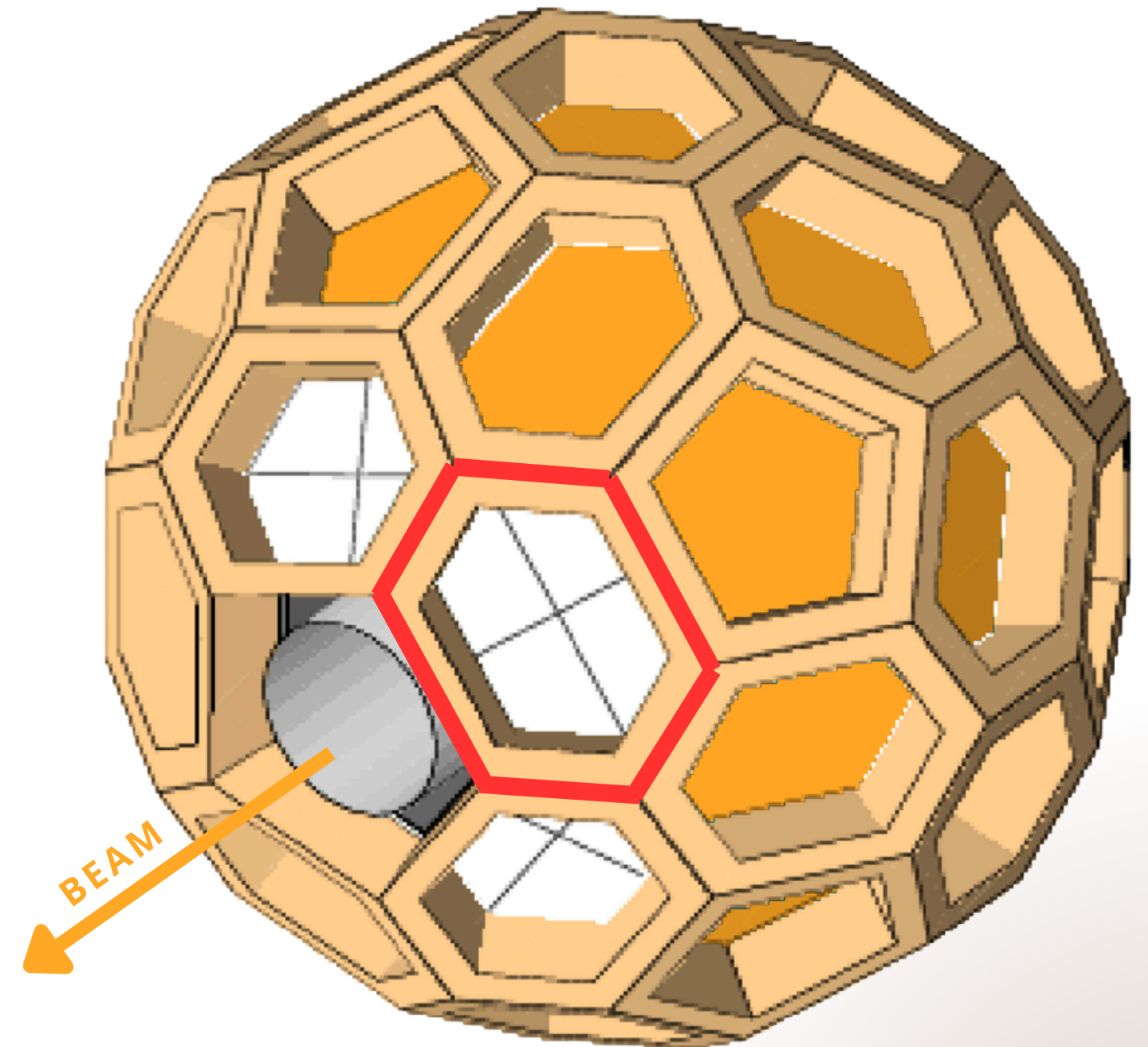
Geometry

- 80% solid-angle coverage
- Spherical shape
 - 15 pentagons (10 cm^2)
 - 20 hexagons (10 cm^2)
- Absorbers can/must be placed to protect the detectors from scattered beam

