The ISIS and EUCLIDES particle detectors at GASP: status and perspectives

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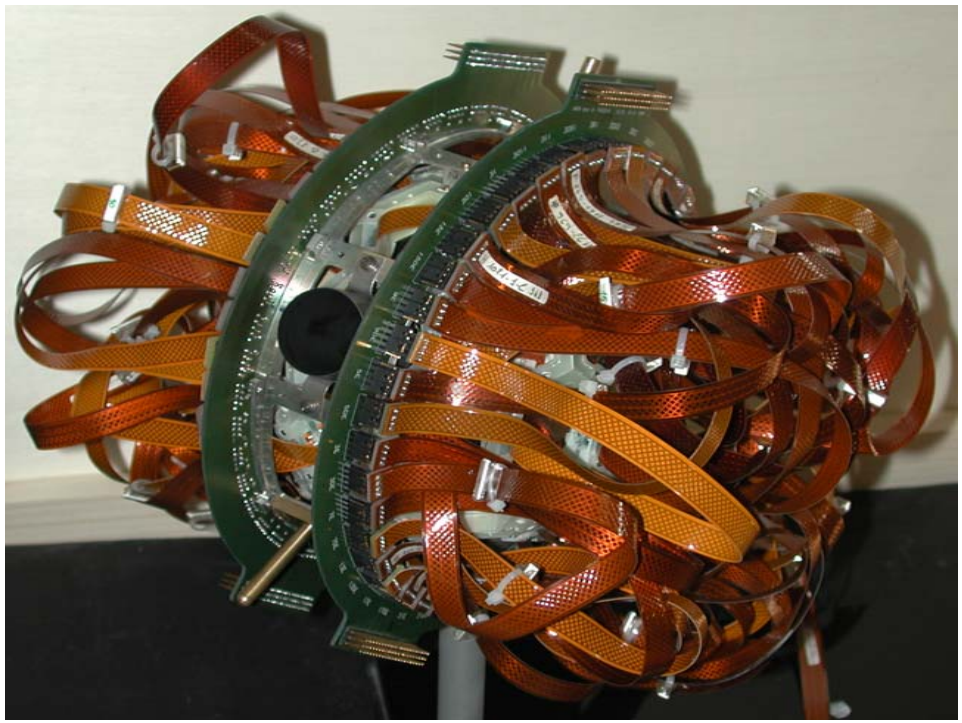
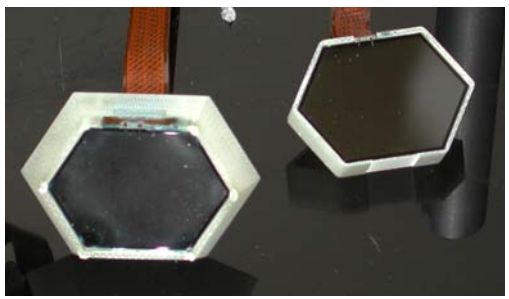
Overview

