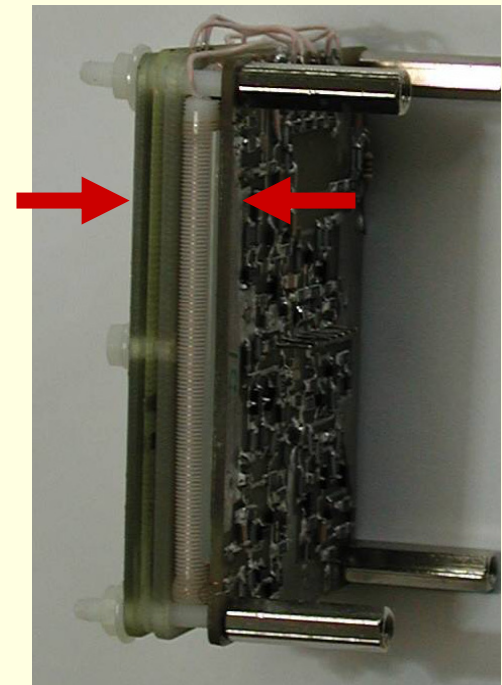# DANTE Ancillary Detector for AGATA

1. The DANTE detector

2. Performances with CLARA-PRISMA

3. First results with AGATA

The DANTE detector

Mylar

MCP

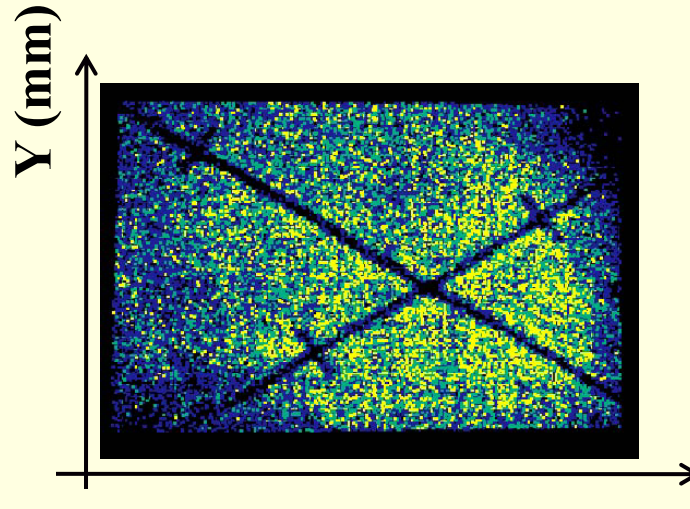Delay line

Preamplifier in vacuum

Thickness:13mm

Lateral section

DANTE performances

DANTE PROVIDES

Impact position of ions (X, Y)

$\sigma_x = 1$ mm

Time of impact of ions

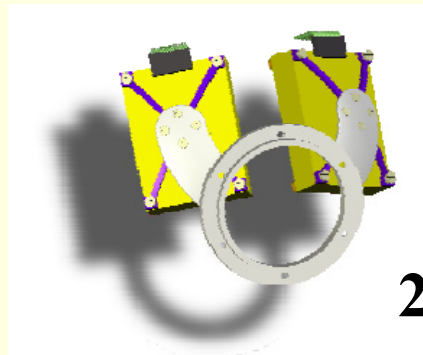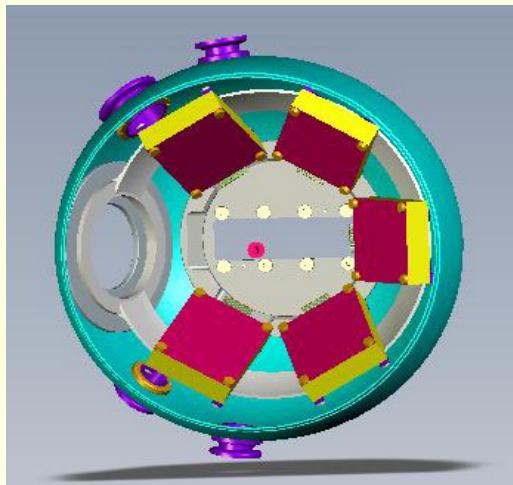$\sigma_t = 130$ ps

Y (mm)

X (mm)

