

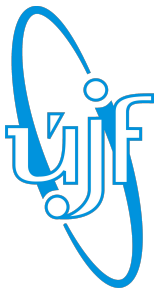
Progress report on CANDY silicon detector

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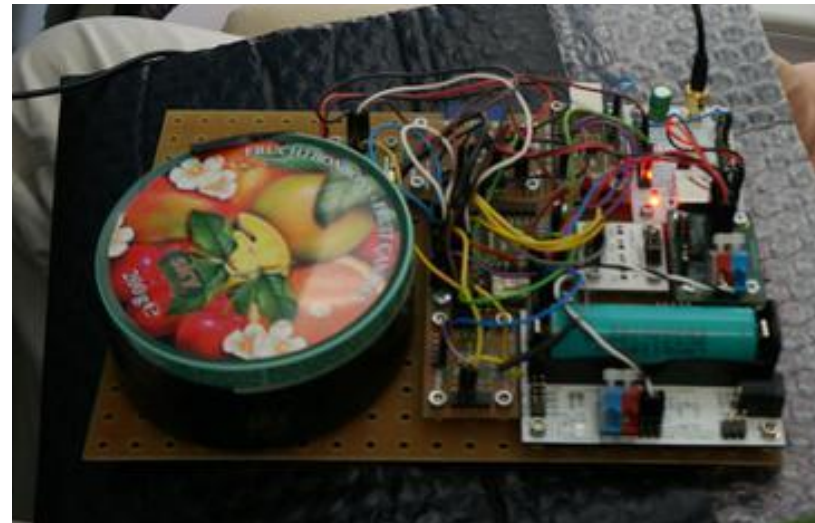
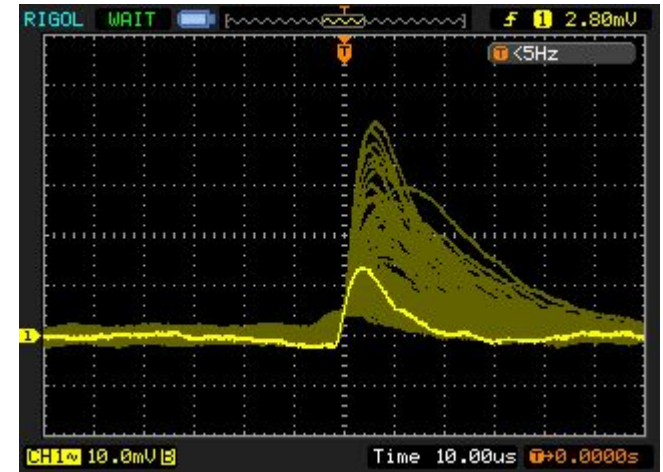
2 Czech Technical University in Prague, Czech Republic

3 Universal Scientific Technologies s. r. o., Soběslav, Czech Republic



Candy detector - Design goals

- Lightweight (Silicone detector)
- Low power consumption
- Low noise
- (Low cost)
- LET spectrometer

