CORSET and **GASP** combining

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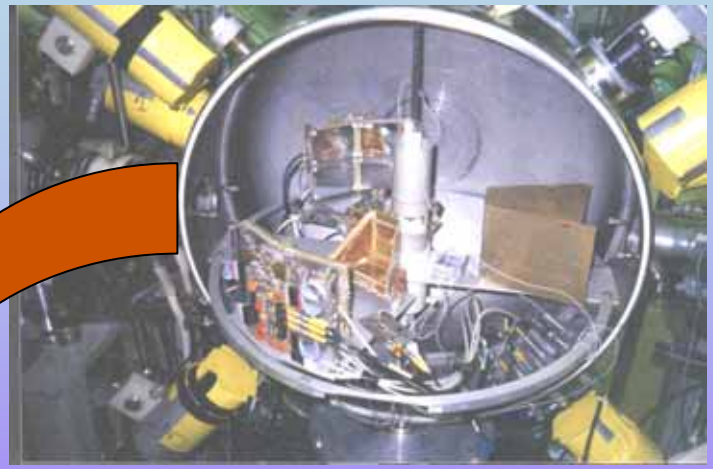
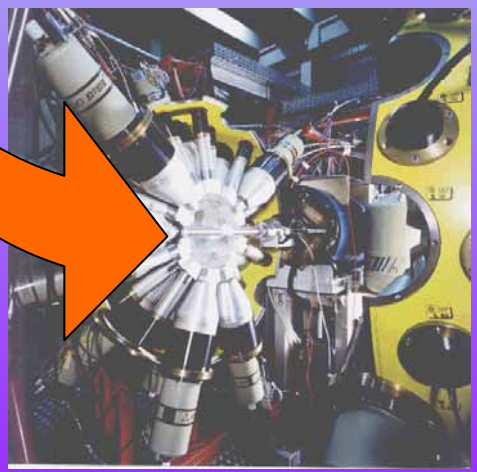


Double-arms time-of-flight position-sensitive spectrometer CORSET for the correlated measurements of the fission-like products of nuclear reaction.

Time resolution	120 - 150 ps
Mass resolution	~ 2 amu
Angular resolution	$\pm 0.3^0$
Position resolution	less 1mm