DANTE does NOT provide ion velocity
-> velocity estimated from a two-body kinematic model

Doppler correction is performed on AGATA using DANTE position and an average velocity

train moving to right

longer wavelength;
sound lower pitched
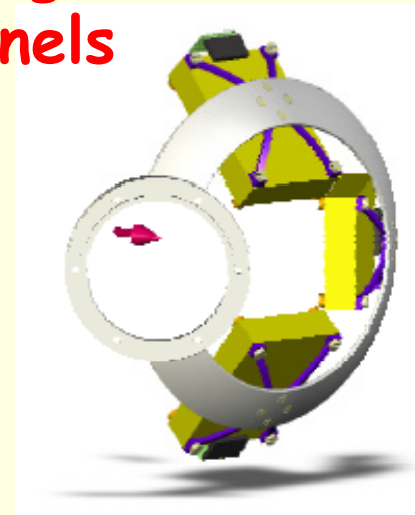
shorter wavelength;
sound higher pitched
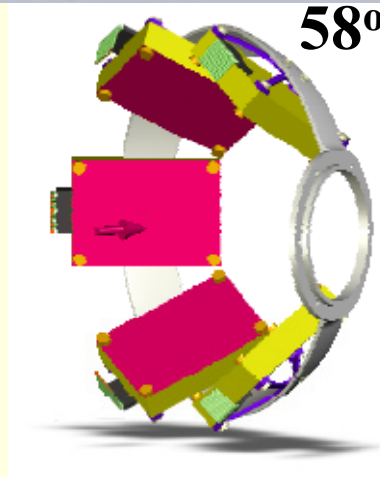
DANTE configurations