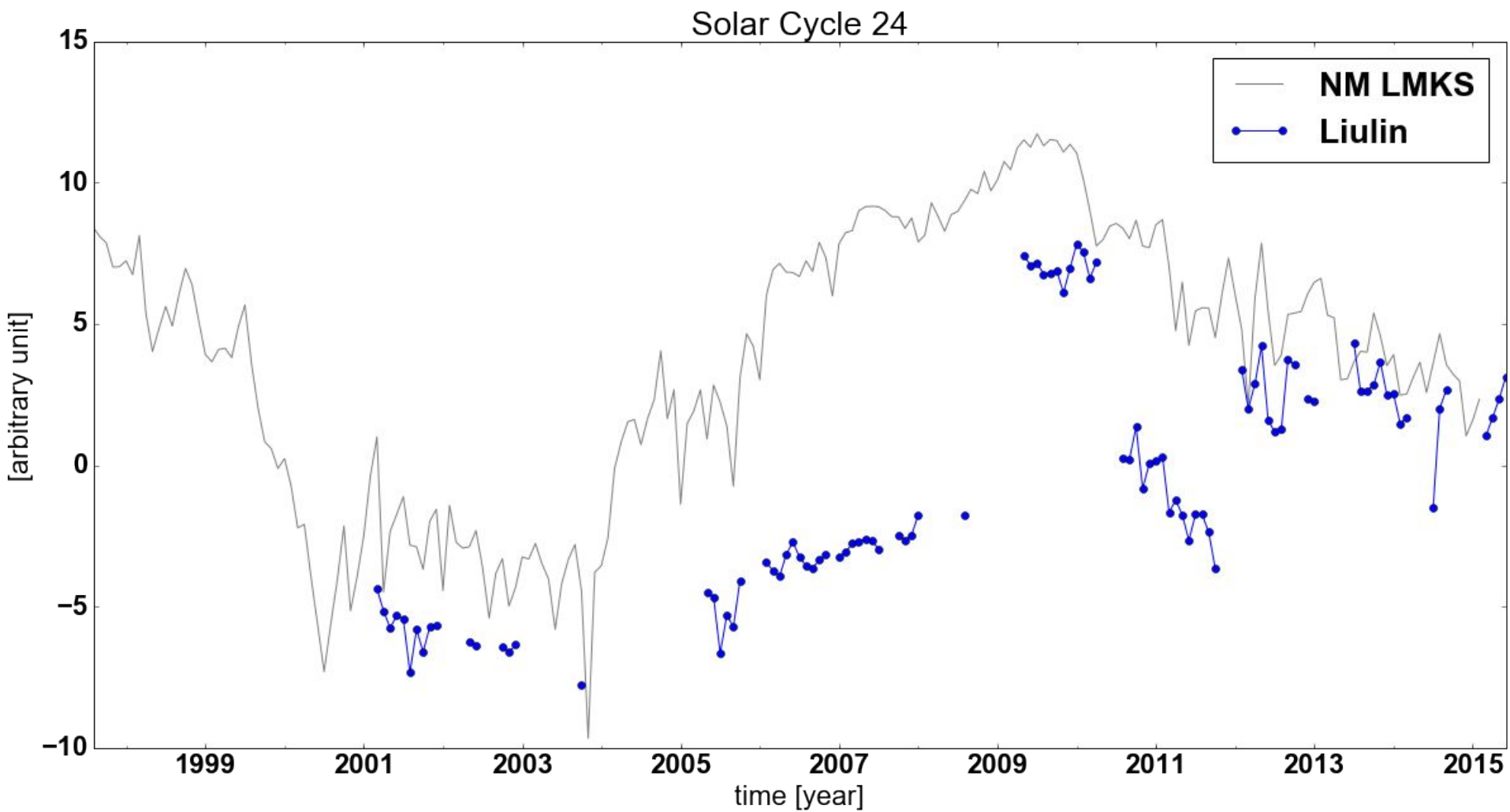


<http://www.mlab.cz/Modules/Sensors/PCRD02A/DOC/PCRD02A.cs.pdf>

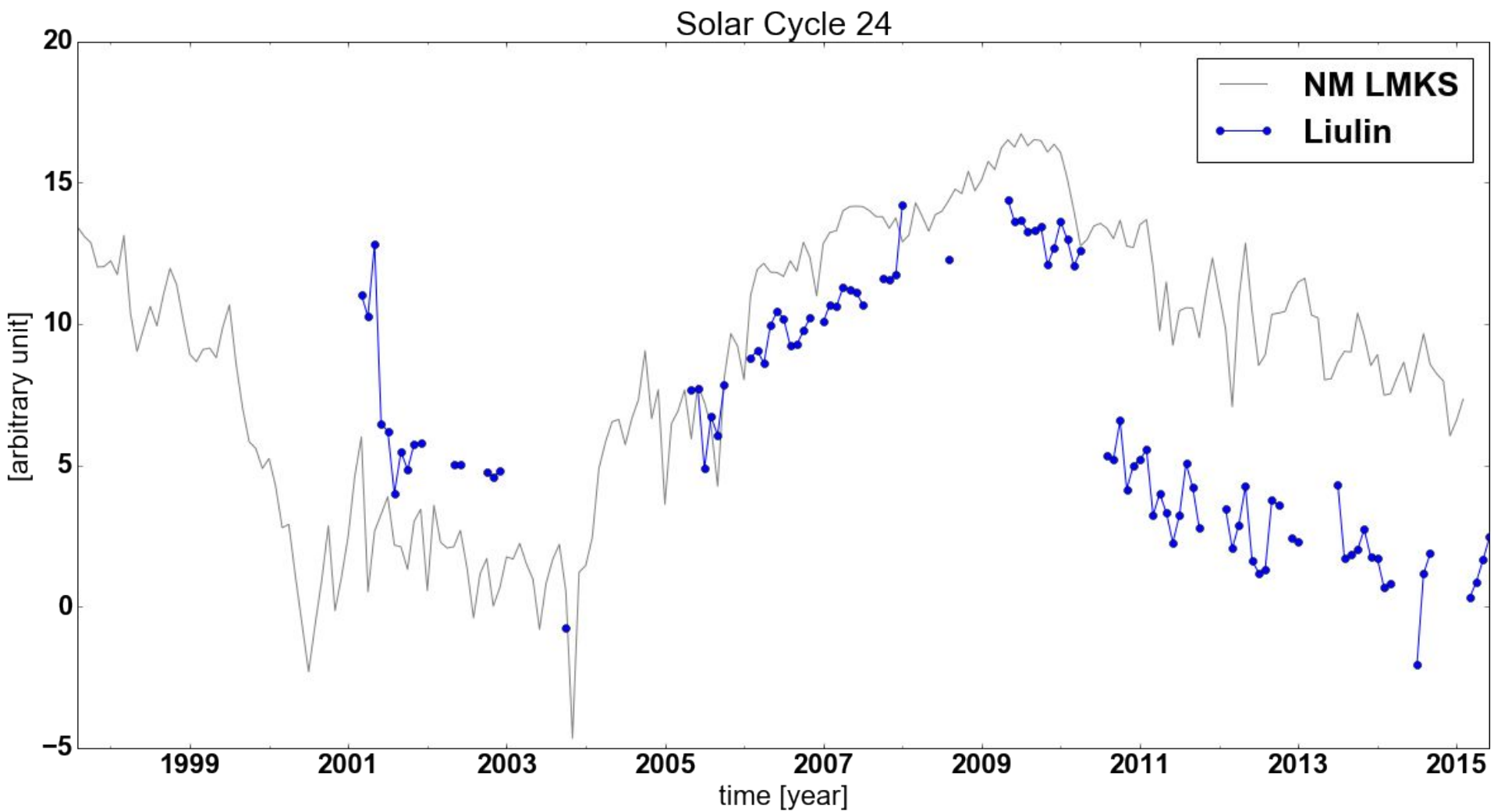
Why new Si based dosimeter?