+



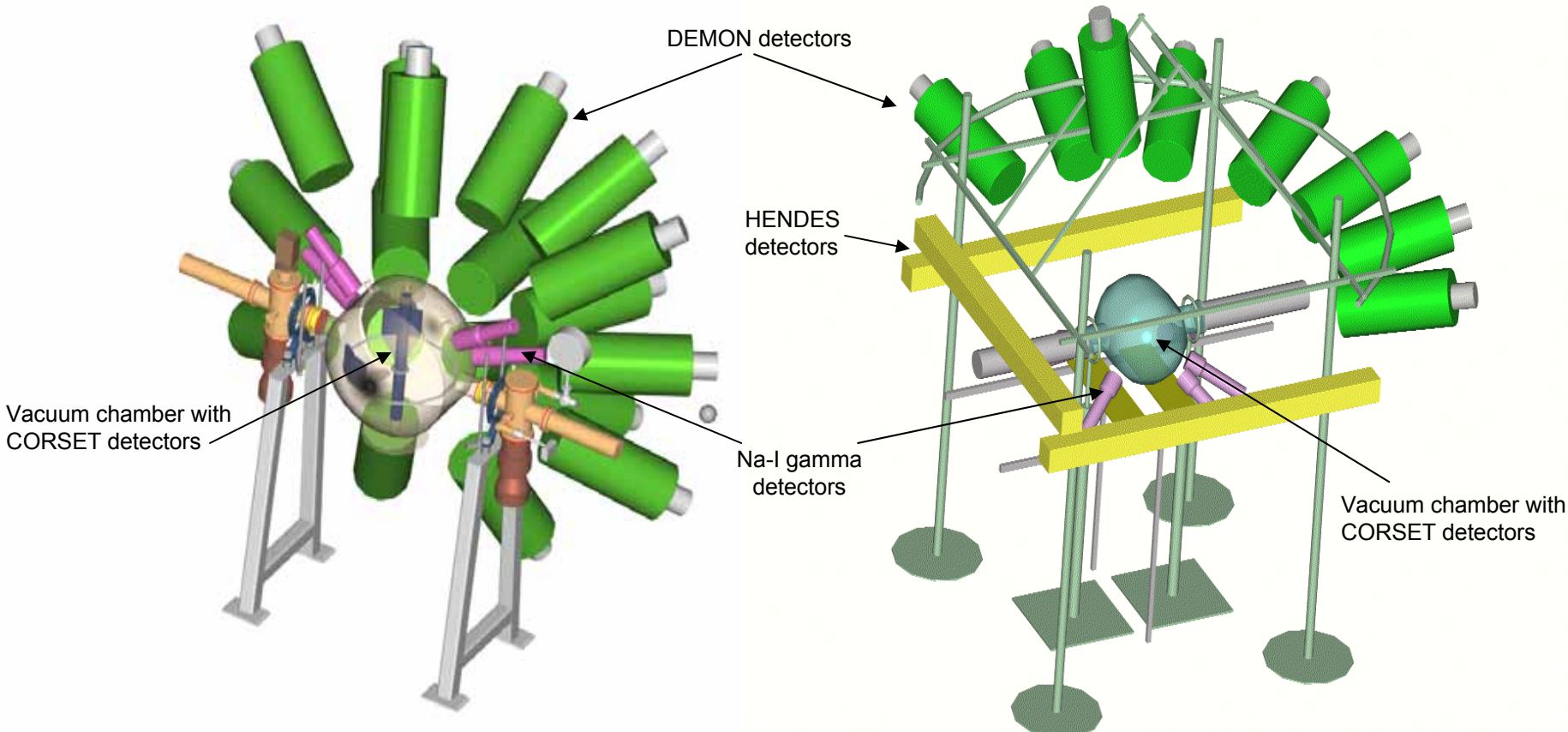
GASP Configuration I

The 40 germanium detectors are placed at **27 cm** from the target position and cover a total solid angle of 10% corresponding to a total absolute photopeak efficiency of **3%** at a gamma-ray energy of 1332 keV. For the 60Co source the Compton suppressed spectra have a mean P/T ratio of **60-65 %.** The average energy resolution at 1332 keV is better than **2.3 keV** and the average relative efficiency about **82%**..
A BGO multiplicity filter, made of 80 BGO cristals acts as a active collimator and measures the total energy and multiplicity of the gamma cascade.