Use of different configurations depending on the grazing angle of the reaction: wide angular range covered with just few electronics channels
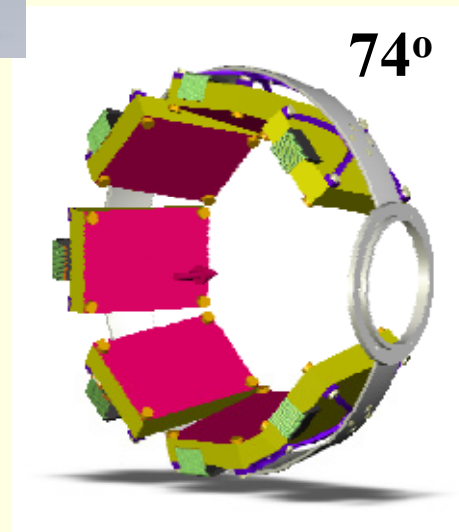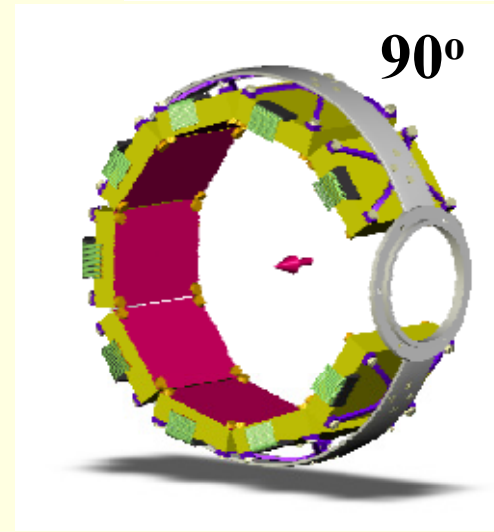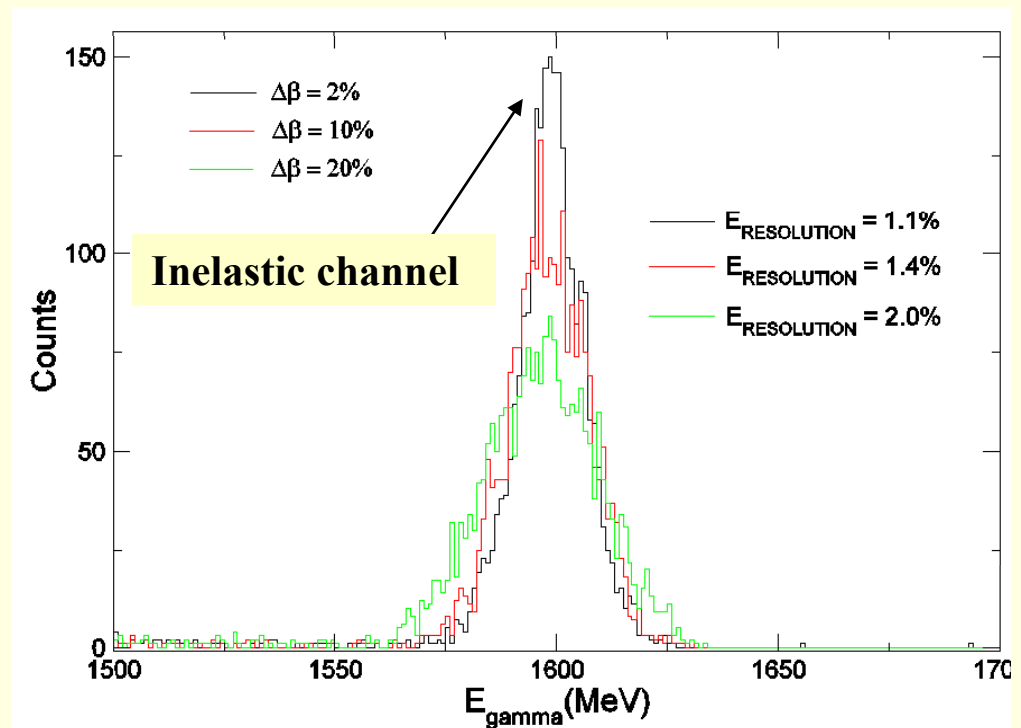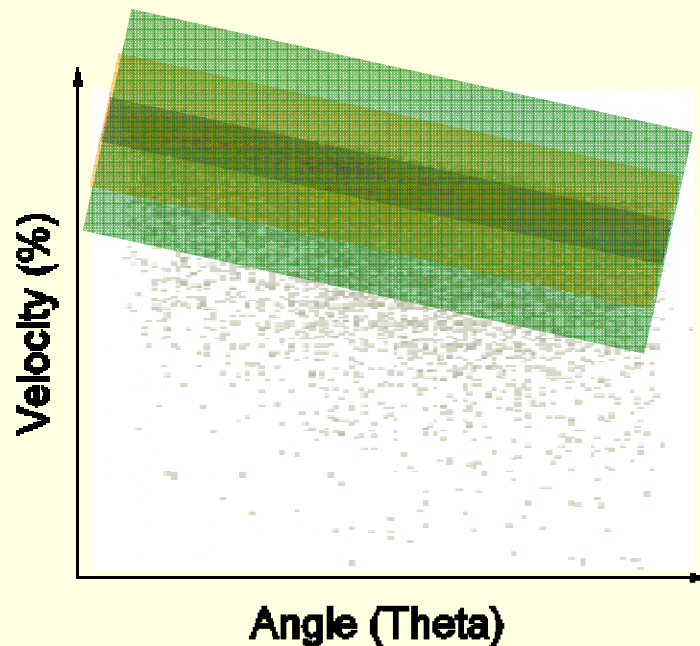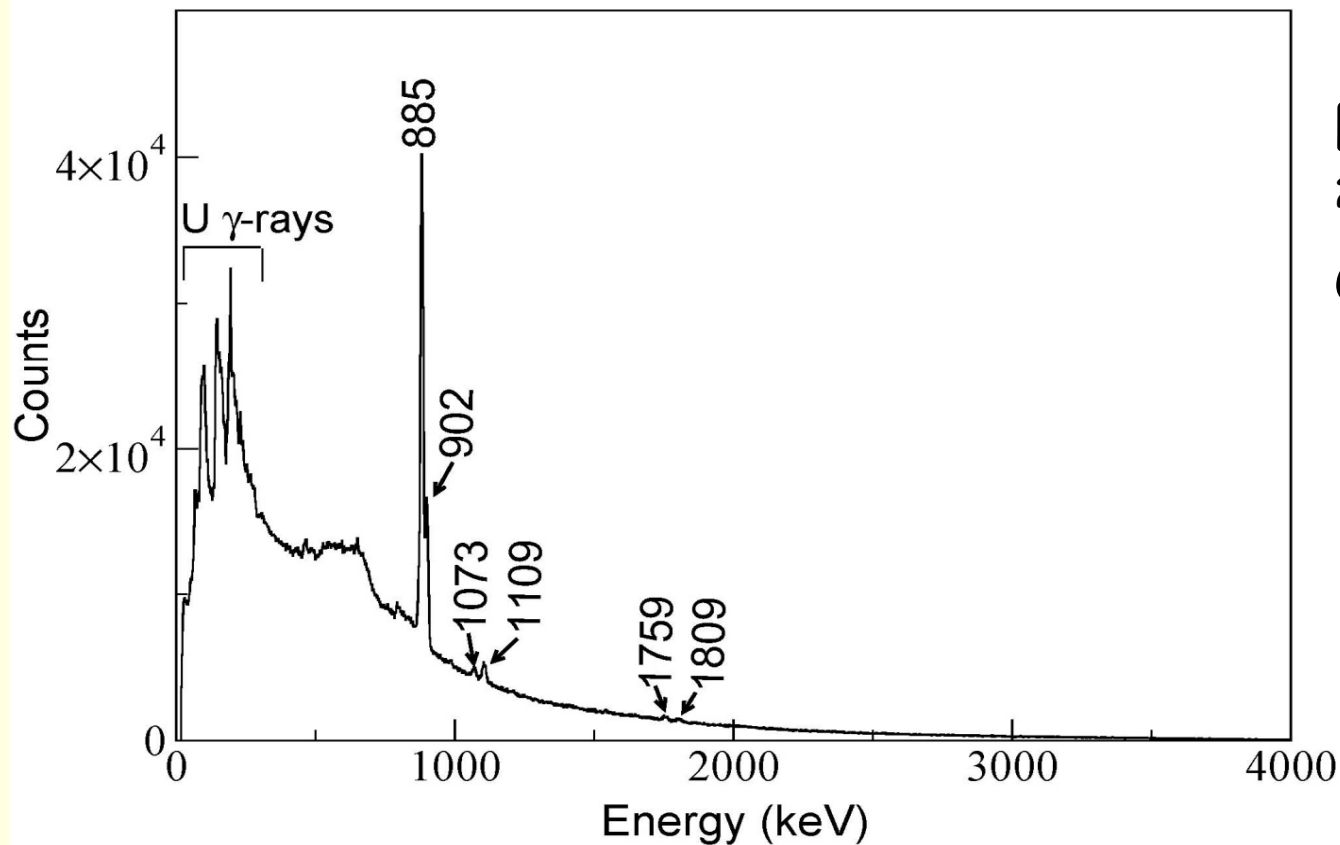