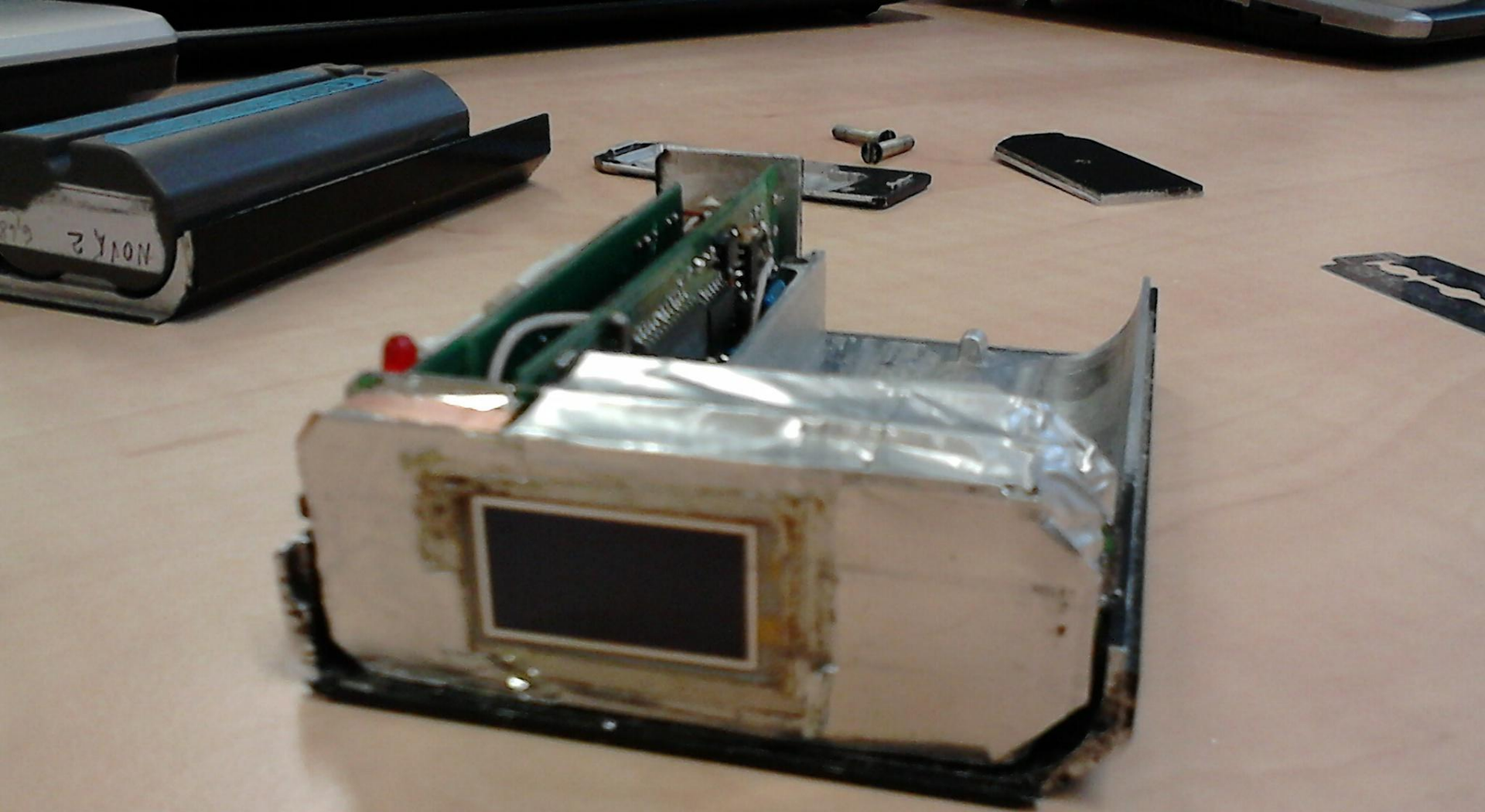


Long Term Measurements



Without calibration

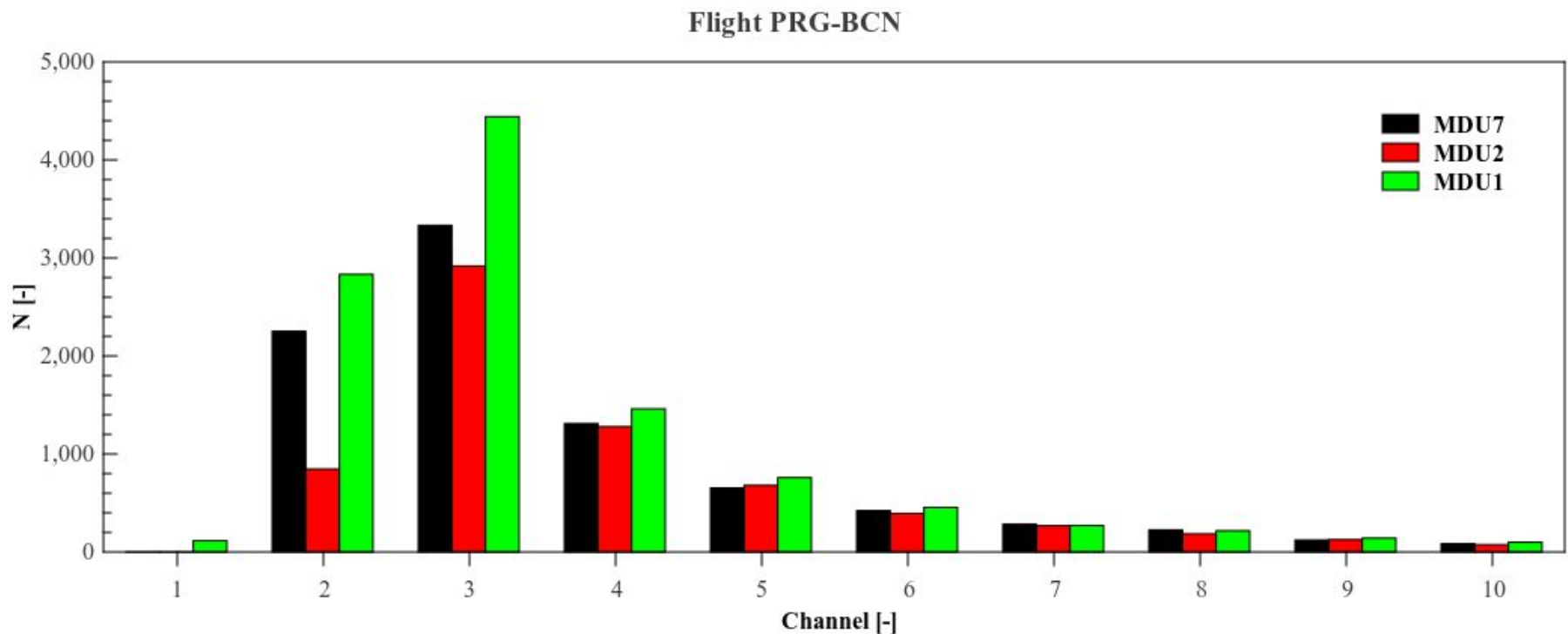




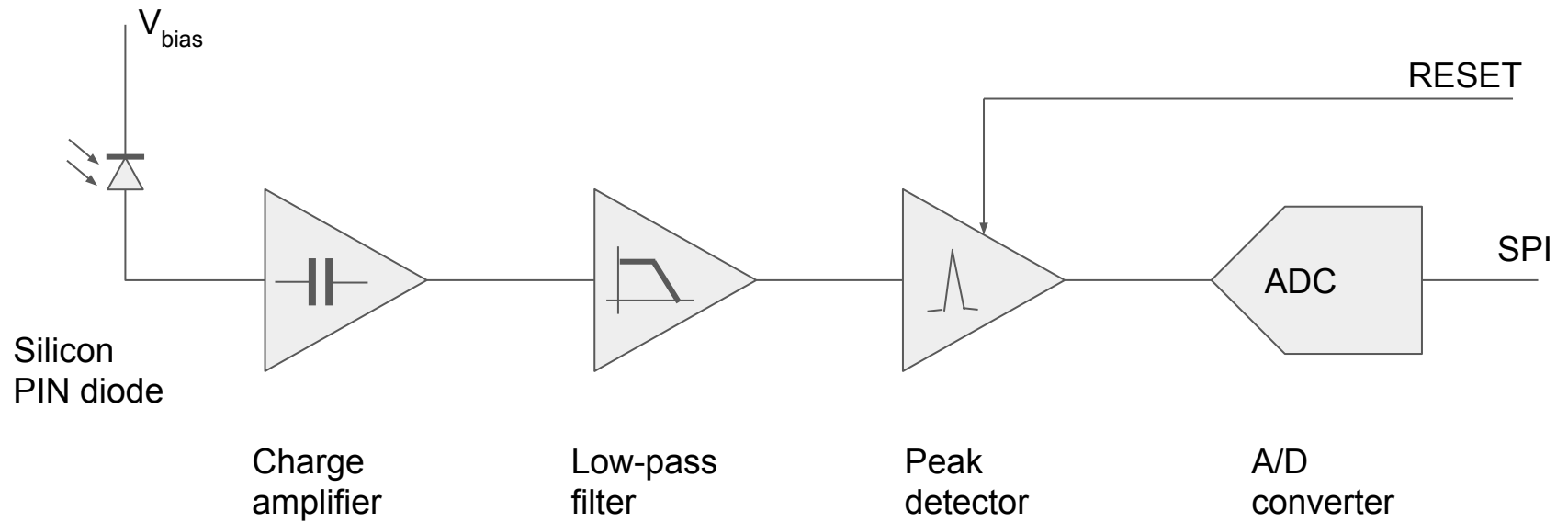
Diode was replaced

Liulin was exposed to Am-241, Cf-252, Pu-239 in vacuum like conditions