CORSET as a trigger device in some experiments

CORSET+DEMON

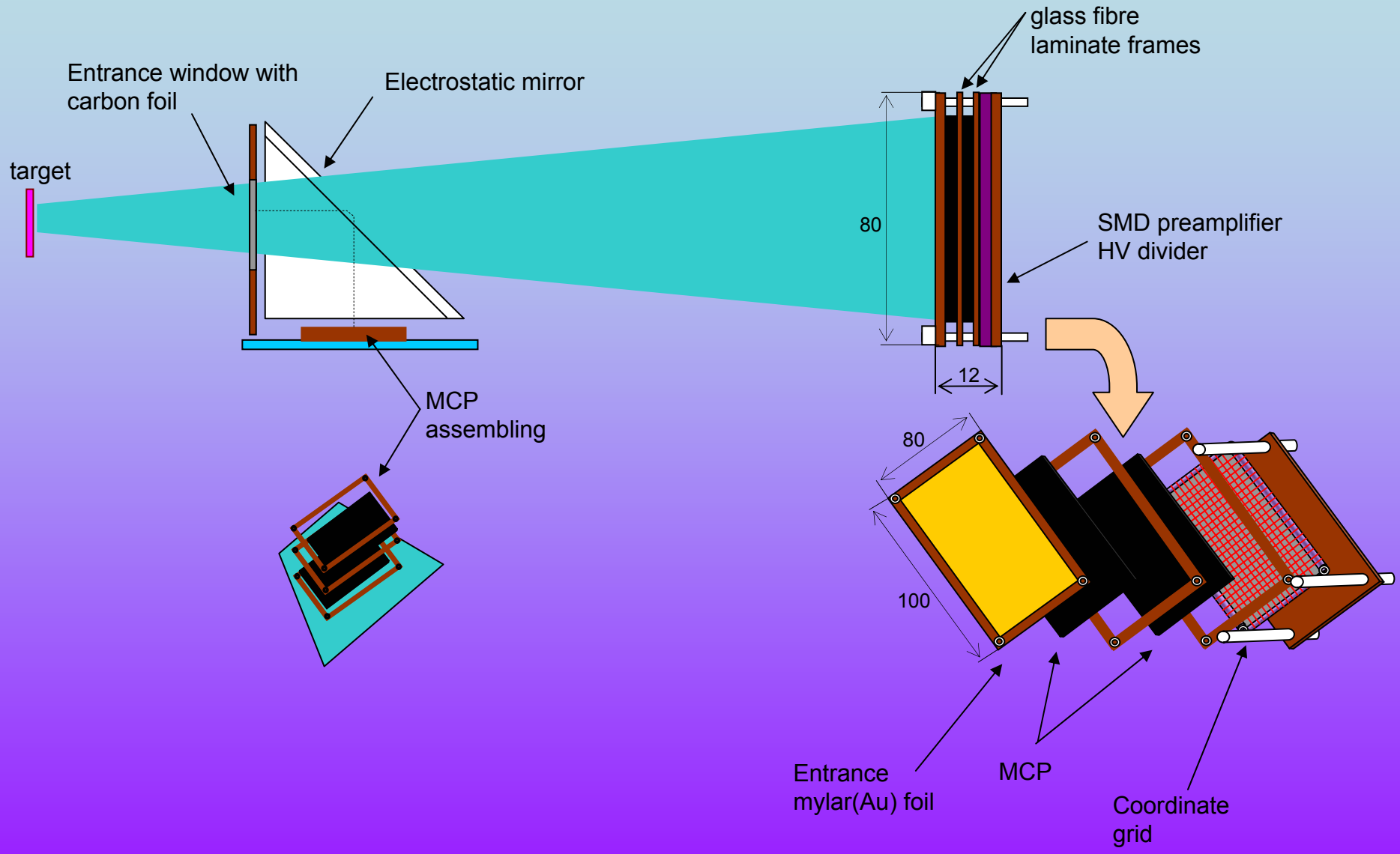
CORSET+DEMON
+HENDES



The physics applications imply the necessary attributes for ancillary devices :

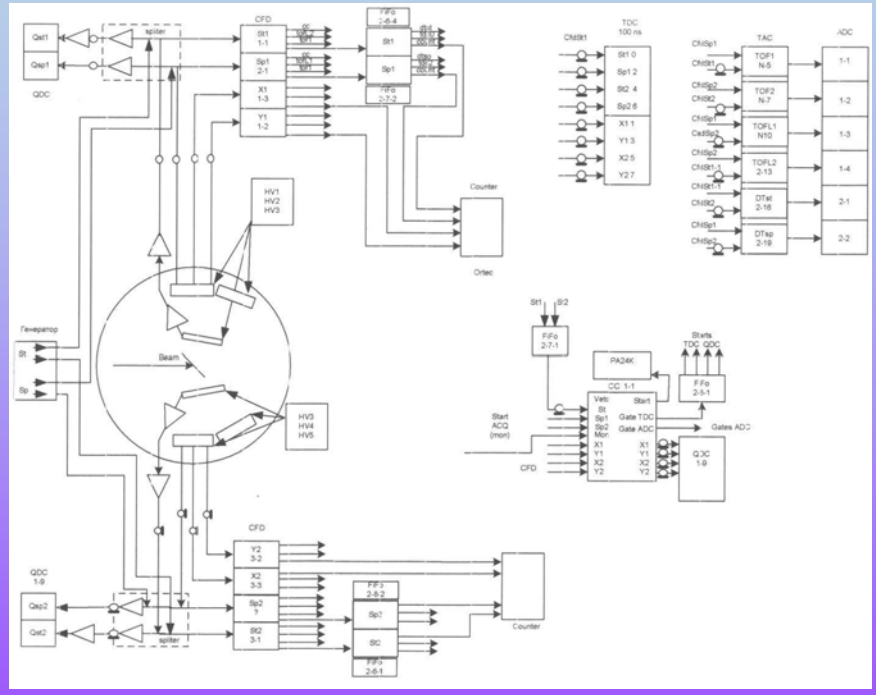
- minimum interference with γ-detection (low mass – to minimize absorption and scattering of γ-rays)
- a count rate capability not limiting the data rate of the γ-array
- maximum detection efficiency
- high angular resolution
- optimal time resolution (if in use Time-of-Flight method)
- changing detector's position without chamber deterioration