26°

42°

58°

74°

90°

DANTE simulations with CLARA

- Simulations made with GEANT4 using Enrico's code

- Velocity distribution of the recoils, DANTE does not measure the velocity.

  - An average velocity which presents Δβ = 20% gives an $E_{RESOLUTION}$=2.0%

Performances with fission (1)

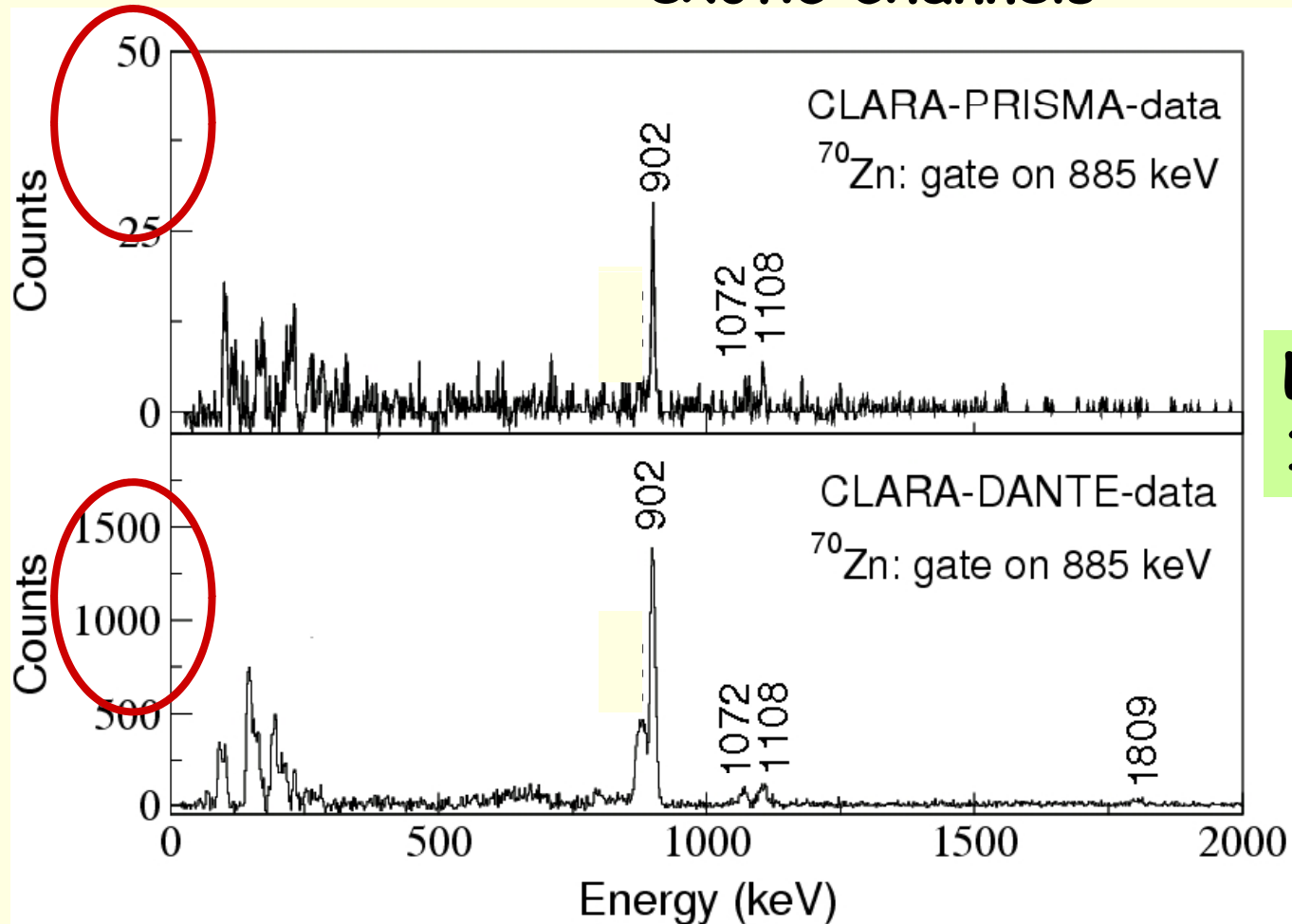The use of Uranium target implies a large fission fragments yield, no kinematic coincidence: absorbers used