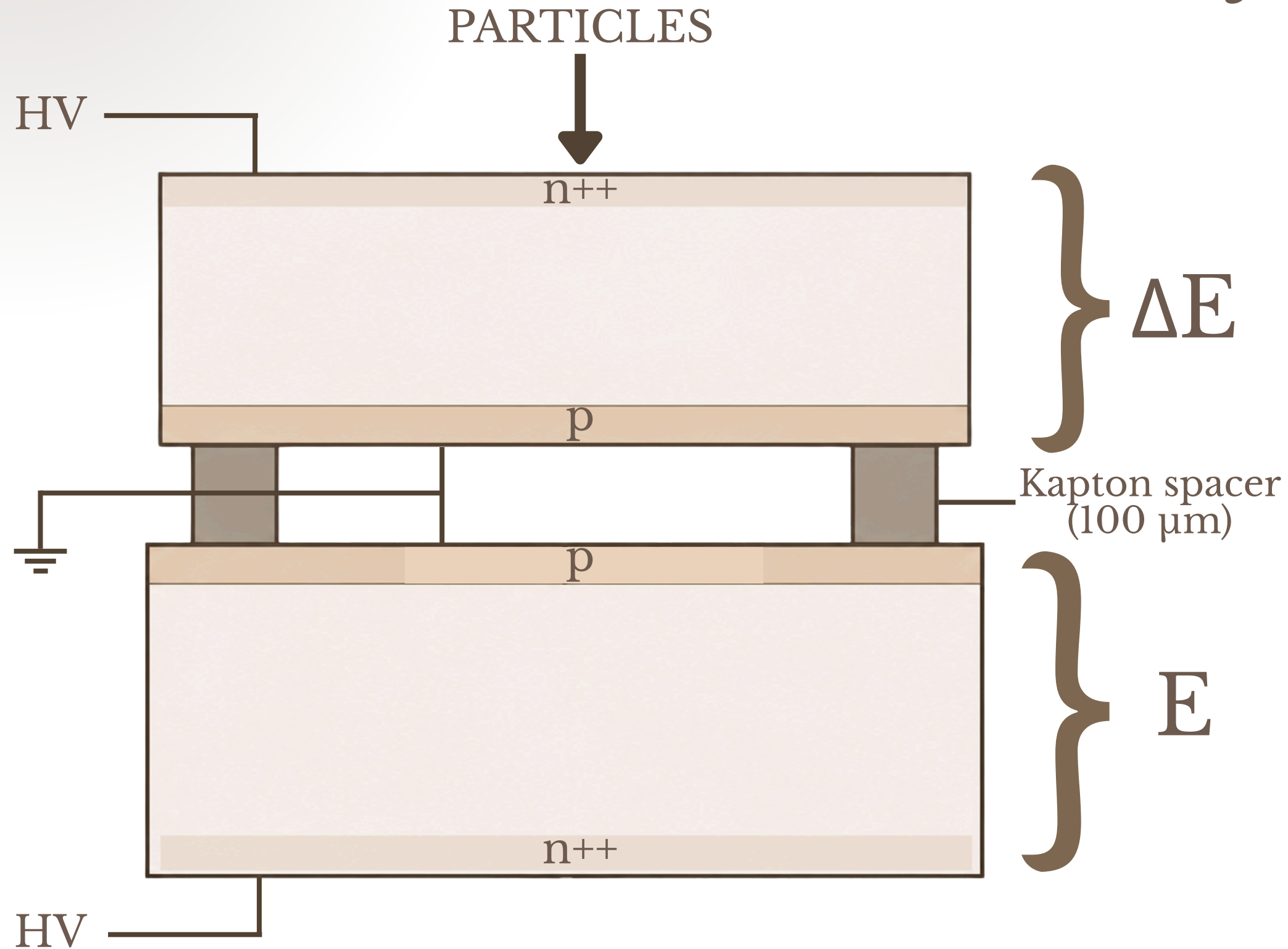


Geometry

- 80% solid-angle coverage
- Spherical shape
 - 15 pentagons (10 cm^2)
 - 20 hexagons (10 cm^2)
 - 5 4-channel segmented hexagons at forward angles (10 cm^2)
- Absorbers can/must be placed to protect the detectors from scattered beam