- ISIS at GASP
- EUCLIDES at EUROBALL IV
- EUCLIDES at GASP

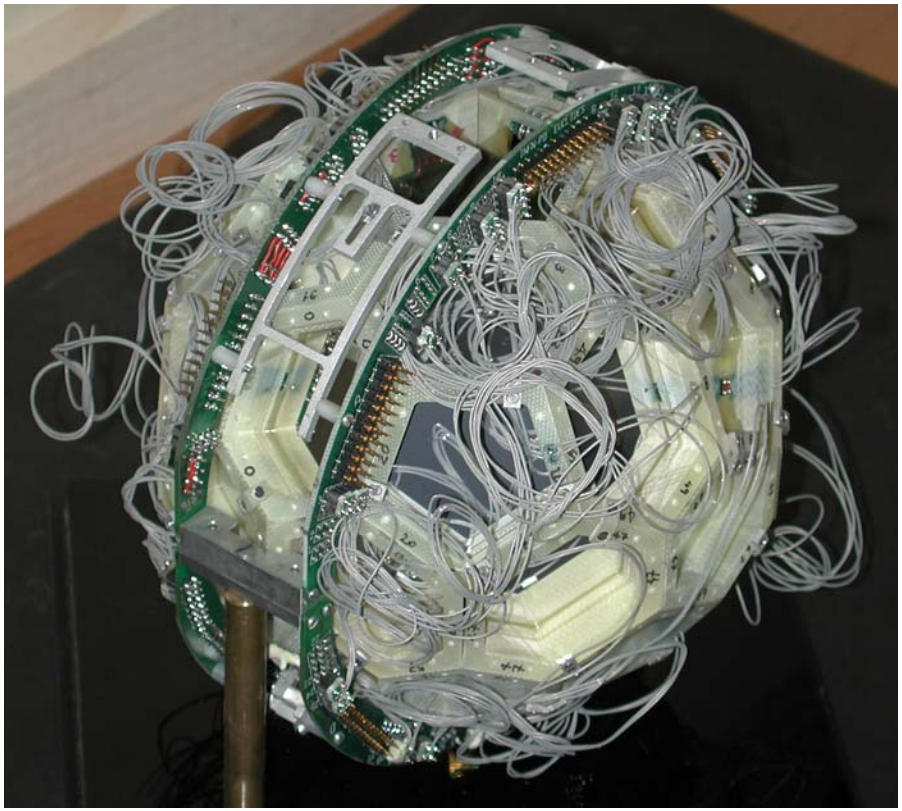
ISIS

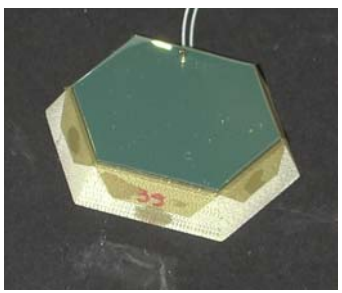




- 40 ΔE-E telescopes
  (130 μm + 1 mm)
- Geometrical coverage:
  71% ΔE, 65% telescopes
- Average efficiencies:
  $\varepsilon_p \approx 50\%$, $\varepsilon_\alpha \approx 30\%$
  (strongly dependent on the absorbers and the target)
- Good transparency to γ-rays
- Problems because of the ageing detectors (sparks, high reverse current)

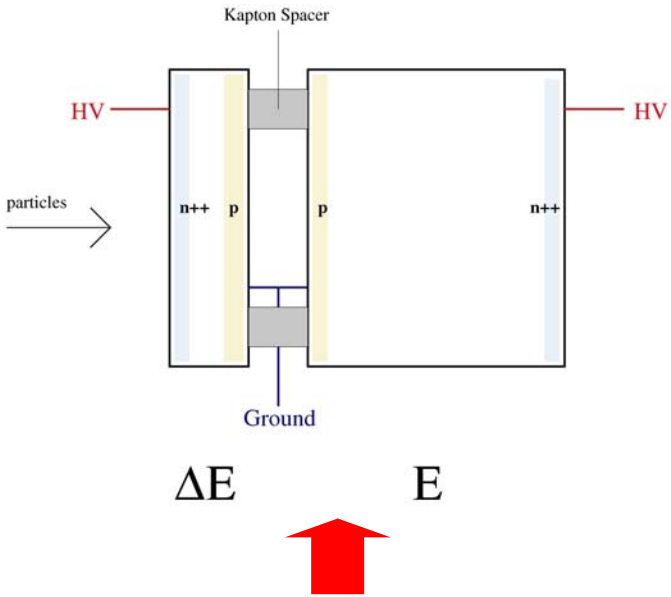
EUCLIDES





- 40 ΔE-E telescopes
  (130 μm + 1 mm)
- Geometrical coverage:
  81% ΔE, 80% telescopes
- Average efficiencies:
  $\varepsilon_p \approx 50\%$, $\varepsilon_\alpha \approx 30\%$
  (strongly dependent on the absorbers and the target)
- Good transparency to γ-rays

ISIS→EUCLIDES



- 100 μm E-ΔE distance
- Common ground
- Reversed ΔE
- Pulse shape?
- Covered with Upilex

- New mechanical design

→ More compact array

- Segmented forward detectors

→ Higher beam current allowed

- New dedicated CAMAC electronics

  (Silicon Shaper Analyzer)