Reaction: ^{70}Zn on ^{238}U at 460 MeV, $\Theta_{grazing}$=64°

Large background
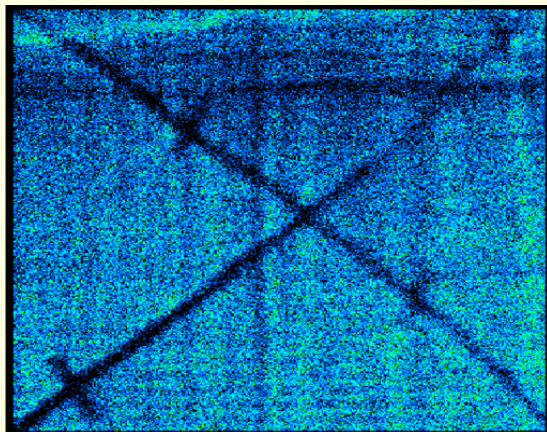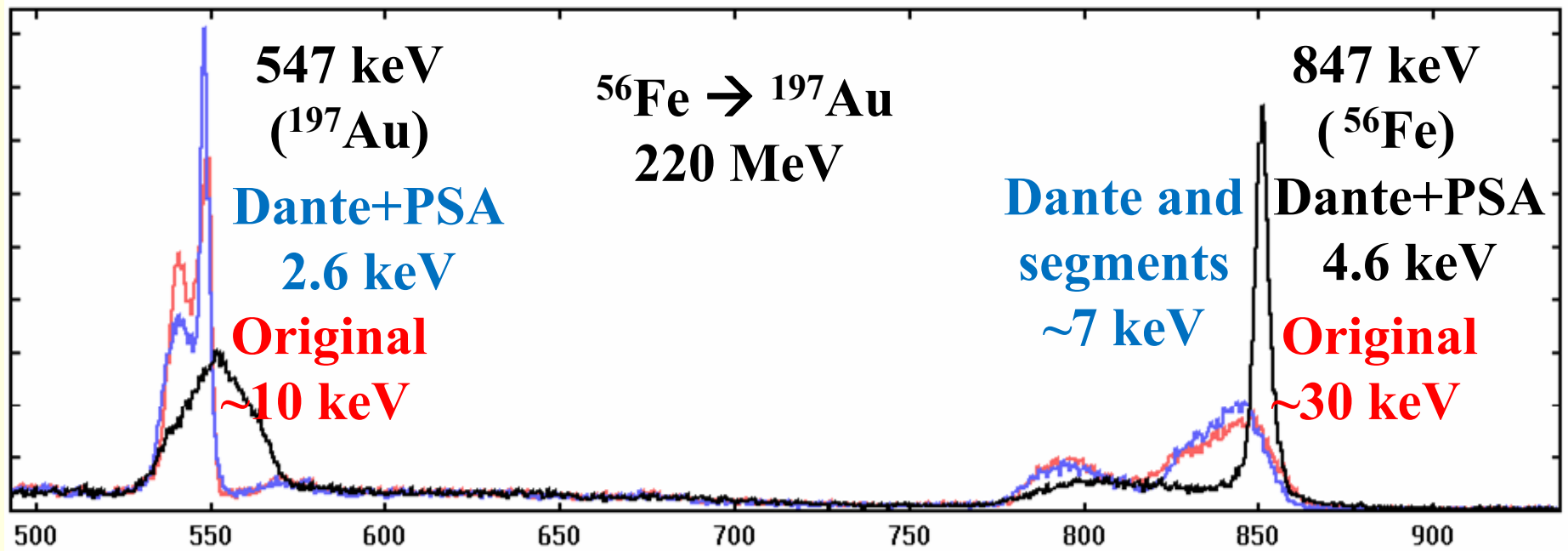
Performances with fission (2)

The wide angular range implies a large gain in statistics, but due to the background no γ-γ coincidence possible for exotic channels

Energy resolution 1.3%

First results for Coulex with AGATA

547 keV
(^{197}Au)