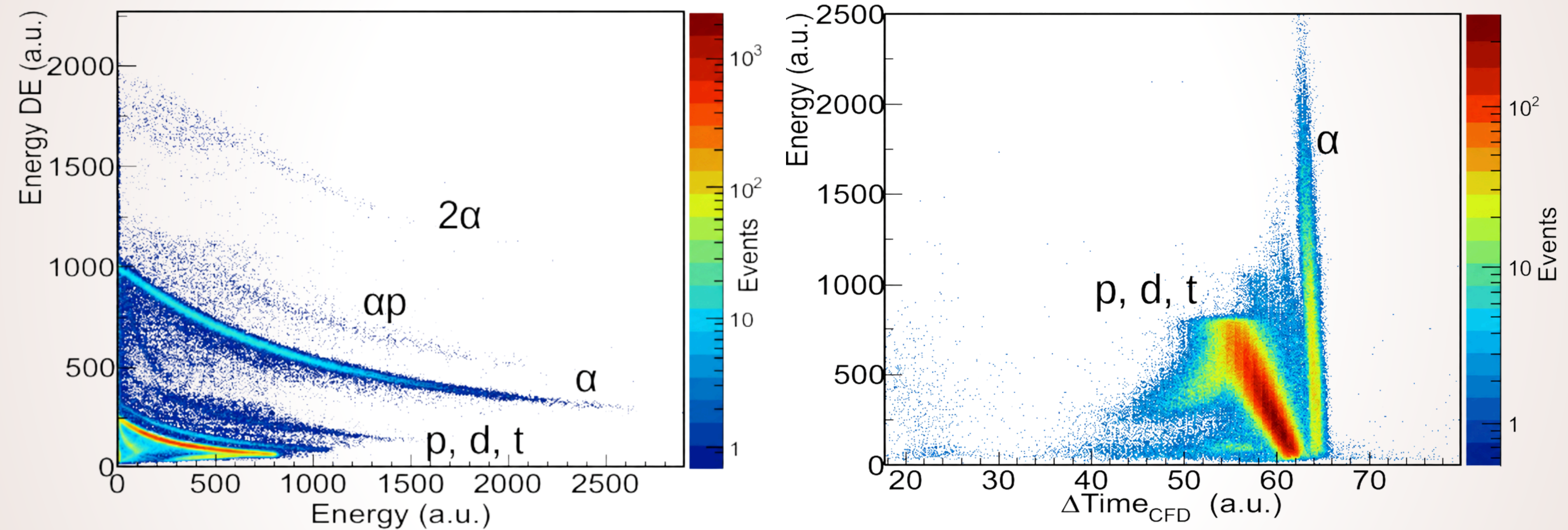
Layers' composition



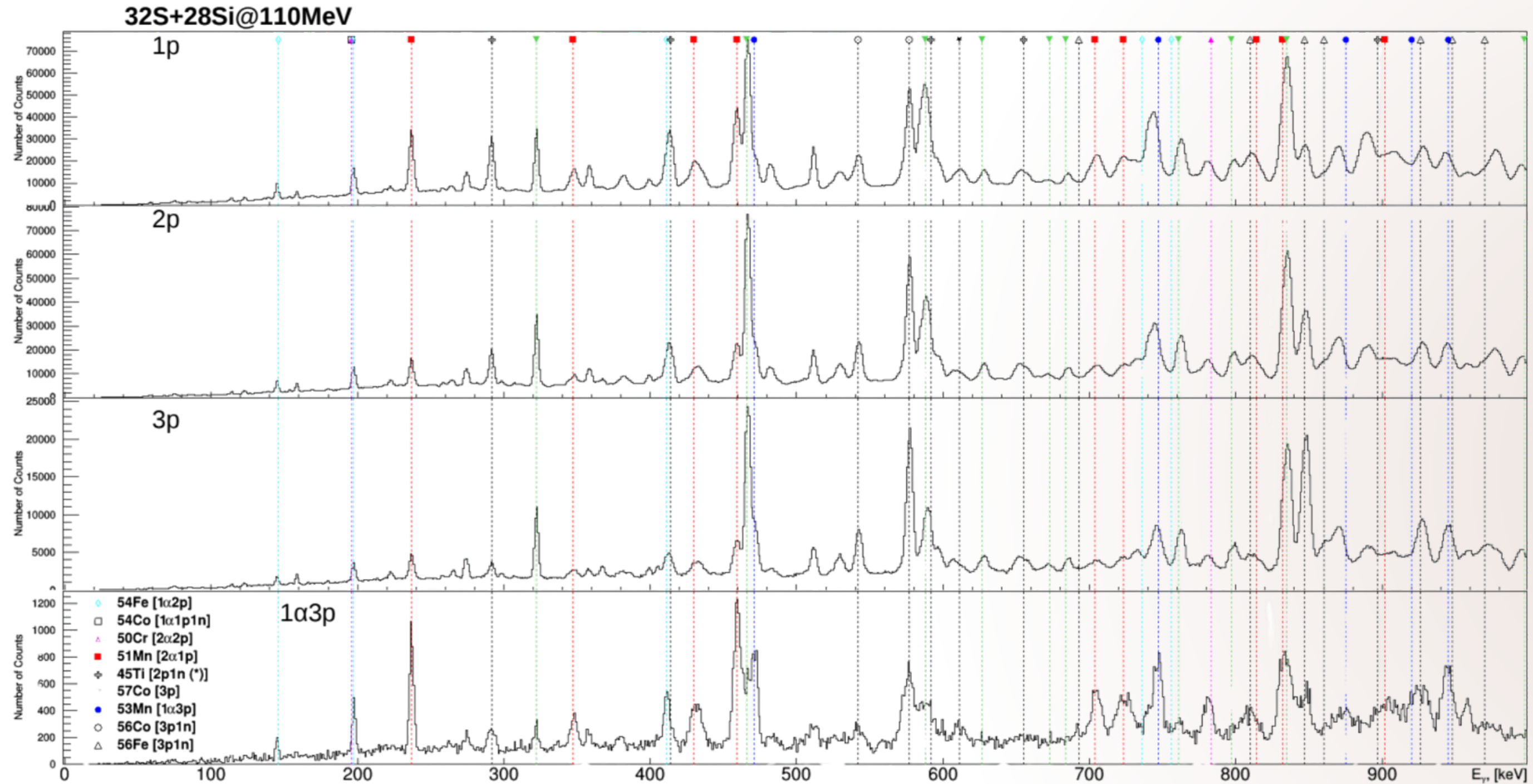
- Thickness: $\sim 130 \mu\text{m}$
- Bias: $\sim 40\text{-}50 \text{ V}$
- Leakage Current: $\sim 100 \text{ nA}$
- Lab resolution: $\sim 100 \text{ keV}$
- Capacitance: 850 pF

- Thickness: $1000 \mu\text{m}$
- Bias: $\sim 140\text{-}180 \text{ V}$
- Leakage Current: $\sim 500 \text{ nA}$
- Lab resolution: $\sim 50 \text{ keV}$
- Capacitance: 130 pF