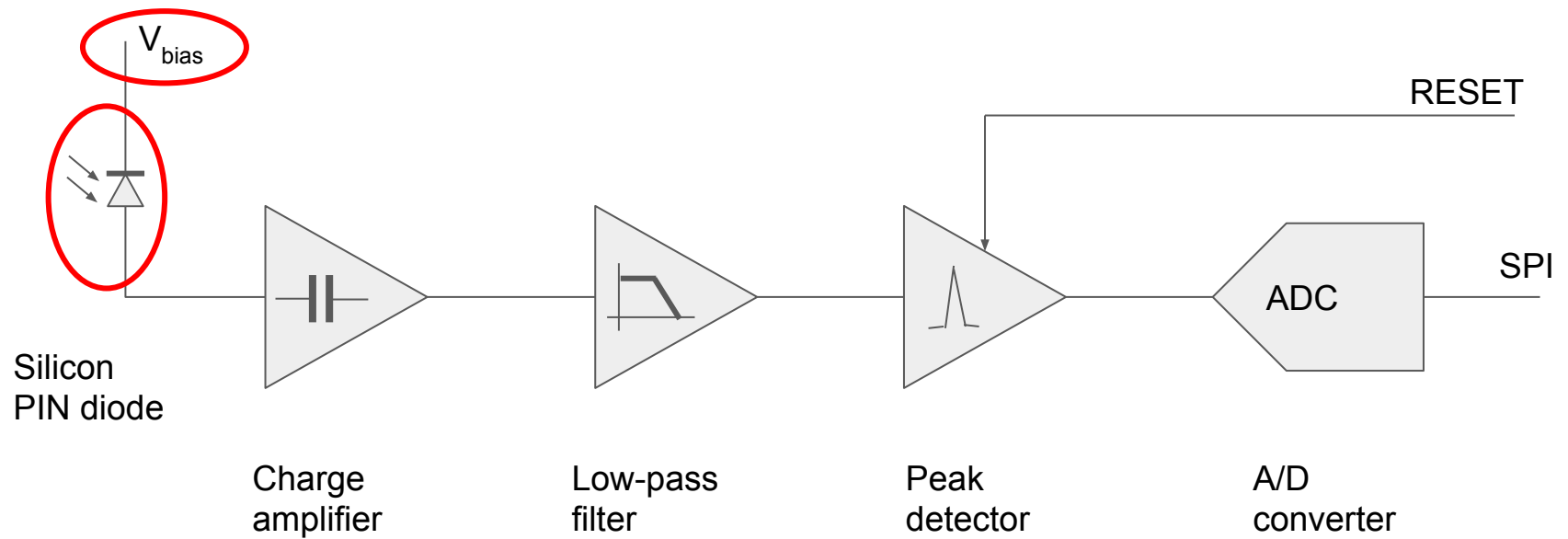
Comparison 3 Liulins in the one flight

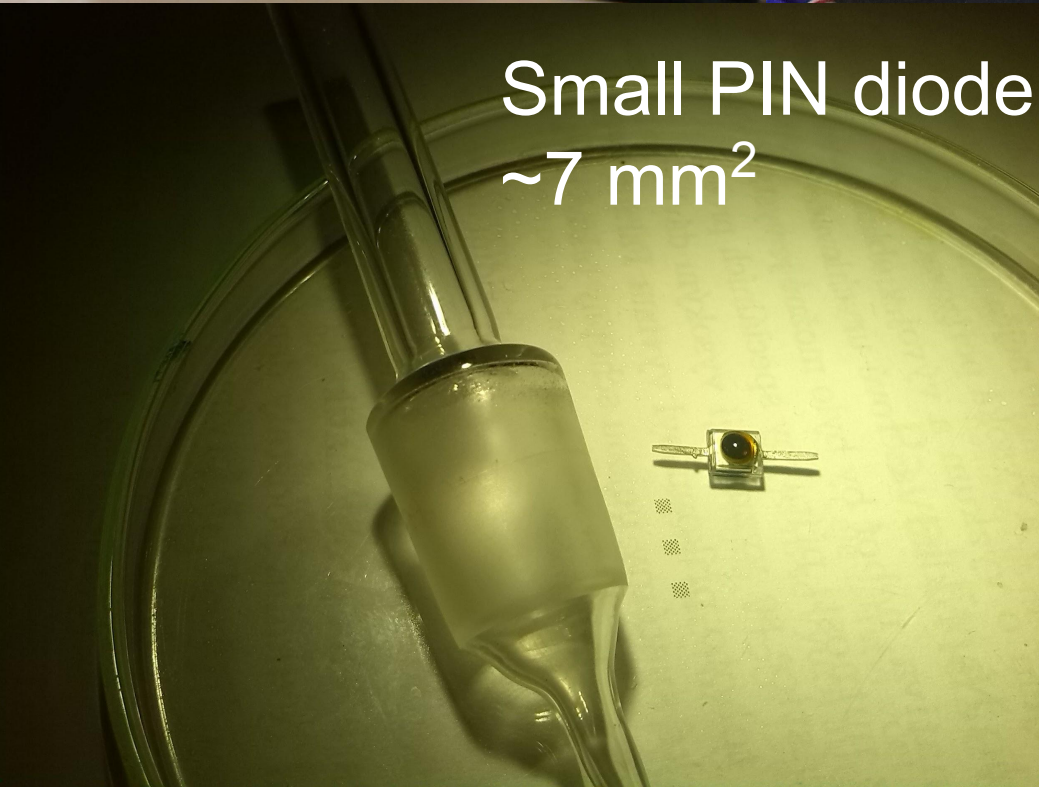
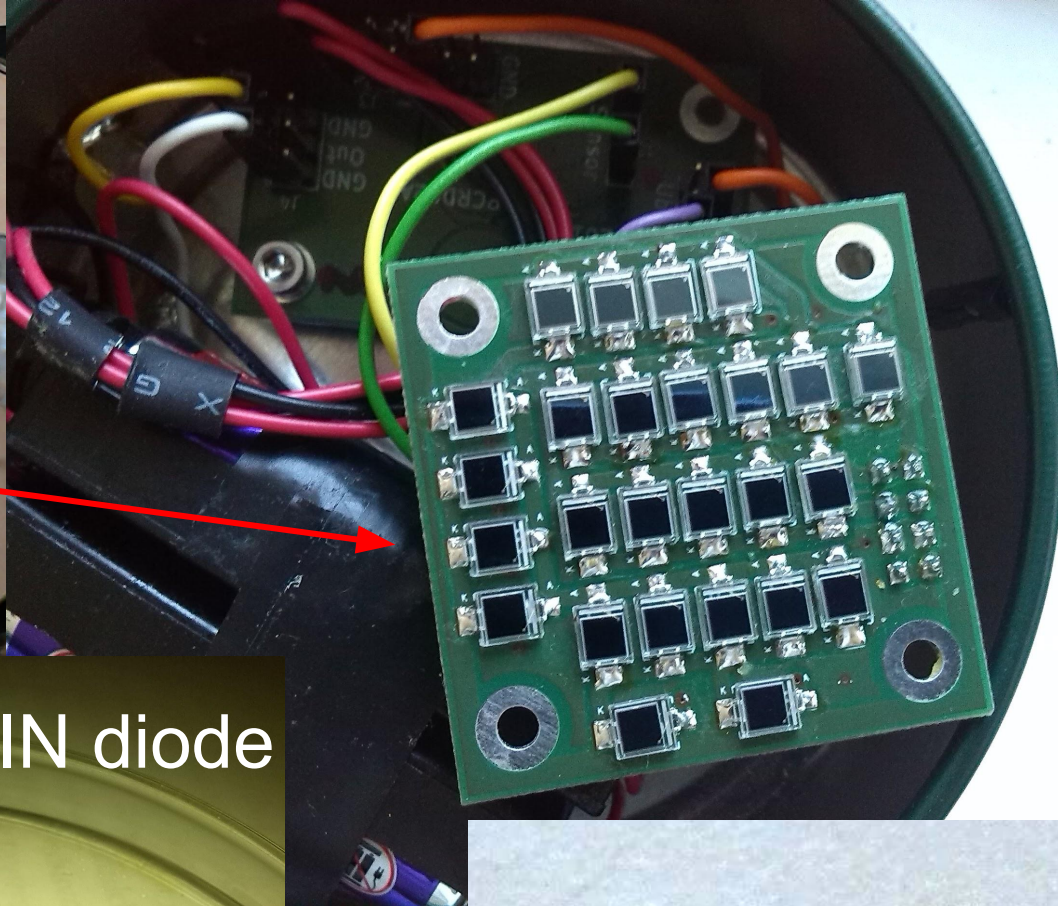
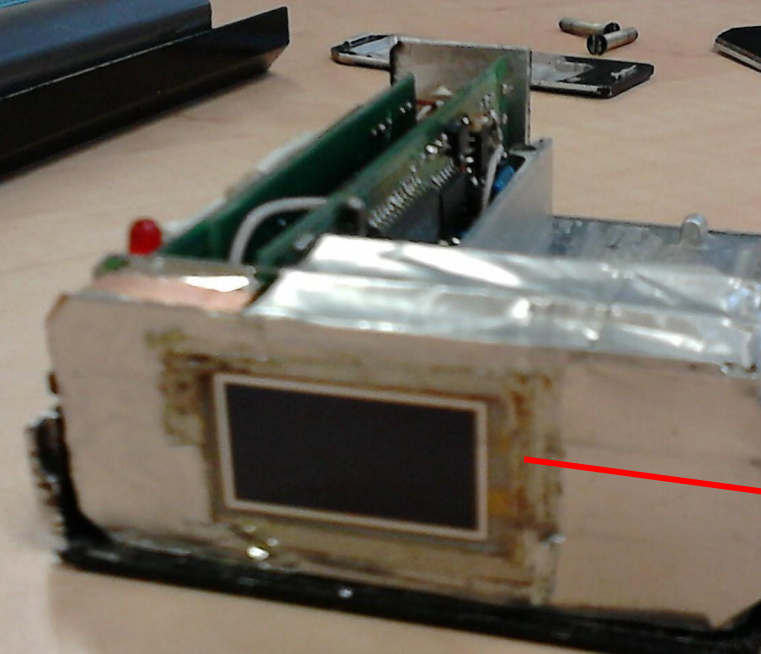