Start-Stop assambling



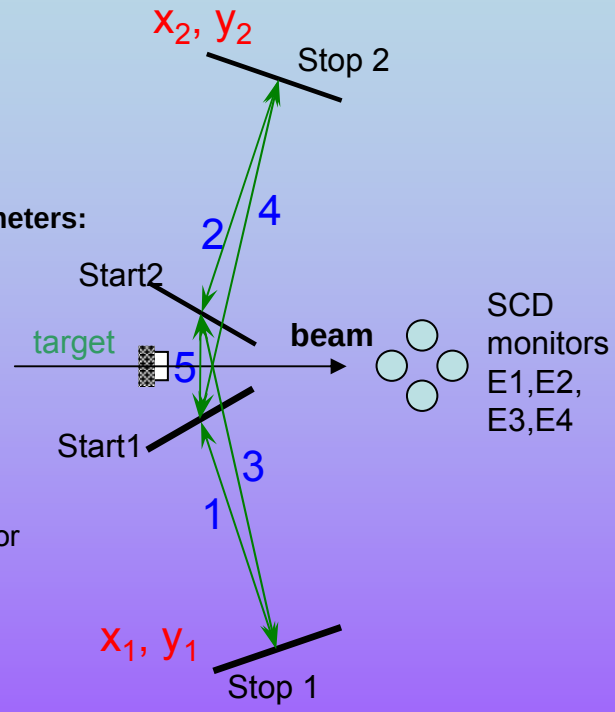
Organization of data acquisition

Electronic scheme



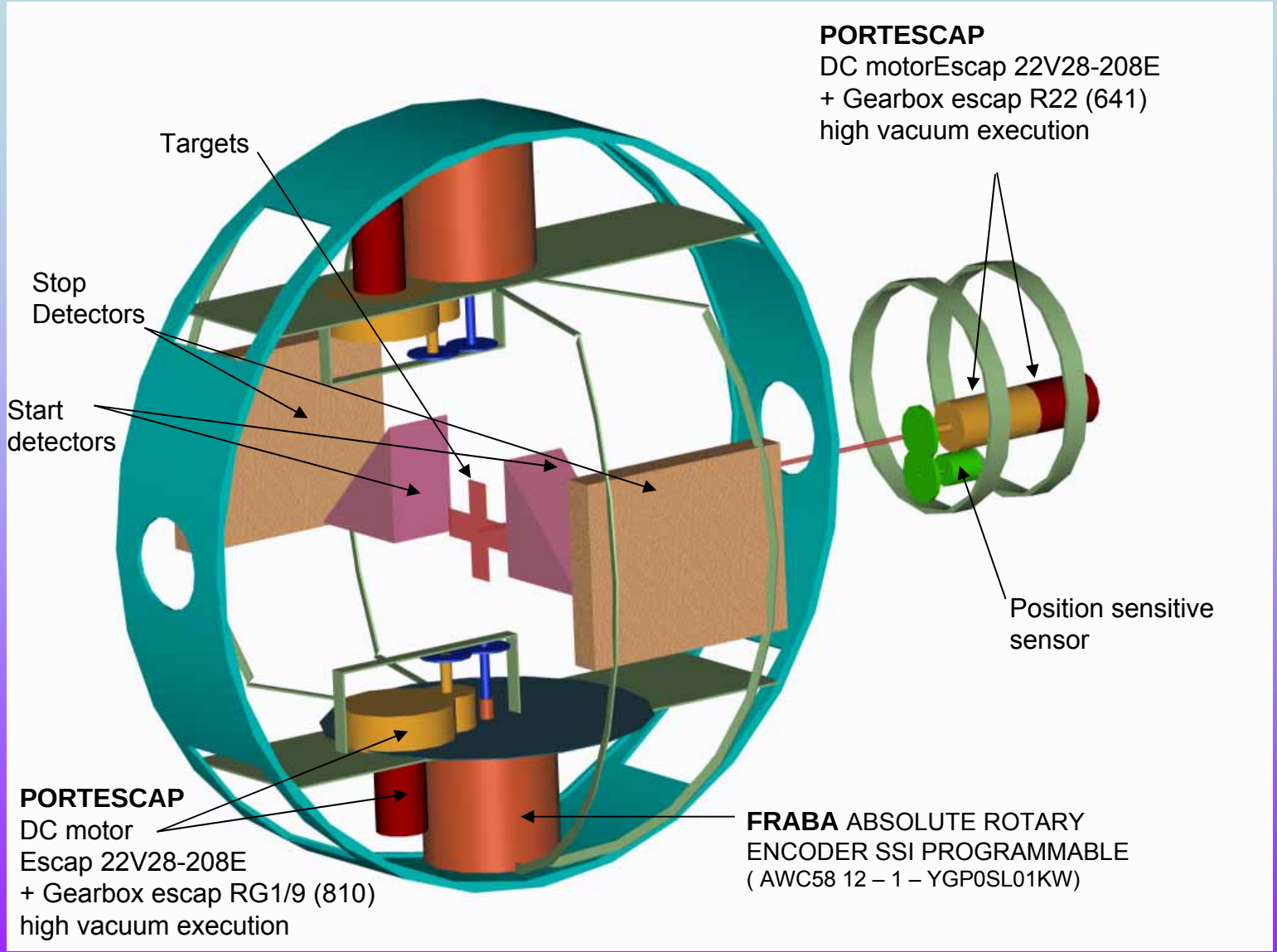
Acquired parameters:

1 – tof 1
2 – tof 2
3 – tofL1
4 – tof L2
5 – ΔT_{start}
+ x1,x2,y1,y2
+ E1-E4
+ counters
+ QDC channel for each detector



- Flight path about 8 cm in each arm
- Delay between event in target and signal from subsidence scheme about 100ns
- Count rate on start detector up to 100kHz
- Count rate in coincidence with stop detector up to several kHz

CORSET arrangement inside GASP



Realized construction

CORSET detectors on support ring
with servo-mechanism

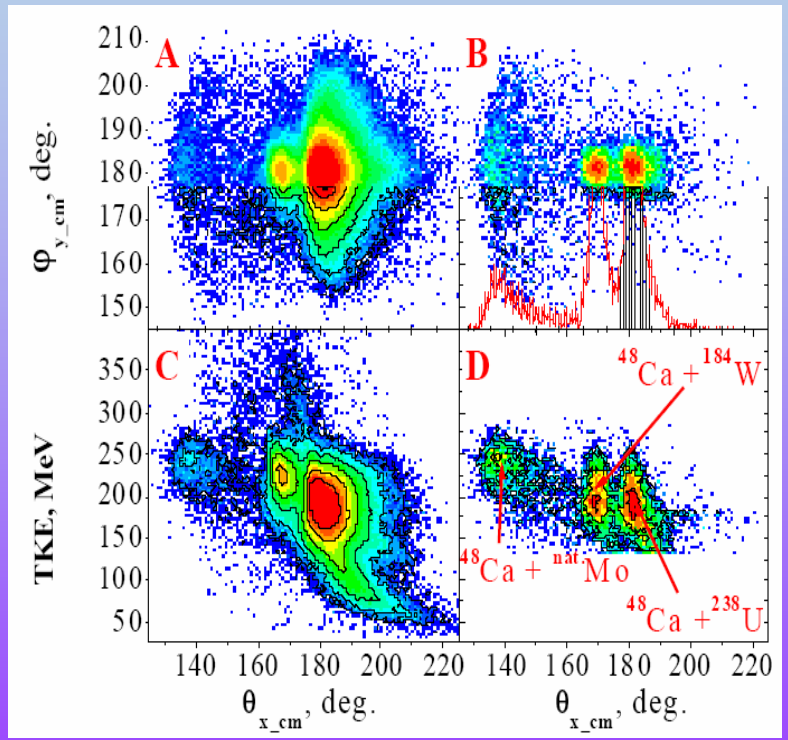
Target unit

Control unit

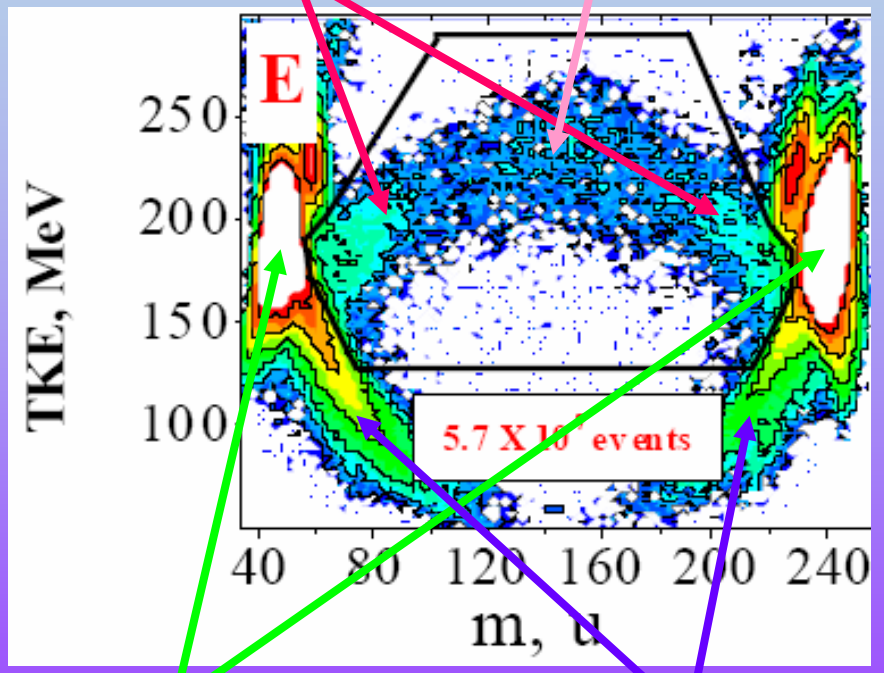
CORSET as a selective device for GASP

1. Possibility to select the reaction of interest

(*on picture: 48Ca + 238U* reaction with some impurities of Mo and W in target)



2. Possibility to select the reaction channel