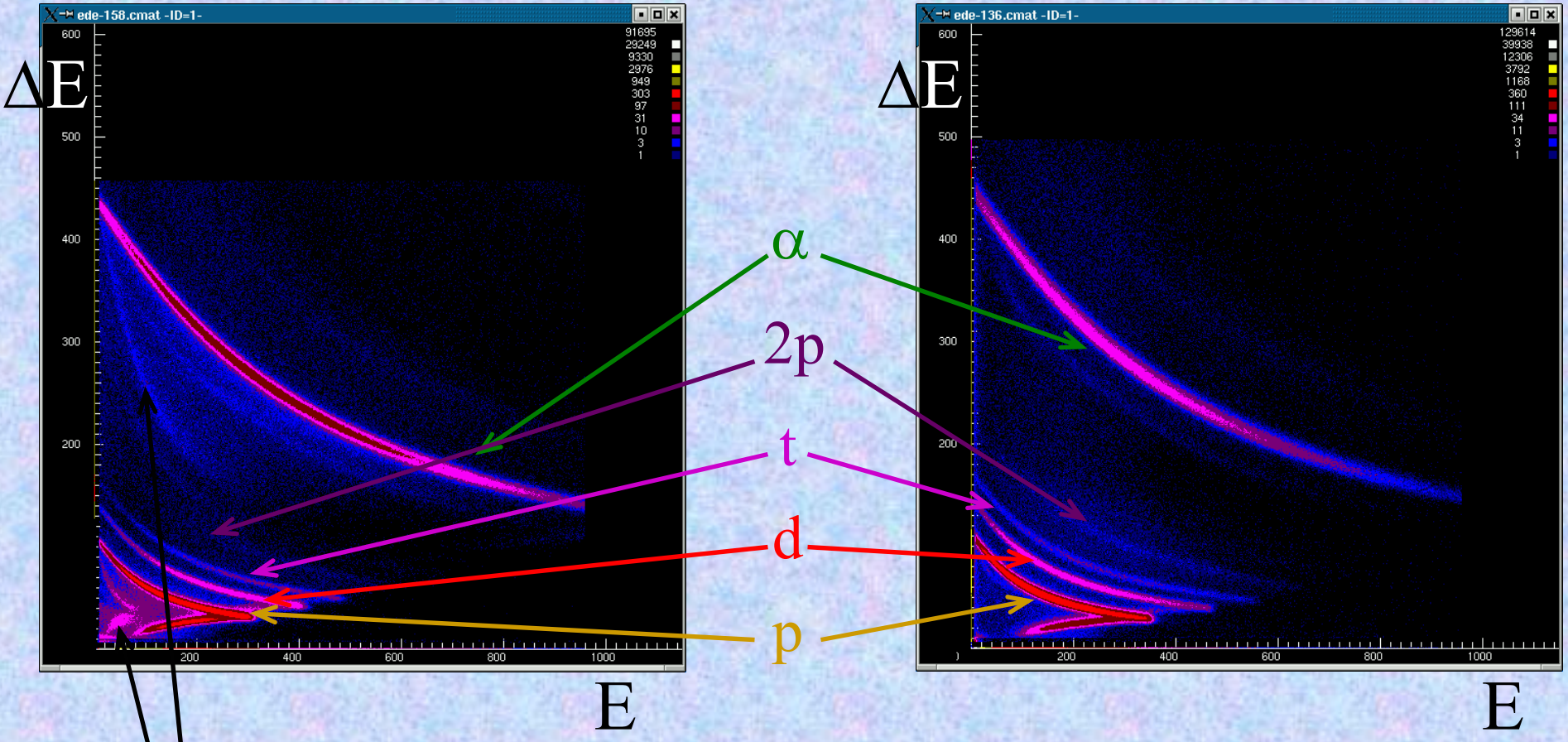
EUCLIDES Experiments at IReS

Alone	1 exp.	5 days
Plunger	3 exp.	16 days
N-Wall	11 exp.	69 days
N-Wall + Isomer tagging	2 exp.	16 days
Inner Ball	5 exp.	23 days
Hector + Inner Ball	1 exp.	6 days
RFD	1 exp.	6 days
	24 exp.	**141 days**