Particle discrimination



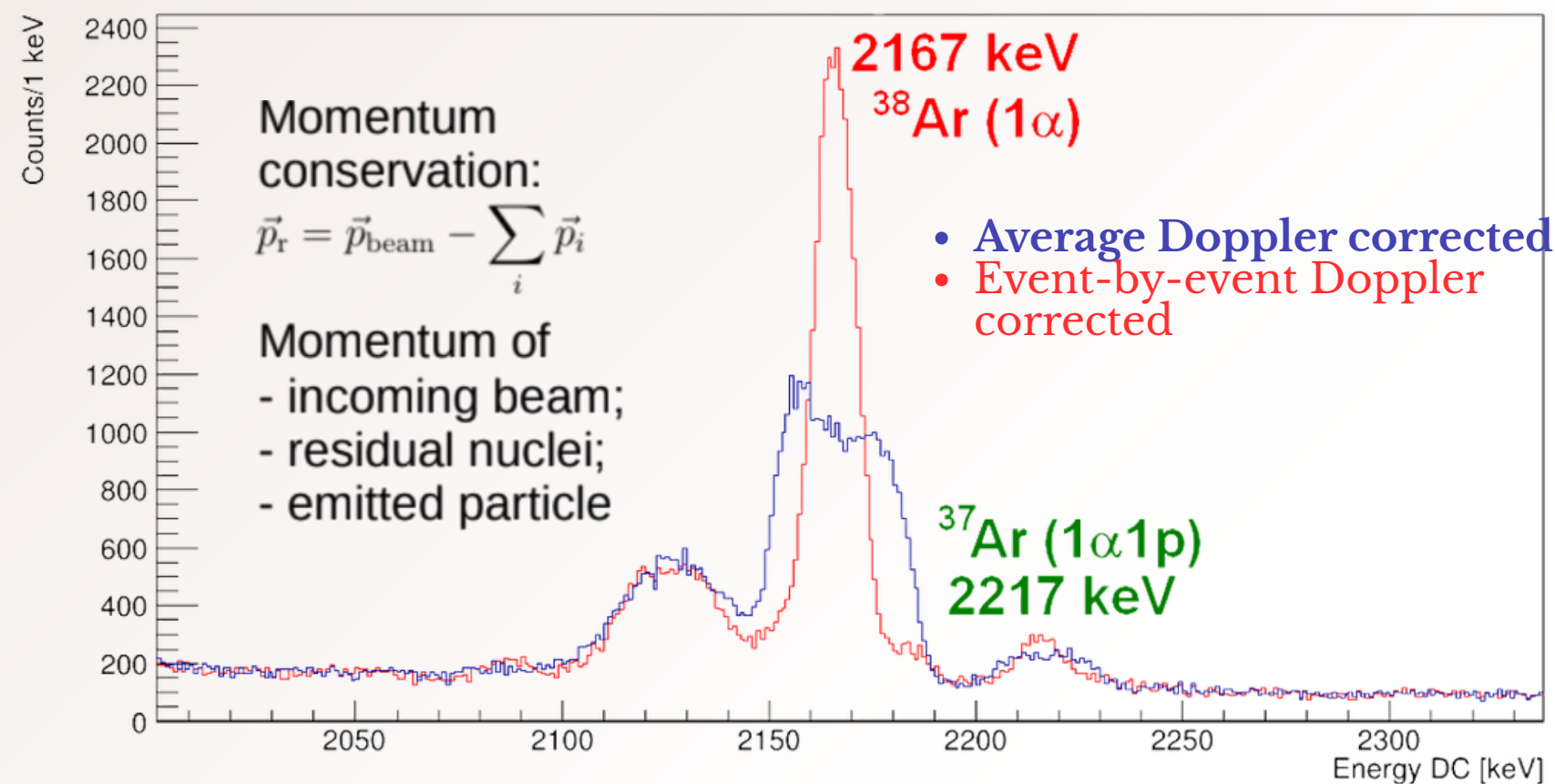
Reaction channel filter



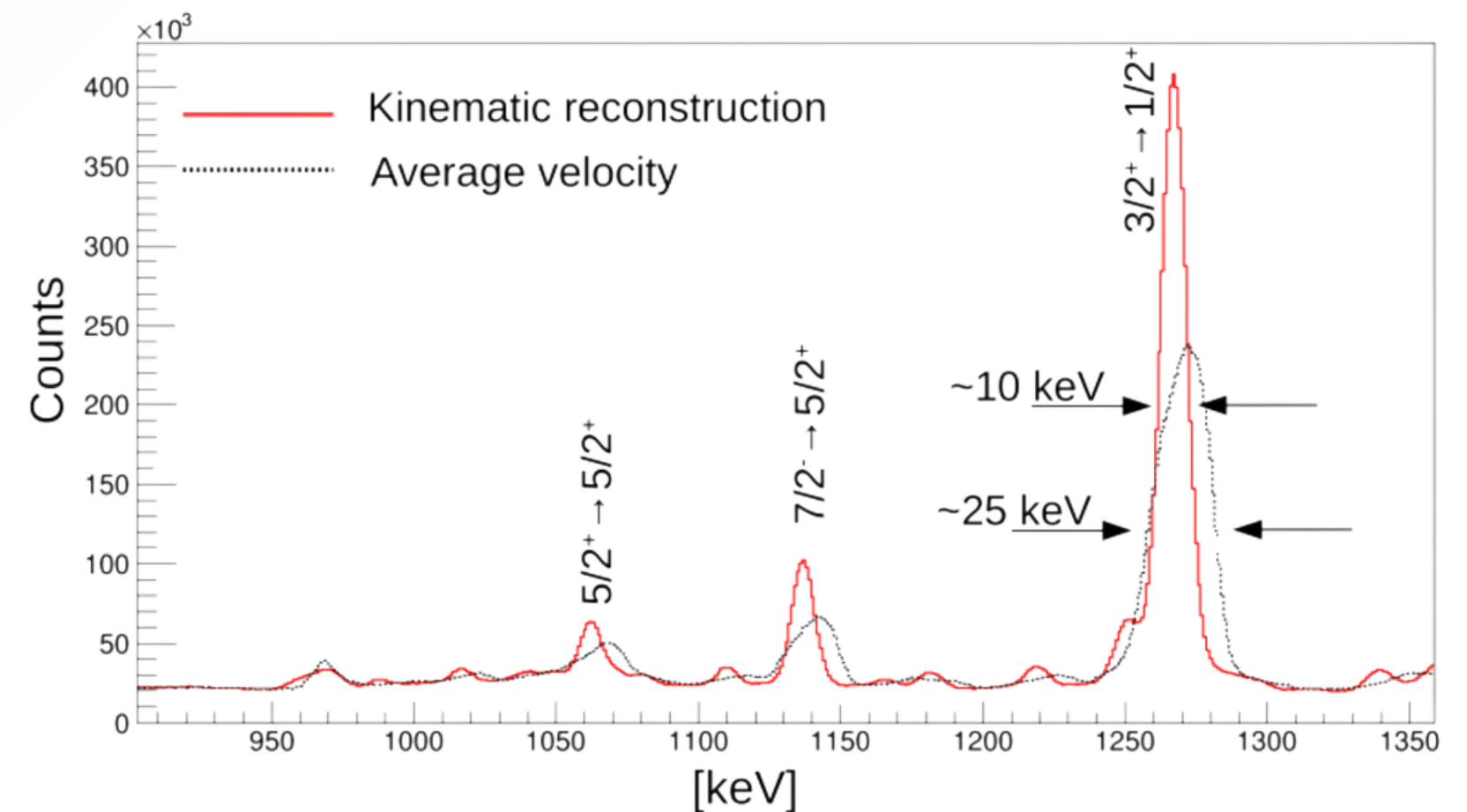
Significant suppression of background from other reaction channels

Doppler correction

- Event by event Doppler correction based on the kinematics
- Clear difference in FWHM



