

A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue gradient background, resembling a circuit board or a neural network.

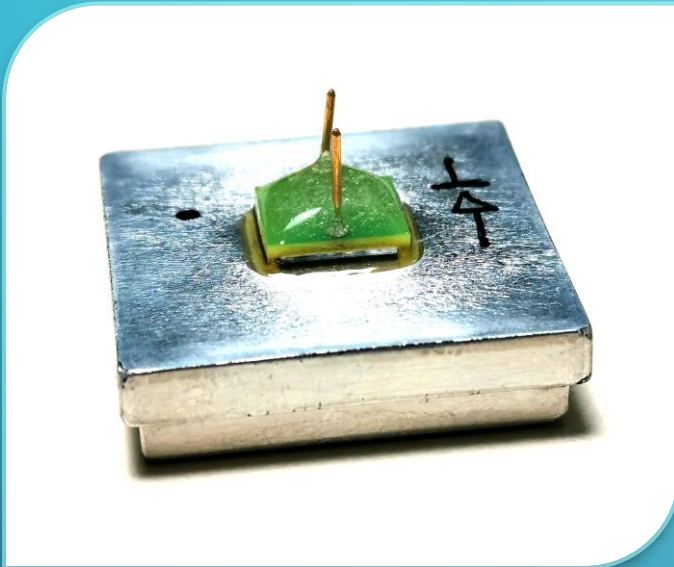
SIPM-BASED BETA DETECTORS

CATALIN NEACSU

IFIN-HH

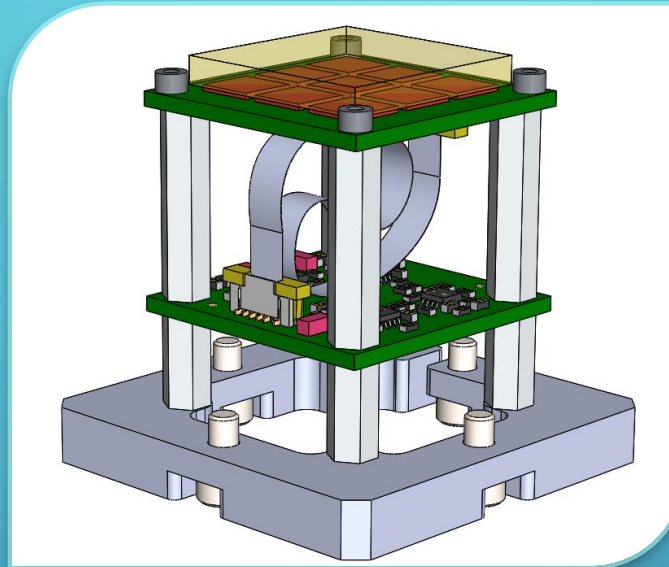
UNIVERSITATEA POLITEHNICA BUCURESTI

ISOLDE TAPESTATION: MINIATURE DETECTOR



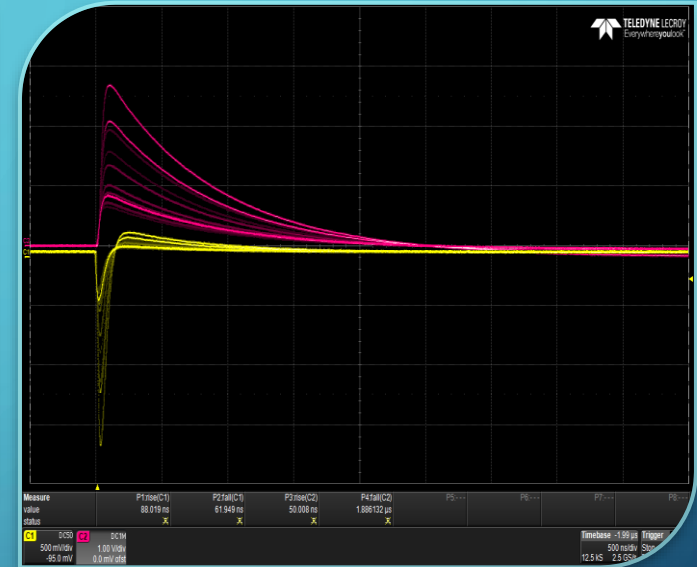
OLD DETECTOR

- Less scintillator coverage (lower efficiency)
- Directly wired sensor (difficult to debug and handle)
- Noisy timing filter amplifier as a FEE