3. Doppler correction of γ-rays, emitted in a flight

GASP for investigation of multimodal fission and quasifission

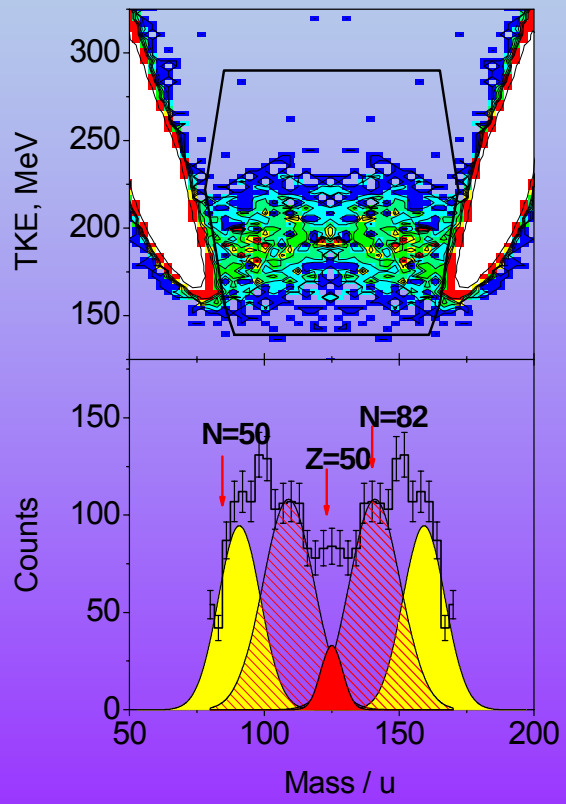
Understanding the fusion dynamics of two complex nuclei and evolution from a di-nuclear system to compound nucleus formation.

Get information about γ-rays

1. multiplicities
2. energy spectra
3. angle distribution

$^{64}Ni + ^{186}W \rightarrow ^{250}No$

E^{*}=31.5 MeV



MED for the reaction $^{64}Ni+^{185}W\rightarrow^{250}No$. The top plot is mass-TKE matrix, the bottom one is the mass distribution.

Possible CORSET pertormance buildup for GASP

- Increase area of stop detectors from 24 cm^2 to 50 cm^2
- Rebuild support ring
- Upgrade target unit
- Make control fully automated from PC