CANDY Silicon Detector



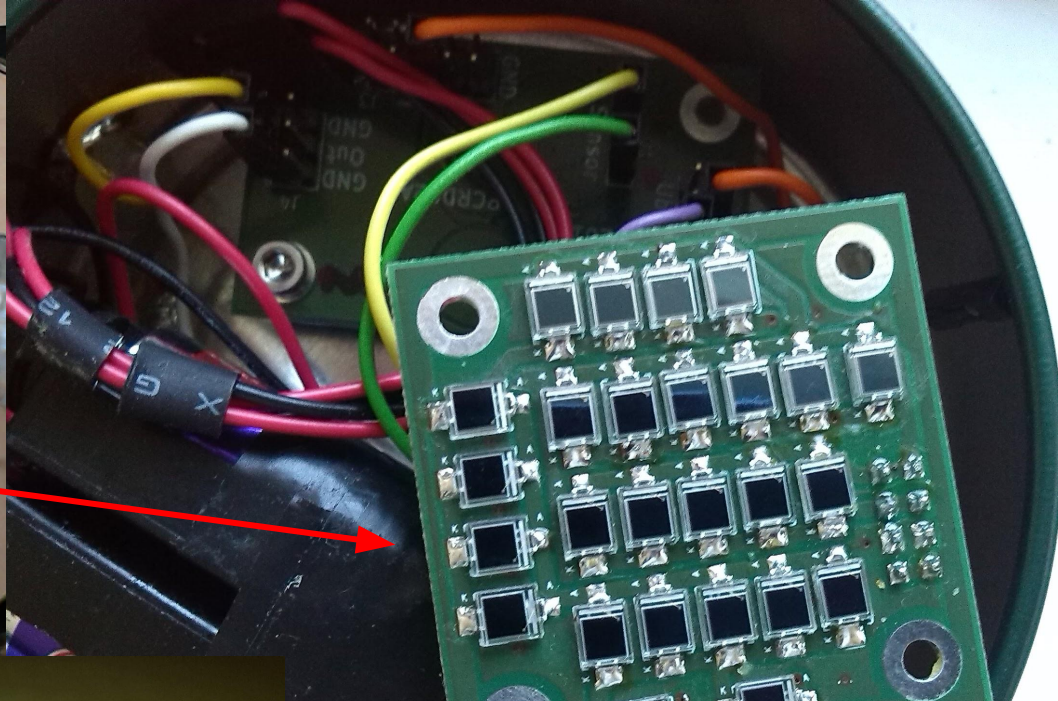
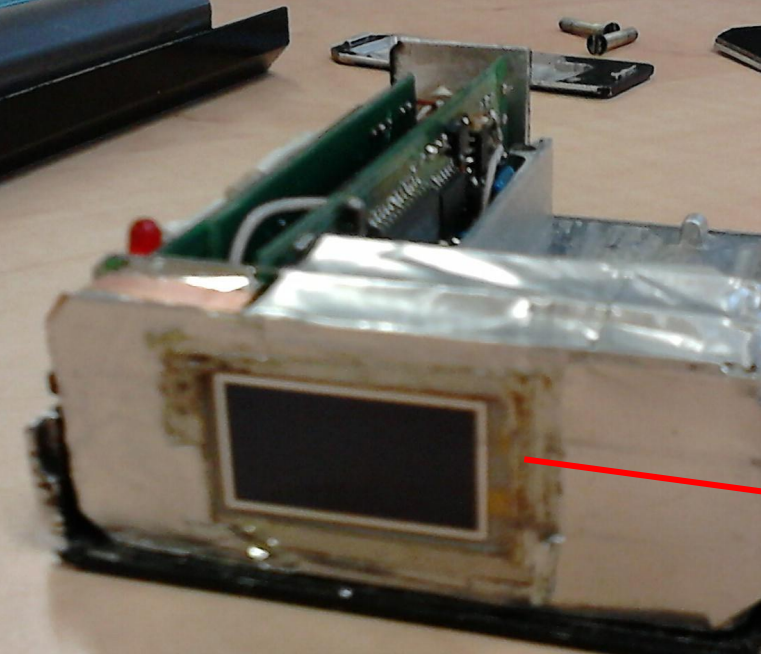
CANDY Silicon Detector