NEW DETECTOR

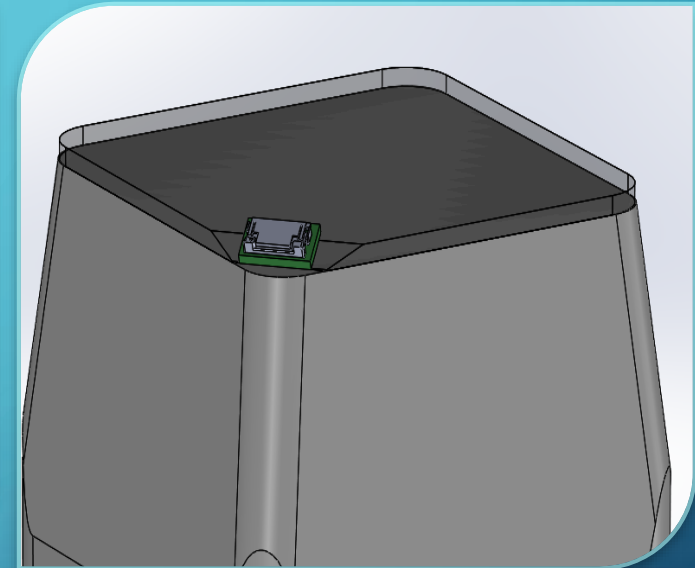
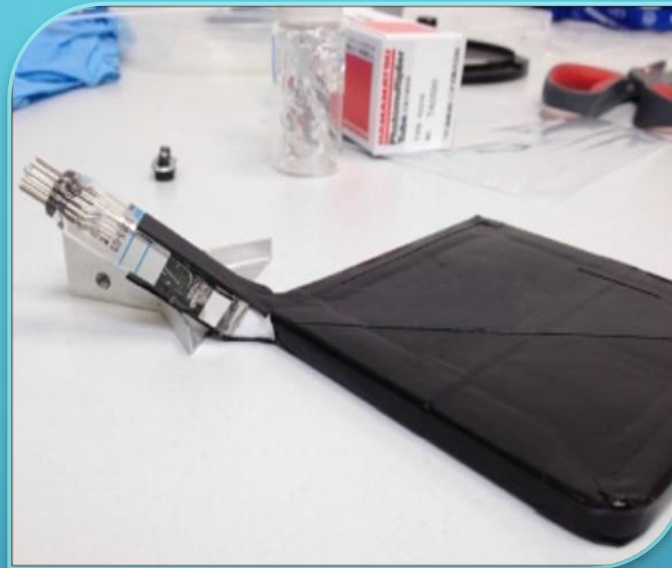
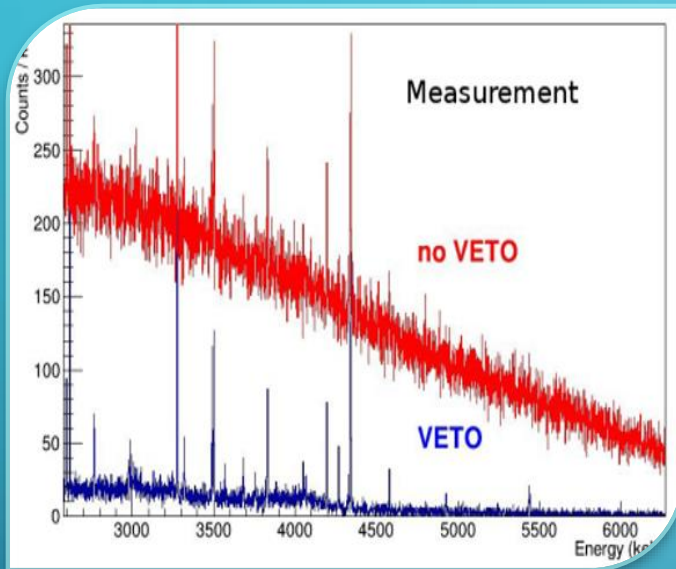
- Used for 2π and 4π detection, β - γ coincidences
- Miniature SiPM 3x3 Array and FEE, 30x30mm each
- Can be easily adapted to other applications.



FAST AND SLOW OUTPUTS

- Adjustable gain and offset. Configurable pulse polarity.
- Dual signal output, signals for both time (5ns rise time with plastic scintillator) and energy are available.

VETO DETECTORS FOR HPGE



HIGH ENERGY BACKGROUND

Normal spectrum measurements are seriously affected by background from incident high energy beta particles. A VETO system for filtering out these interactions allows much cleaner spectrum measurements.

PMT PROTO DETECTOR

- Mechanically fragile
- High Voltage Operation
- Occupies a high volume around HPGe detector

PROPOSED SOLUTION

- SiPM based beta detector + very thin pad scintillator
- Small size solution
- Adjustable gain and offset. Configurable pulse polarity.
- Dual signal output

OTHER DETECTORS DEVELOPED BY IFIN-HH



2" DETECTOR

3.2(1)% energy resolution

15ns fast signal rise time

236(3)ps CRT

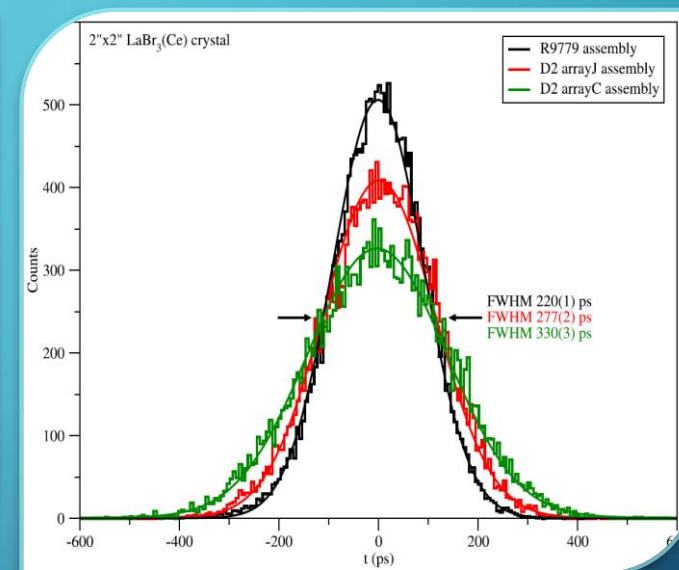


3" DETECTOR

3.2(1)% energy resolution

18ns fast signal rise time

298(3)ps CRT



2" LABR3(CE), PMT VS SIPM, CRT FWHM

PMT R9779: 220(1)ps

ARRAYJ SiPM (ONSEMI): 277(2)ps

ARRAYC SiPM (ONSEMI): 330(3)ps

An abstract graphic on the left side of the slide, consisting of a network of white lines and small circles on a dark blue background, resembling a circuit board or a neural network. The lines are of varying thickness and connect to small white circles at various points.

THANK YOU