Dante+PSA
2.6 keV

Original
~10 keV

^{56}Fe → ^{197}Au
220 MeV

Dante and
segments
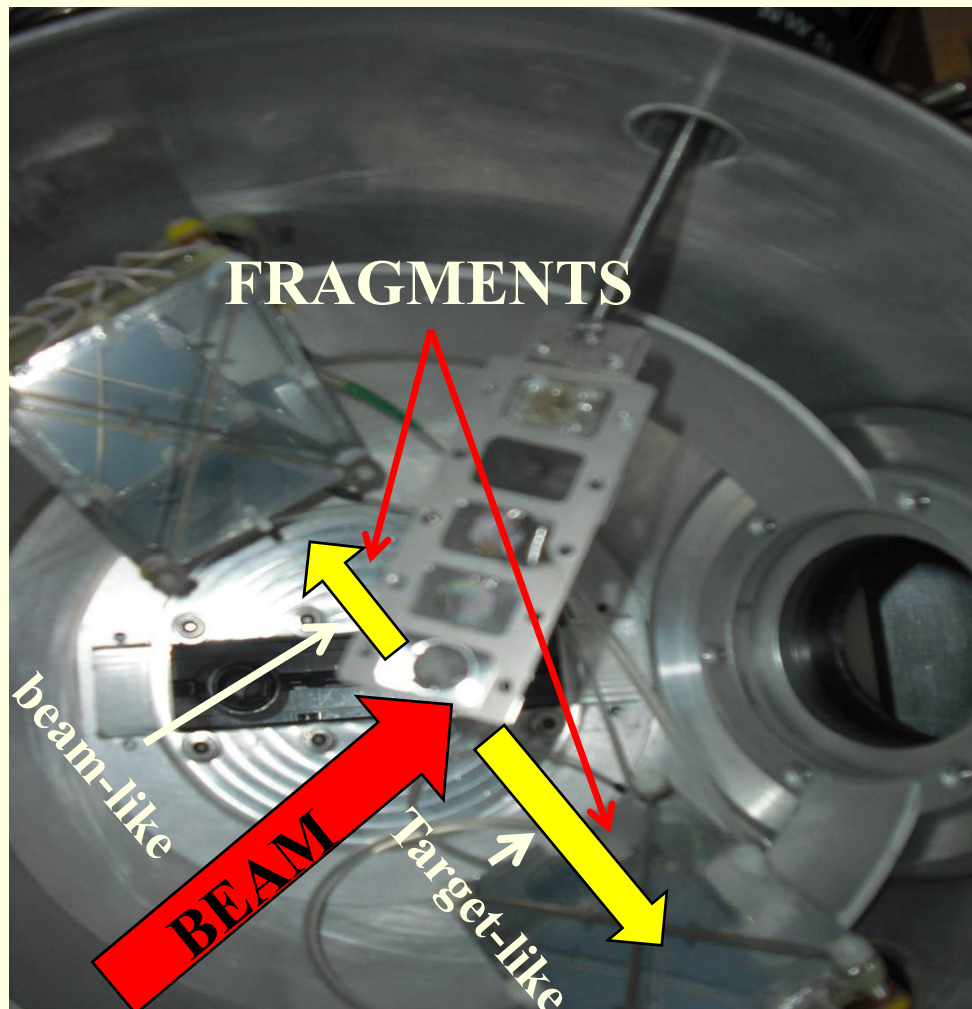~7 keV

847 keV
(^{56}Fe)

Dante+PSA
4.6 keV

Original
~30 keV

- Courtesy of D. Bazzacco
- See R. Venturelli's talk in the afternoon session for new results

Kinematic coincidences (1)

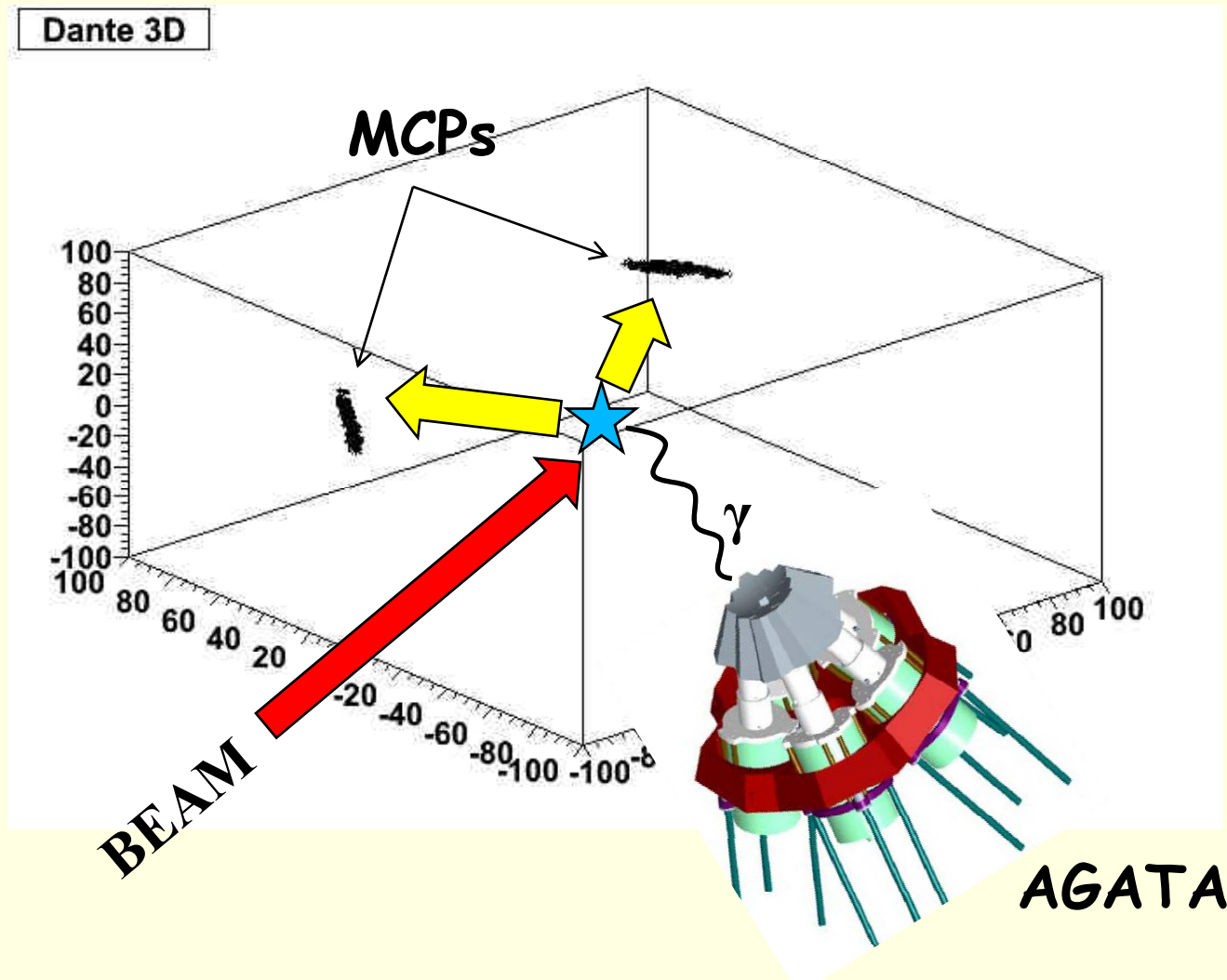Reaction: ^{58}Ni on ^{96}Zr at 235 MeV, $\Theta_{grazing}$=68°

