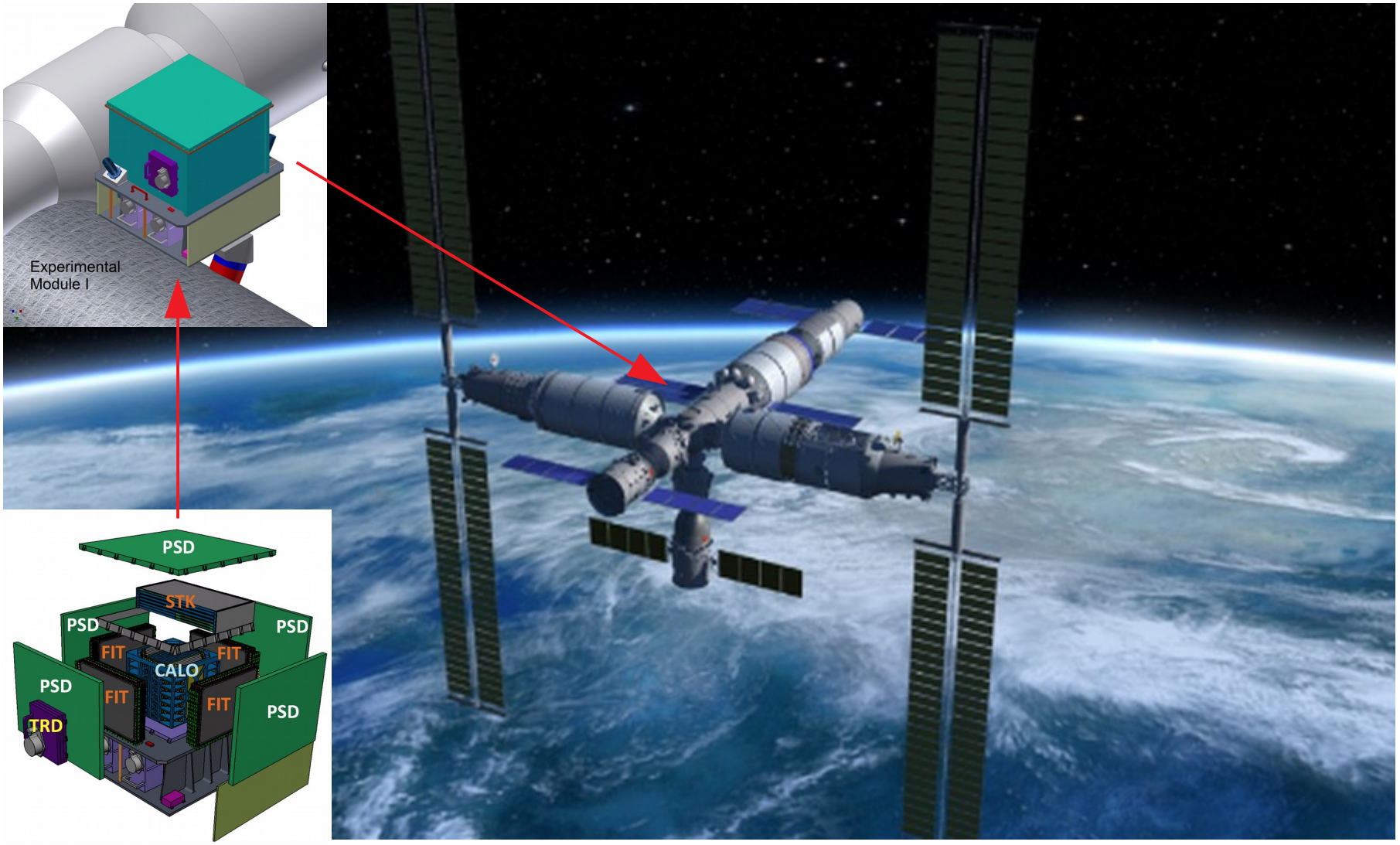
The HERD space mission



Recent work and future updates on the bar geometry

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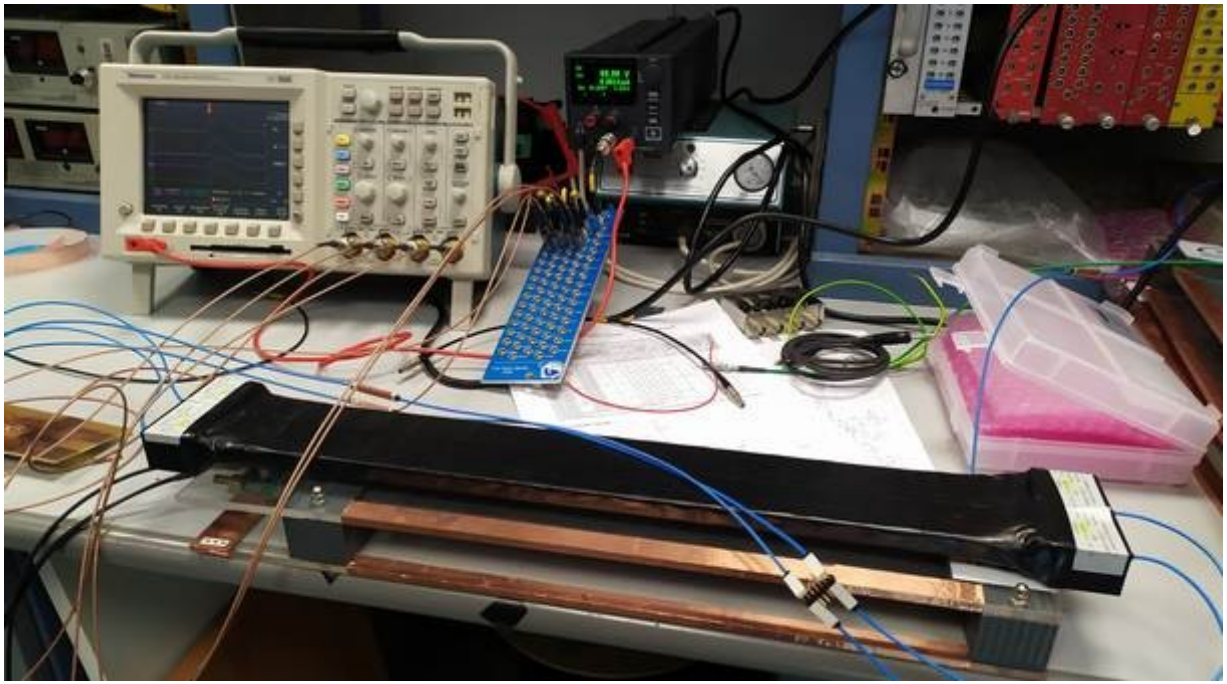
Preparation of a new bar

SiPM model	S13360 – 3025CS
Effective area (mm)	3 x 3
Cell count	14400
Cell size (μm)	25