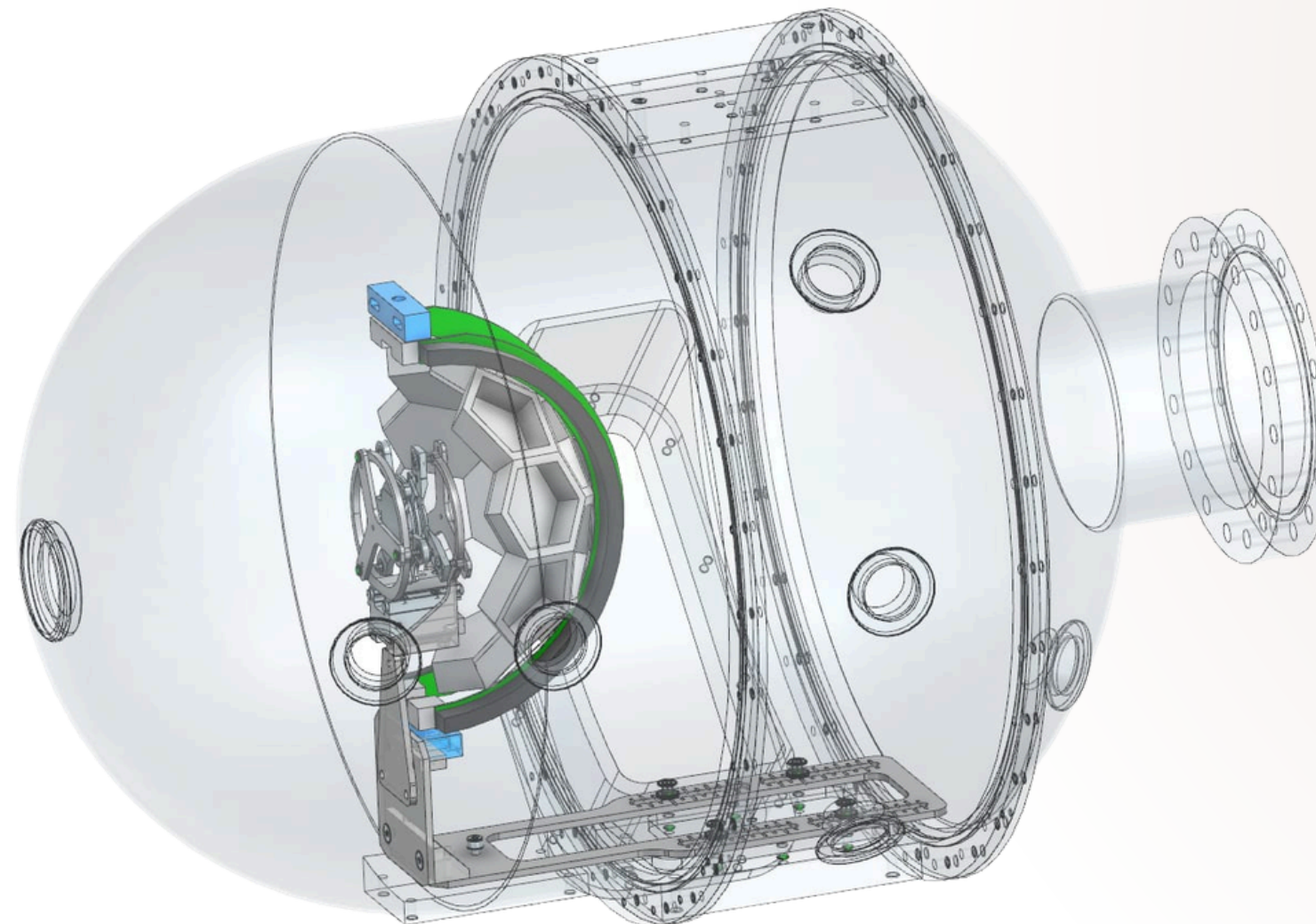
Partial γ -spectrum α -gate requested
 $^{12}\text{C} + ^{30}\text{Si} (47 \text{ MeV}) \rightarrow (^{42}\text{Ca})^*$
 (Courtesy of M. del Fabbro)