A coincidence between the two MCPs is requested for trigger

The use of kinematic coincidences allows to clean the γ spectra
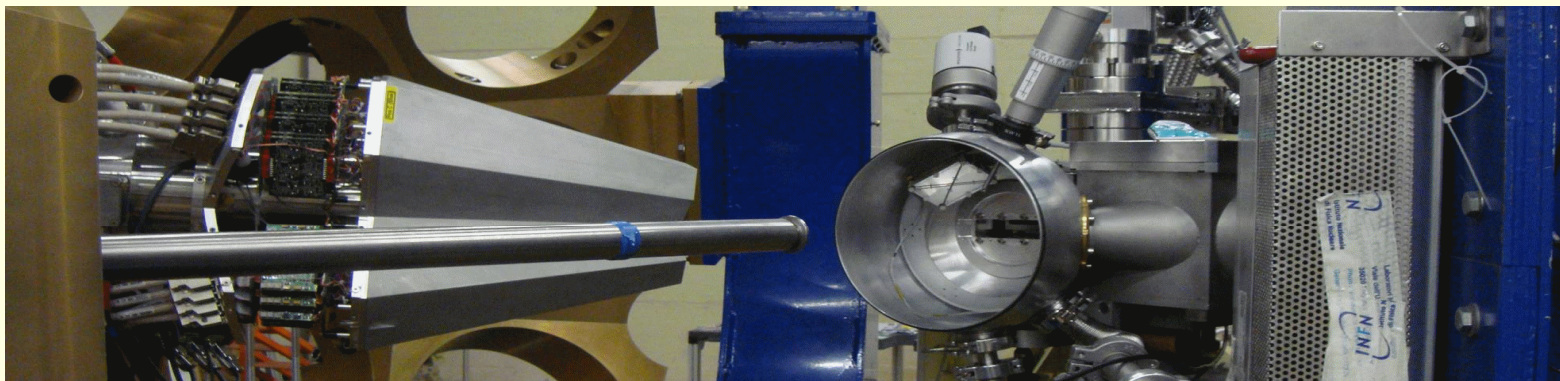
Kinematic coincidences (2)

Ongoing analysis on last experiment

Conclusions

1. DANTE is a heavy-ion detector with a large covering area, and few parameters (x,y,t)

2. DANTE measures the ion positions, thus enabling AGATA Doppler correction with an average velocity

Approved experiment: Coulex for ^{42}Ca

Four LoI with DANTE for AGATA @ LNL