Cell fill factor (%)	47
Response range (nm)	270 – 900
Peak sensitivity (nm)	450
PDE (%)	25
Breakdown voltage (V)	65 ± 10
Overvoltage (V)	5.0
Dark count rate	400 – 1200 (kcps)
Gain	7 x 10^5

Preparation of a new bar with 2 x 2 SiPMs

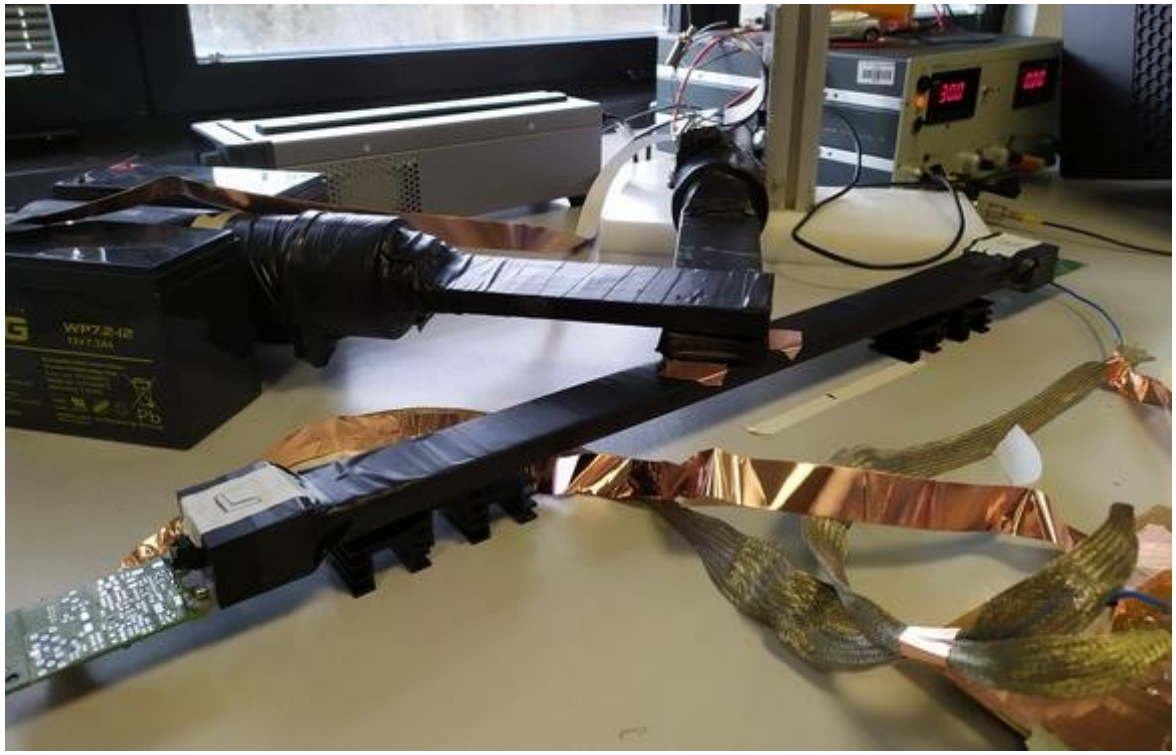
- Size: [50 x 6 x 1 cm]
- Instrumentation with Hamamatsu SiPMs