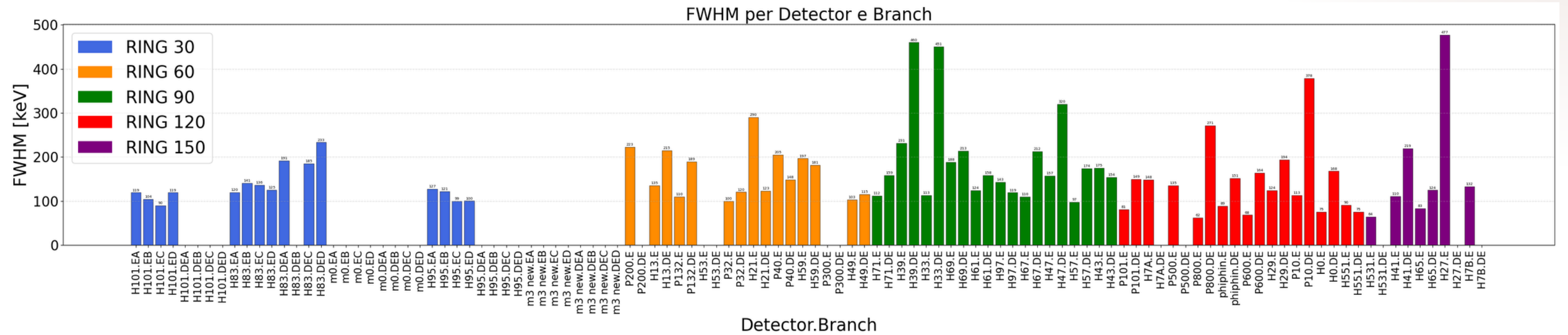
Partial γ -spectrum α -gate requested
 $^{12}\text{C} + ^{24}\text{Mg} (45 \text{ MeV}) \rightarrow (^{36}\text{Ar})^* \rightarrow ^{31}\text{P}$

Plunger configuration

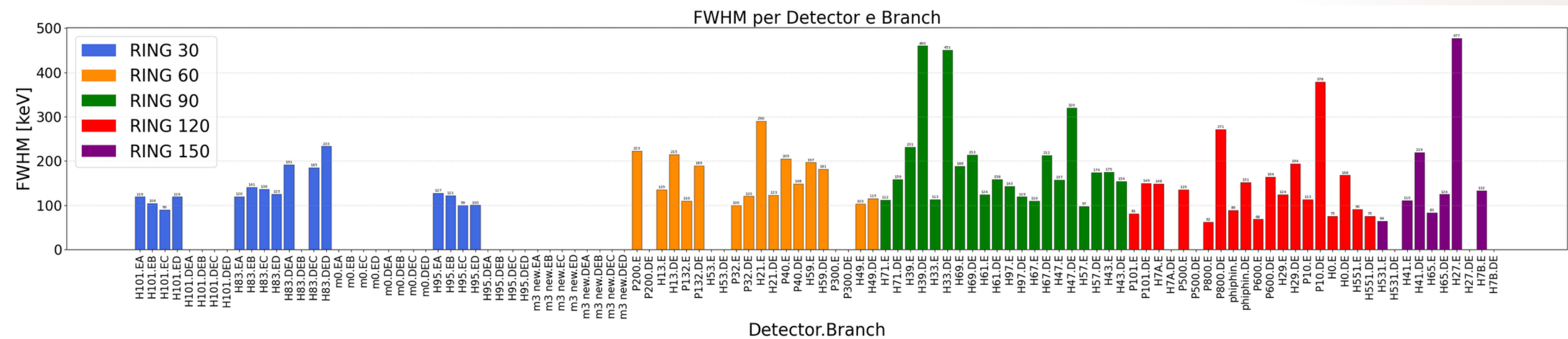
- Can be operated in combination with the plunger at the cost of removing the backward portion of the solid angle
- Distances between target and stopper foil from a few μm tens of mm with a sub- μm precision



Recent tests



Recent tests



OUTLOOK

01

PCB REDESIGN

Improvement and optimization of the detector readout PCB

02

KAPTON TOWARDS THE FLANGE

03

FLANGE DESIGN

Development and optimization of the flange configuration

THANK YOU FOR YOUR ATTENTION