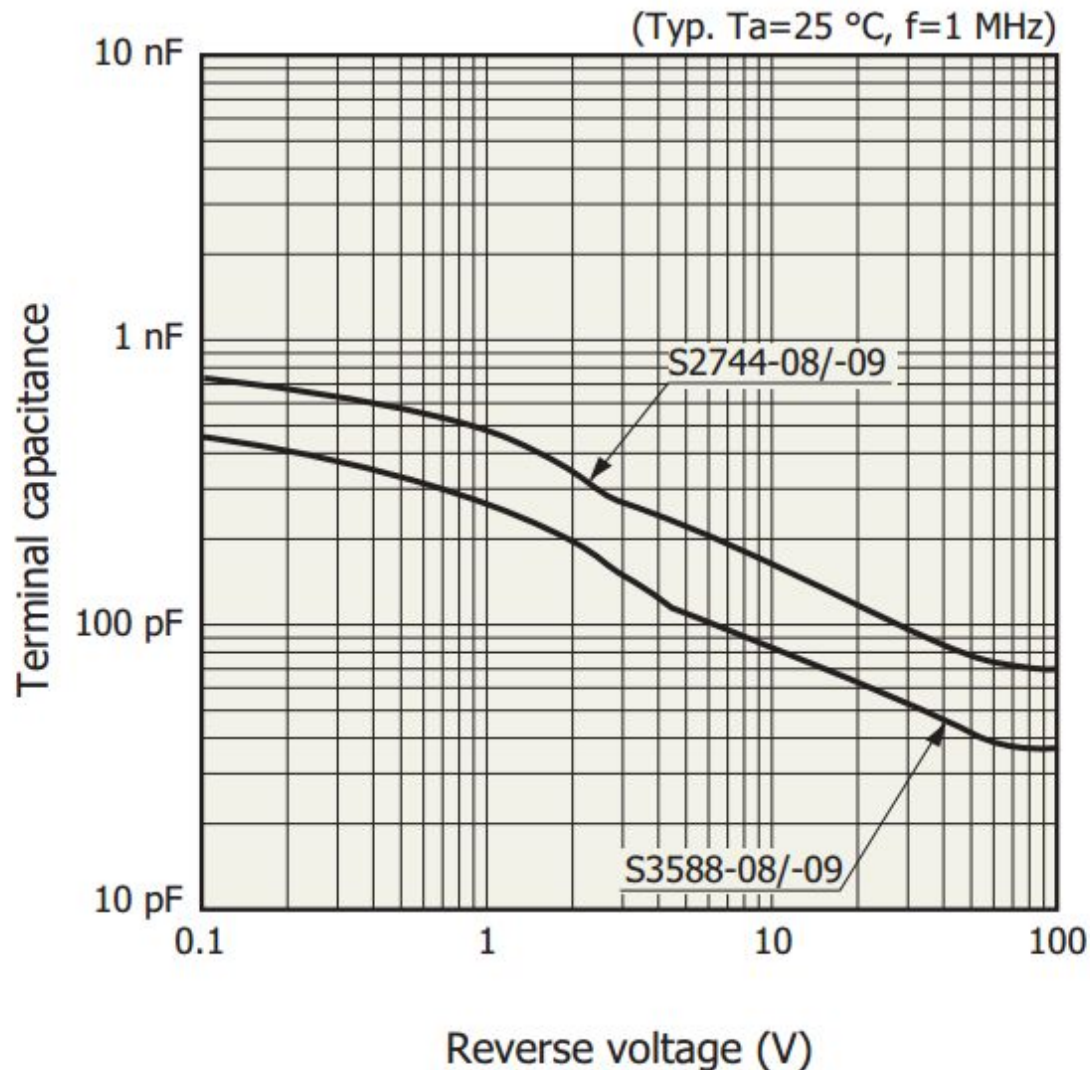
Small PIN diode
 $\sim 7 \text{ mm}^2$





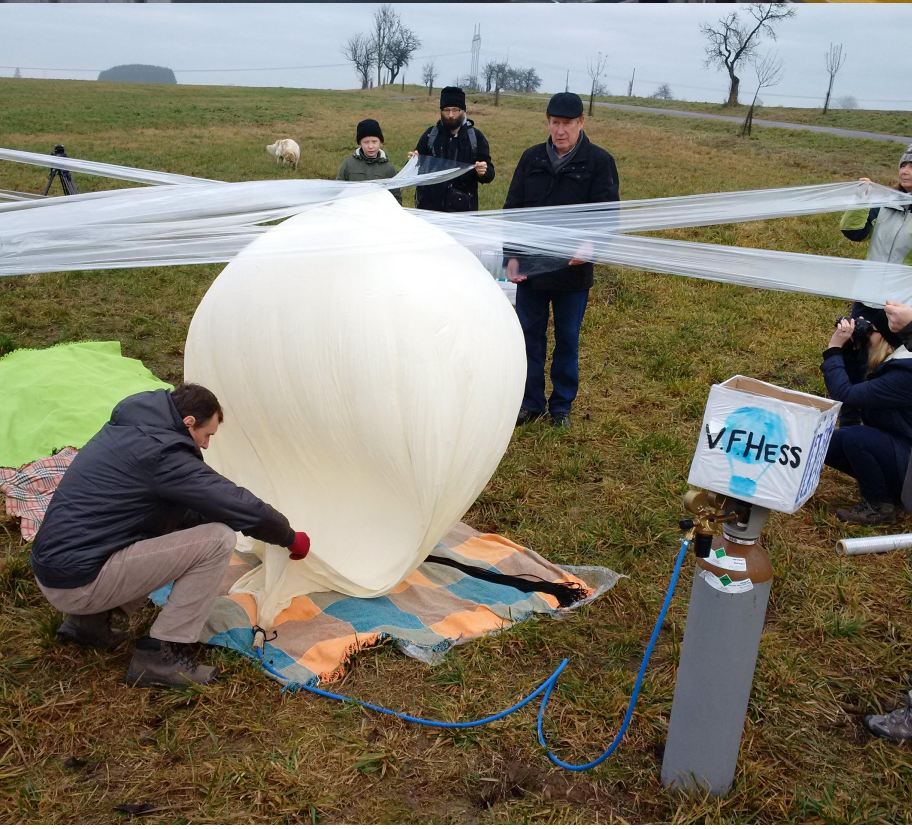
Hamamatsu PIN photodiode