Working point test of the existing bar

Test of existing bar with 1 x 1 SiPMs

- Size: [50 x 3 x 1 cm]
- Instrumentation with AdvanSiD SiPMs



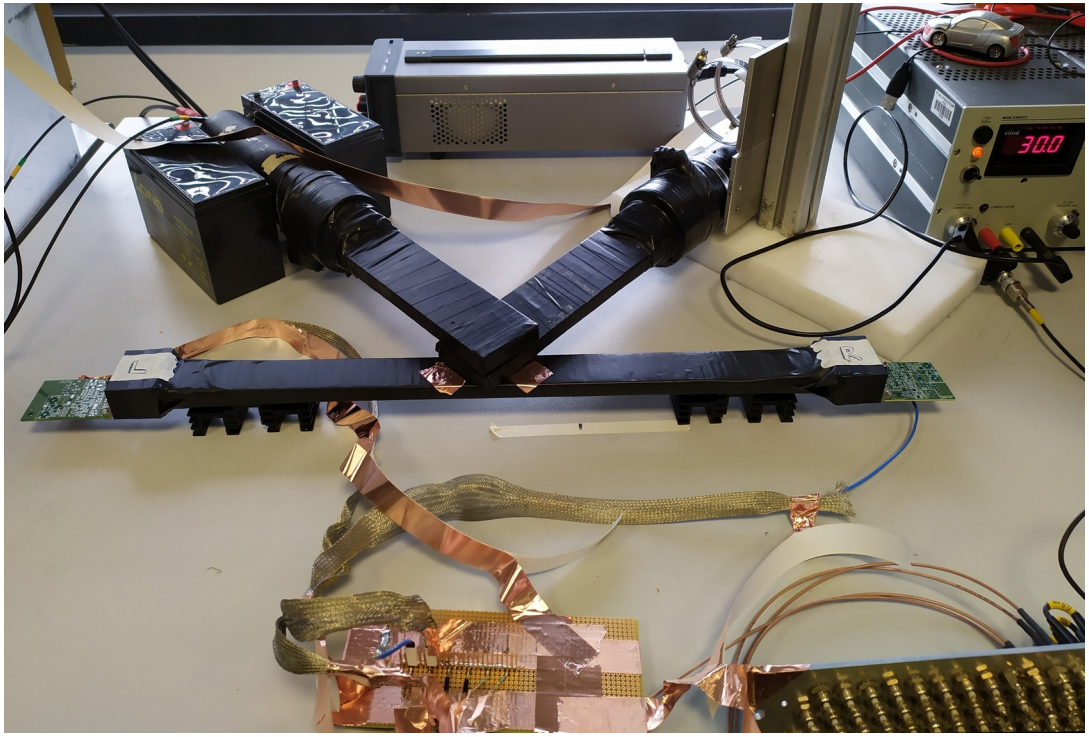
SiPM model	ASD – NUV3S
Effective area (mm)	3 x 3
Cell count	5520
Cell size (μm)	40
Cell fill factor (%)	60
Response range (nm)	350 – 900
Peak sensitivity (nm)	420
PDE (%)	43
Breakdown voltage (V)	24 – 28
Overvoltage (V)	2 – 6
Dark count rate	50 – 100 (kHz/mm^2)
Gain	3.6 x 10^6

