CSIC
Consejo Superior de Investigaciones Científicas

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Grupo de Física Nuclear Experimental
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Focal Plane Detection

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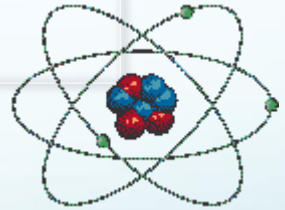
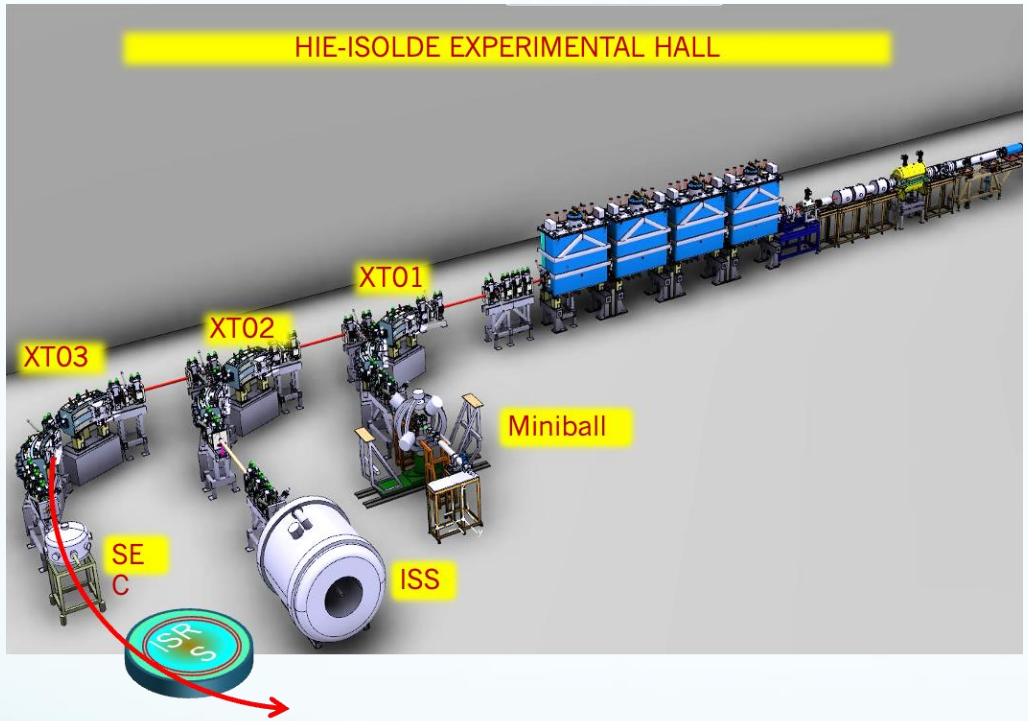
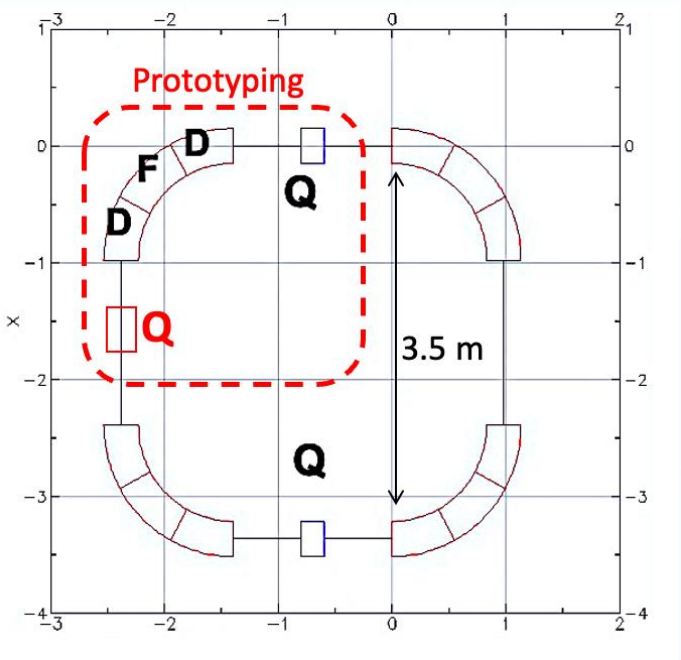
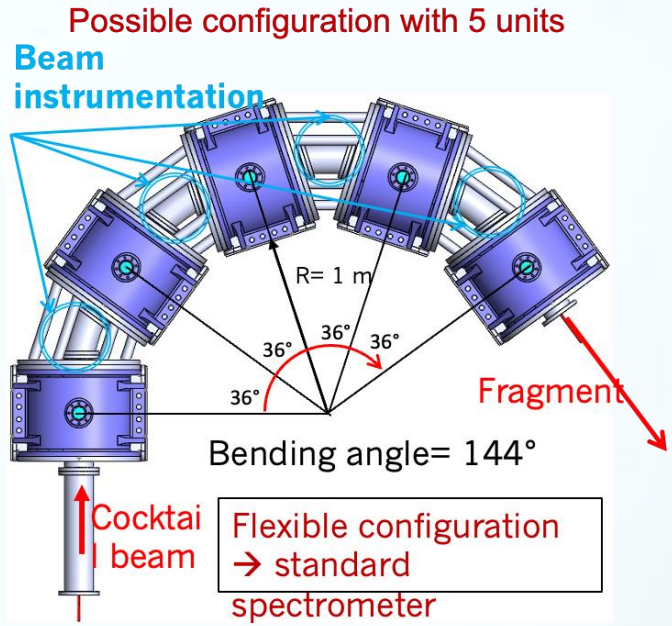