❖ Terminal capacitance vs. reverse voltage

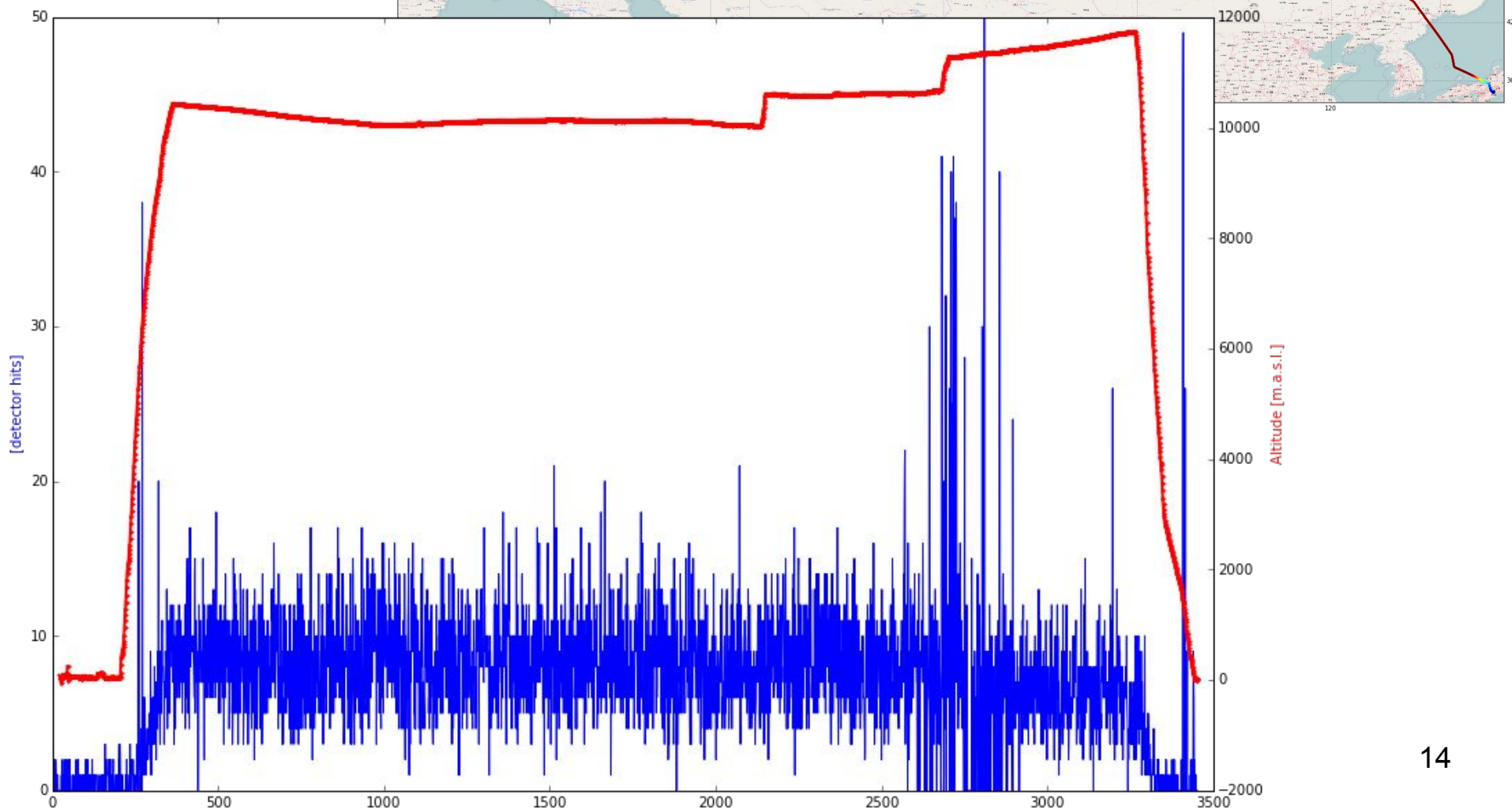


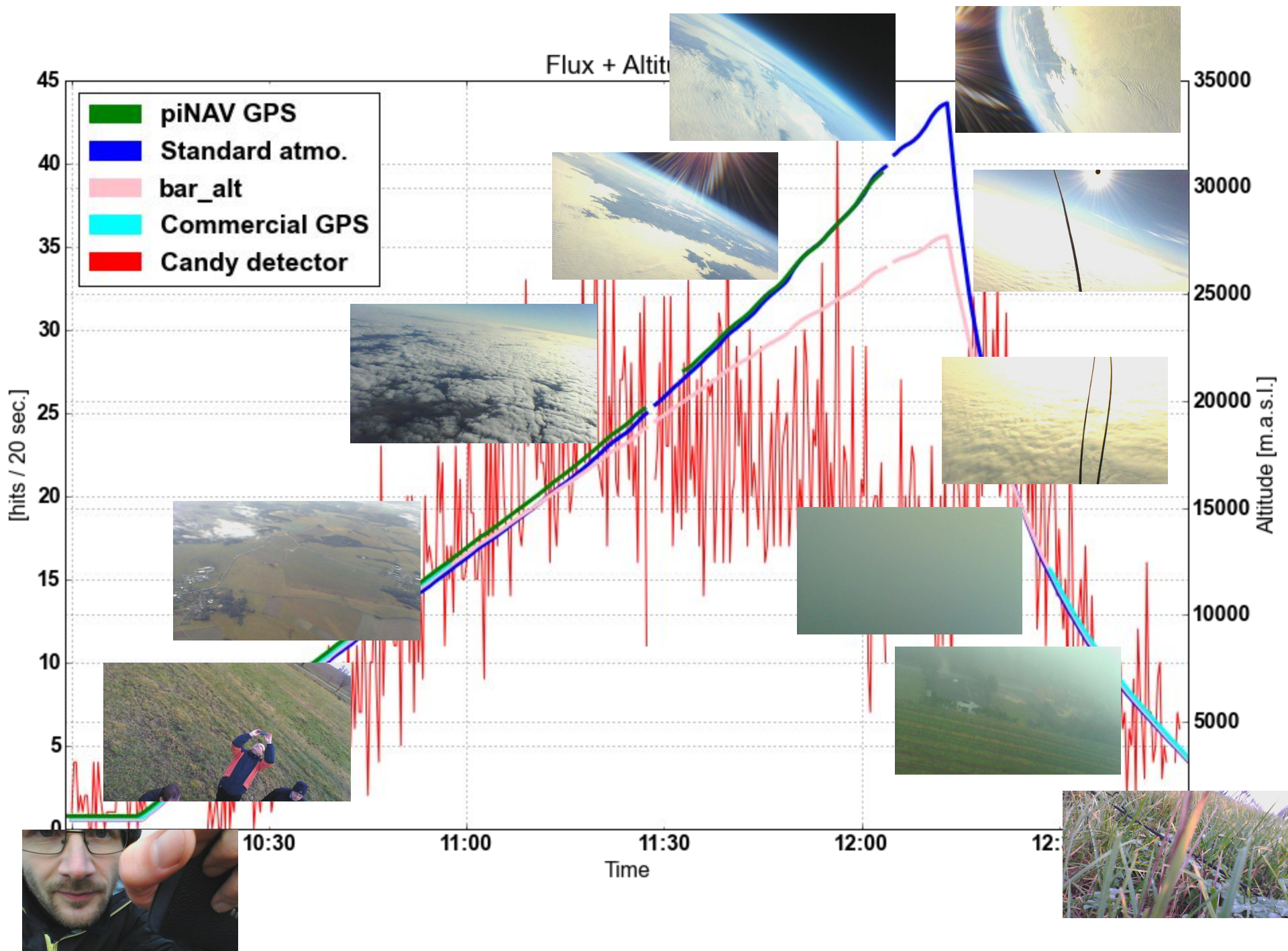
$$C = \epsilon_0 \epsilon_r \frac{S}{l}$$