Working point test of the existing bar

Test of existing bar with 1 x 1 SiPMs

- Size: [50 x 3 x 1 cm]
- Instrumentation with AdvanSiD SiPMs

Trigger fixed at the center



Measurement principle

Starting from low HV and increasing up to the onset of a plateau-like feature in the efficiency

Measurements Acquired

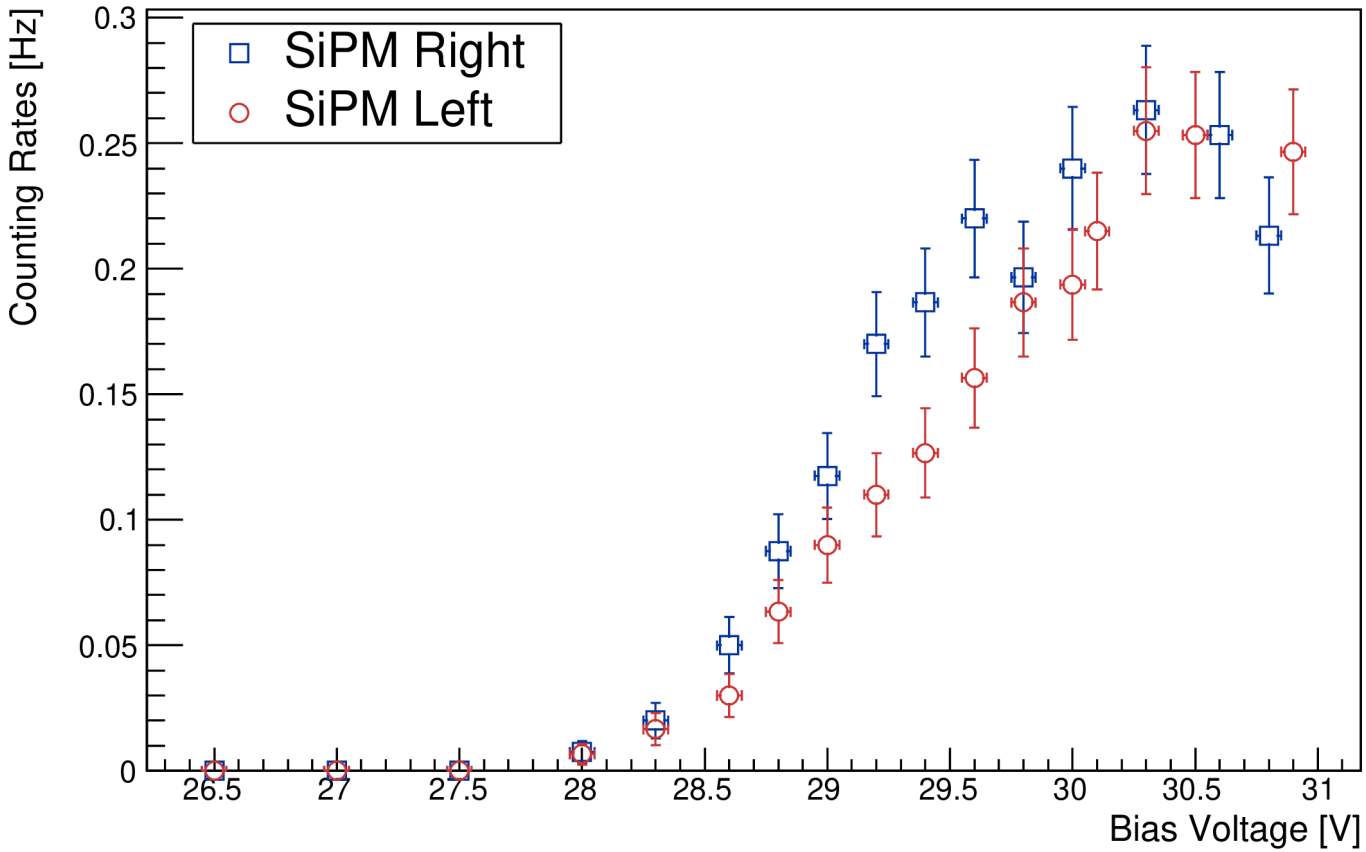
Single SiPM rate

Trigger rate (2 interleaved PMTs)