Focal Plane detection







Isotope detection by spacial separation

Array of SiC detector telescopes
50 μm + 500 μm

ring —> need to go for Time-of-Flight?

need a buncher with 1ns time-resolution

MWPC / SEE / SiC as Start direct after buncher
MWPC / SiC as stop at exit

Geant 4 Simulations for HIE ISOLDE (E. Nácher)

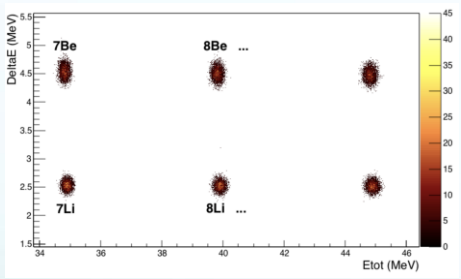
Telescope: Si ΔE detector of 20 × 20 mm2, 30 μm thick. Dead-layer: 100 nm
Si E detector of 20 × 20 mm2, 300 μm thick. Dead-layer: 700 nm

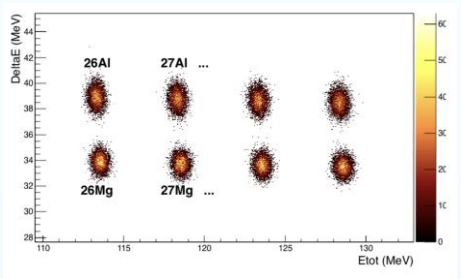
Intrinsic resolution: FWHM = 20 keV at 5 MeV

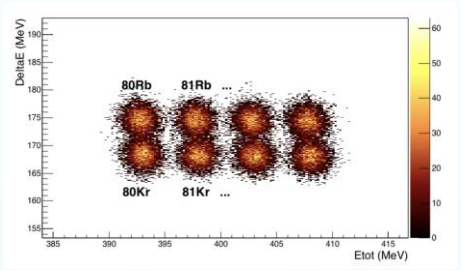
Beam: Ion beams of Li, Be, Mg, Al, Kr, Rb, Cs and Ba of different masses.
Geant 4 simulation

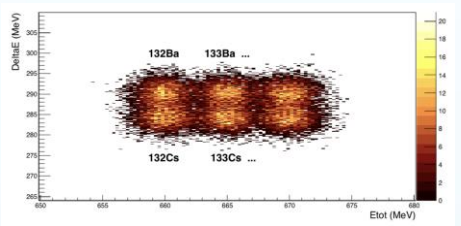
Spacial Separation → Array of SiC detector telescopes 50 μm + 500 μm