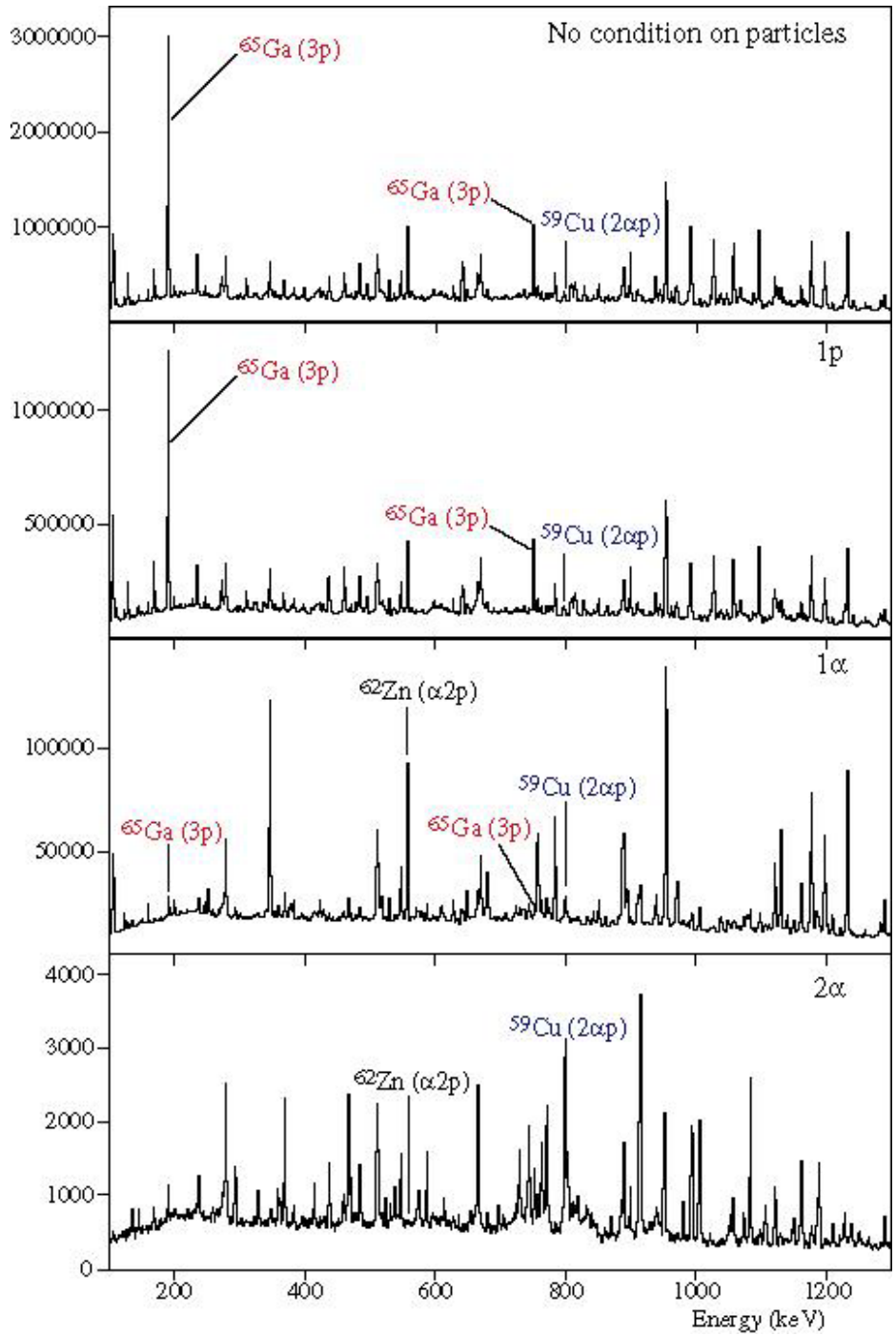
Particle discrimination

Segmented

Non segmented



Incomplete charge collection



Selection with conditions on particles

^{28}Si (100 MeV) + ^{40}Ca

EUCLIDES at GASP

- Segmentation of the forward telescopes

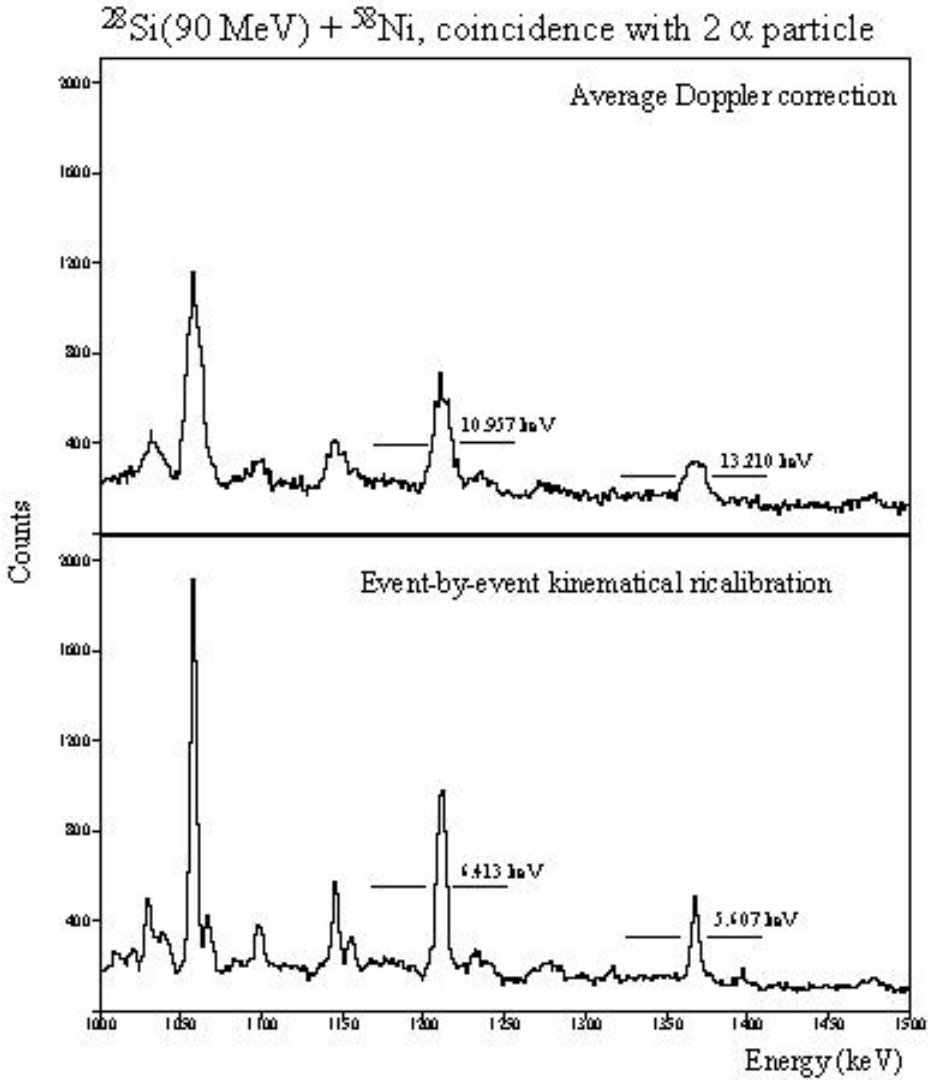
→ Less limitations on the beam current

- Compact design

→ Possibility to use with GASP Configuration II providing:

1. Channel selection
2. Doppler correction via kinematical reconstruction

Kinematical recalibration



GASP + ISIS

^{28}Si (90 MeV) + ^{58}Ni

Coincidence with 2α

N. Mărginean et al.

Possible scenarios

- Use only 80+80 DAQ channels (energy+timing)

→ Basically only needs a new reaction chamber

- Full EUCLIDES configuration

→ Needs a new DAQ system!

Main problem: manpower (in both scenarios)

Summary

- ISIS still provides reasonable performance despite the ageing detectors, but can be used only in Configuration I
- EUCLIDES could be used with GASP in Configuration II, with “EUROBALL-like” performance