Coincidence between trigger & SiPM

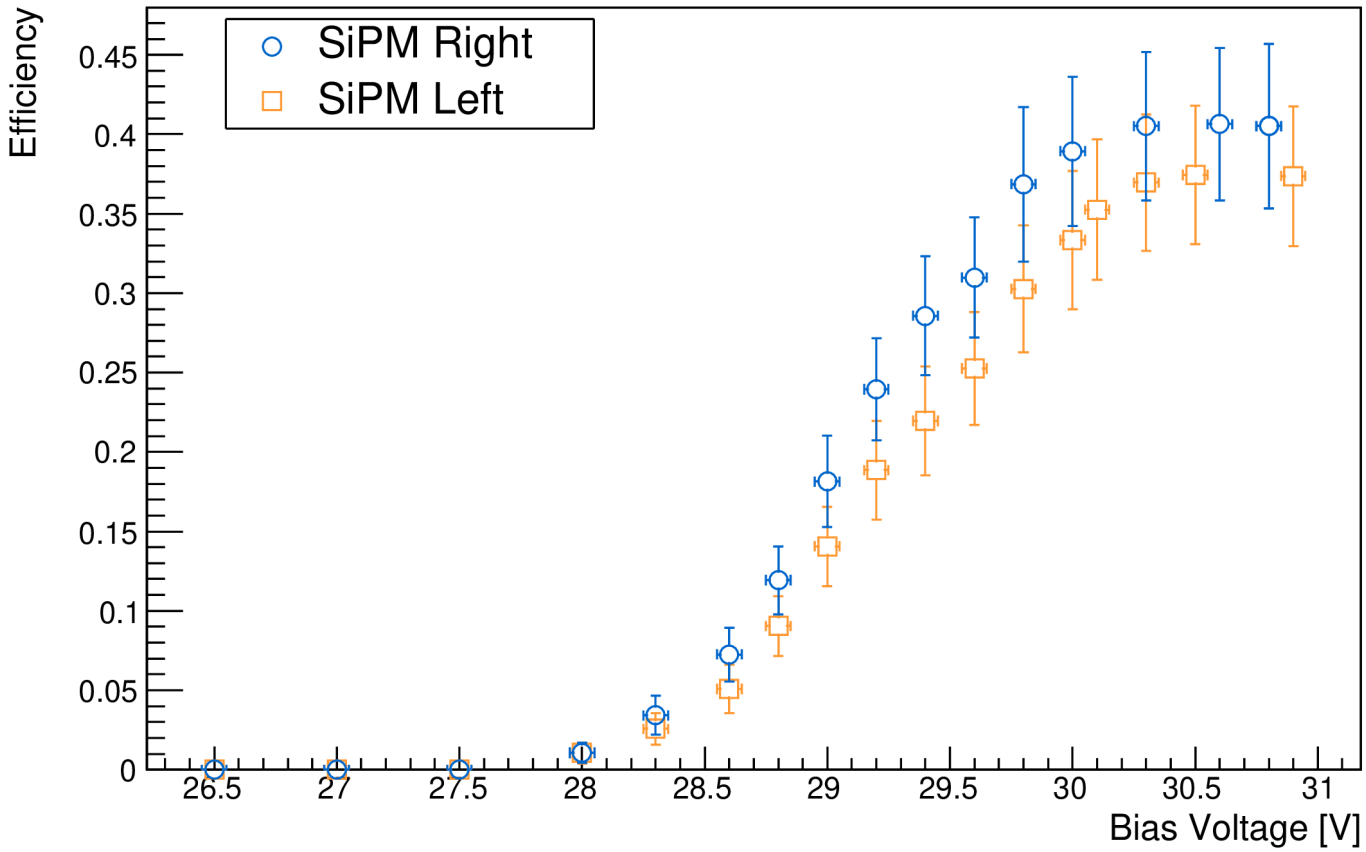
Working point test of the existing bar

Results on Counting Rates



Working point test of the existing bar

Results on Efficiencies



Future Tasks

Regarding the 1 x 1 SiPM AdvaSiD bar

1) Retake few of the previous measurements for the sake of completion
2) Setup the data acquisition with the LeCroy system and receive: Amplitude, Charge, peak-to-peak data in different trigger positions
3) Possibly use a source in order to scan the bar efficiently

Regarding the 2 x 2 SiPM Hamamatsu bar

1) Optimize the signals and minimize configuration' noise
2) Contact Giovanni for further updates regarding the CAEN DAQ
3) Otherwise proceed with analogous measurements with our previous setup (LeCroy)

Bonus Slide

Construction and provision of a bar support for a future (?) beam-test from the Bari group