5 AMeV

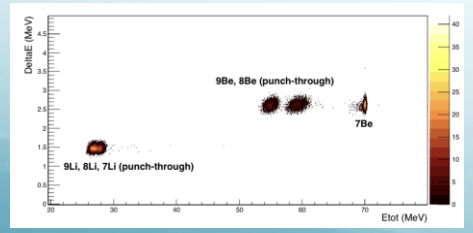


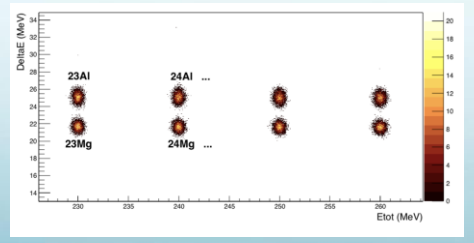


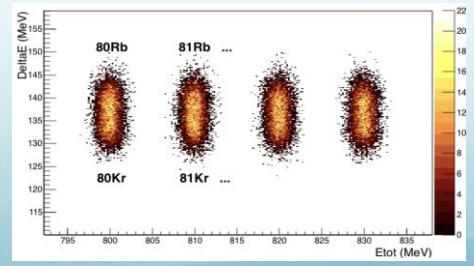


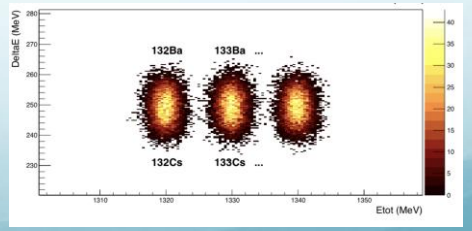


10 AMeV









Silicon Carbide to Replace Silicon Wafers

Silicon Carbide Ceramic as **Fast Neutron Detector** of Fission and Fusion Reactions in Fusion–Fission Hybrid Reactors

Iran J Sci Technol Trans Sci (2021) 45:1475–1483
https://doi.org/10.1007/s40995-021-01090-8

https://universitywafer.com/silicon-carbide-wafers.html?gad=1&gclid=CjwKCAjwkLCkBhA9EiwAka9QRkOpdMyK5uT2ccrsbNk0ZkFrjyrbgNP25RvRYbIChCnhiDACZbMcyRoCAC0QAvD_BwE

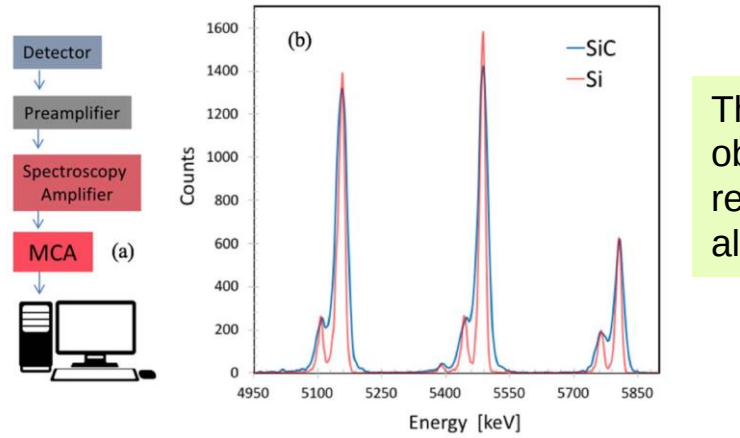


Figure 11. (**a**) Spectroscopic electronic chain used for the detectors test; (**b**) energy spectrum of alpha source (^{239}Pu, ^{241}Am, ^{244}Cm) measured by Hamamatsu S3590 Si detector and by our SiC prototypes. The average energy spread obtained for the Si detector is of the order of 0.22%, while we obtained about 0.4% for SiC.

The SiC detectors obtained an energy resolution of 0.4% 3x alpha. (22 keV)

Development of an associated particle imaging system with pixel SiC detectors Nuclear Inst. and Methods in Physics Research, A 1052 (2023) 168304

SiCILIA—Silicon Carbide Detectors for Intense Luminosity Investigations and Applications
Sensors **2018**, *18*, 2289; doi:10.3390/s18072289

SiC insensitive to temperatura 25 – 150°

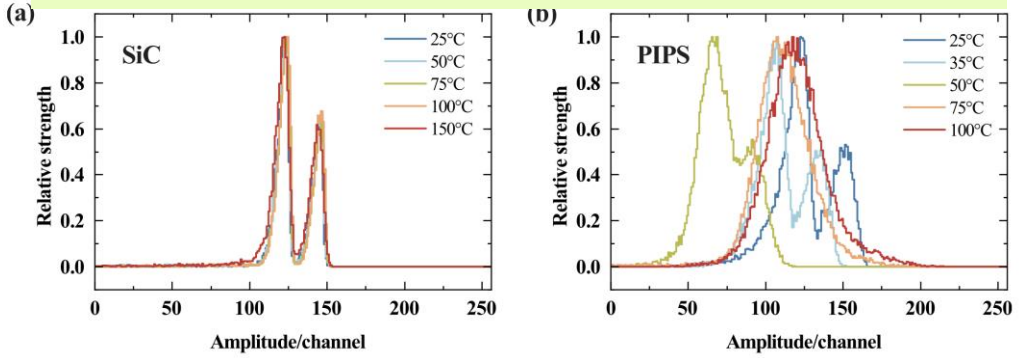


Fig. 9. The alpha spectrum of SiC and PIPS detectors at different temperatures: (a) spectrums of SiC detector in 25–150 °C; (b) spectrums of PIPS detector in 25–100 °C.