Experiments

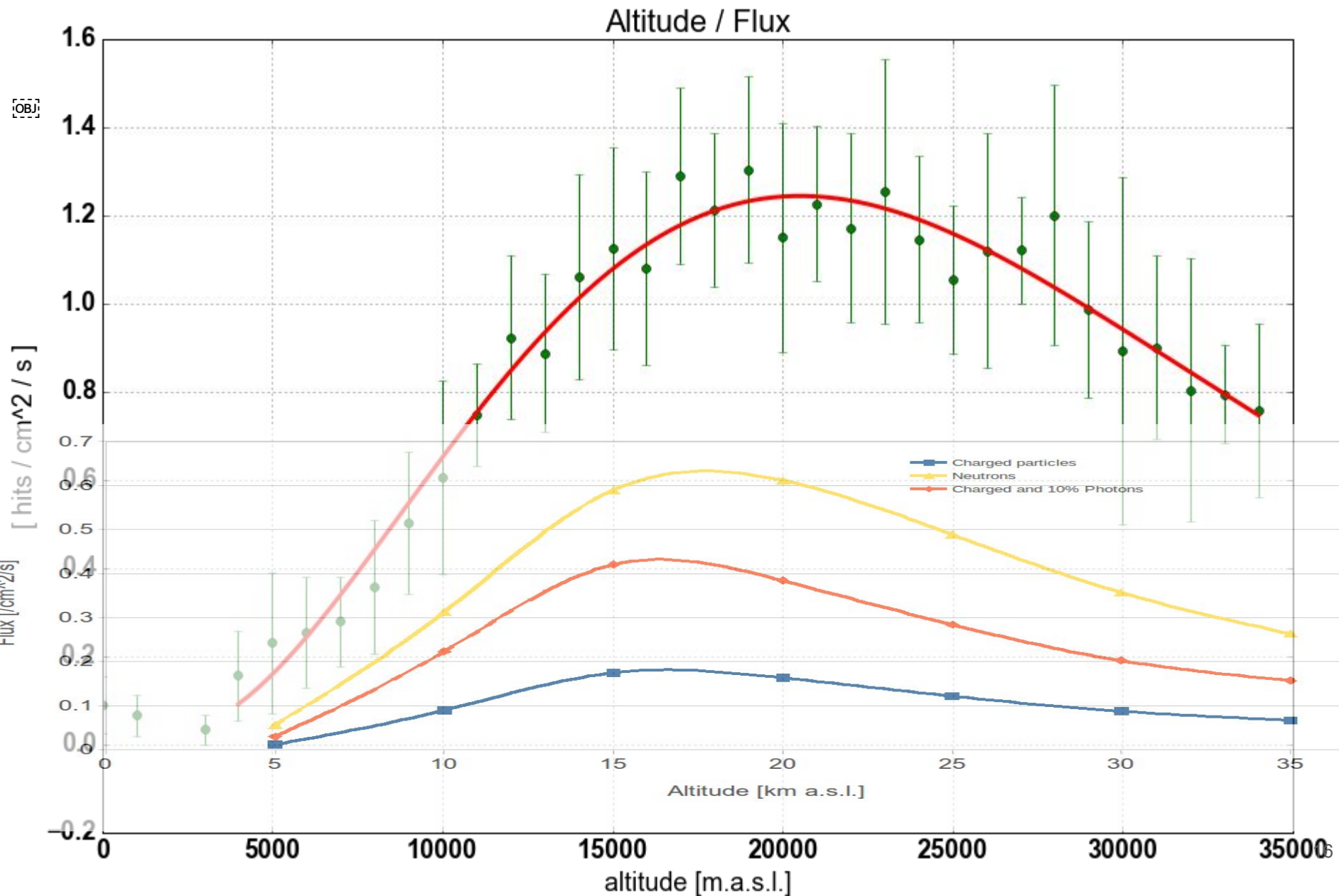


Mic Effect

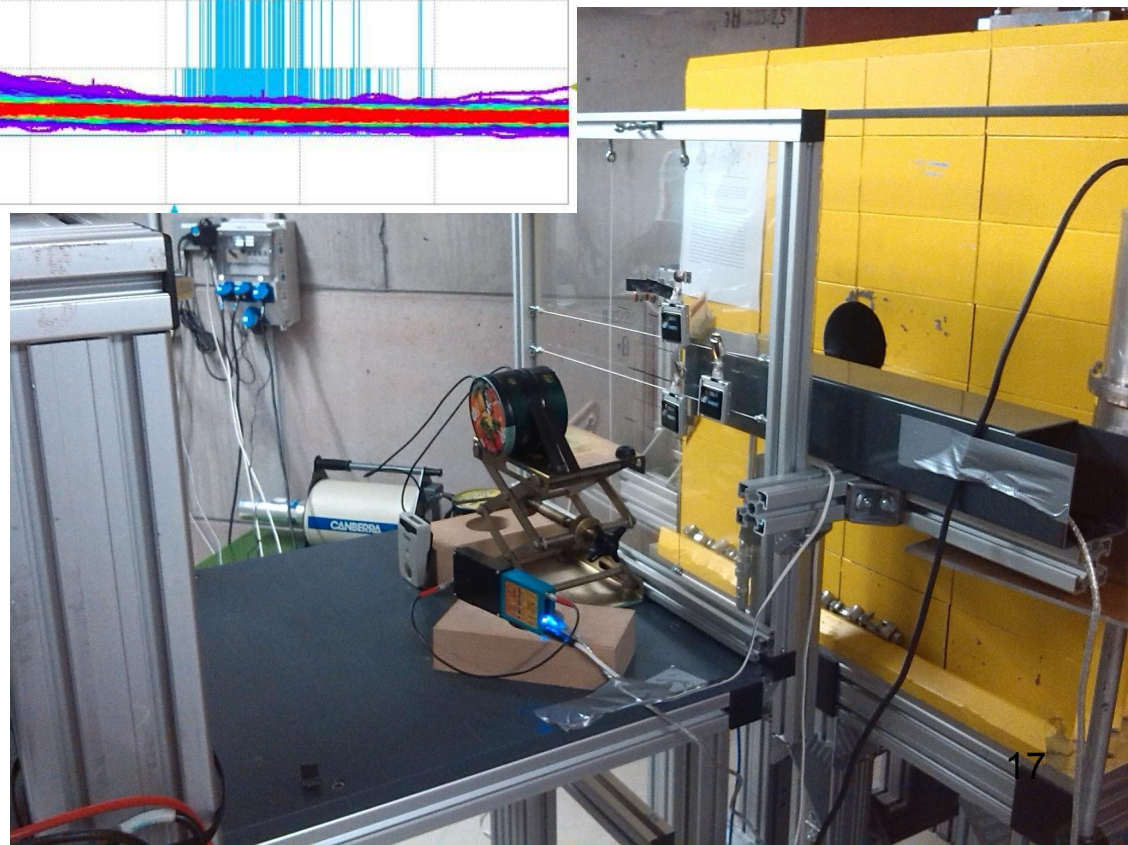
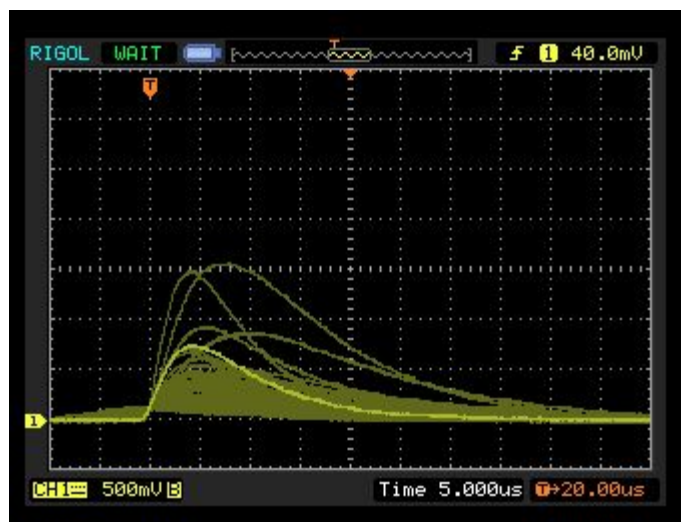
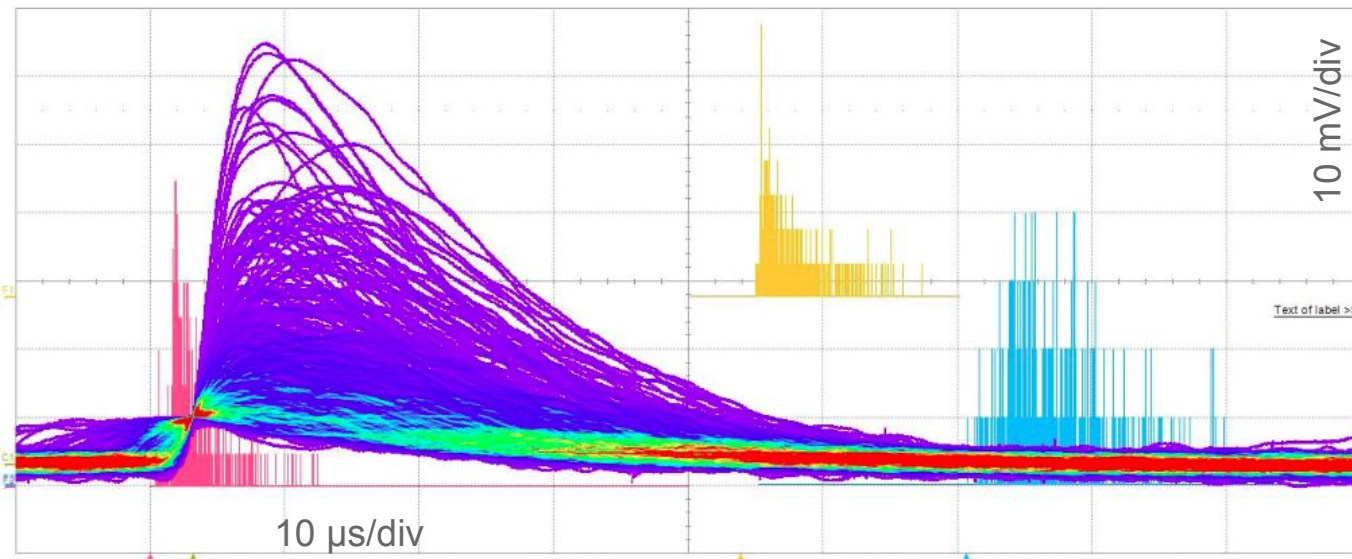




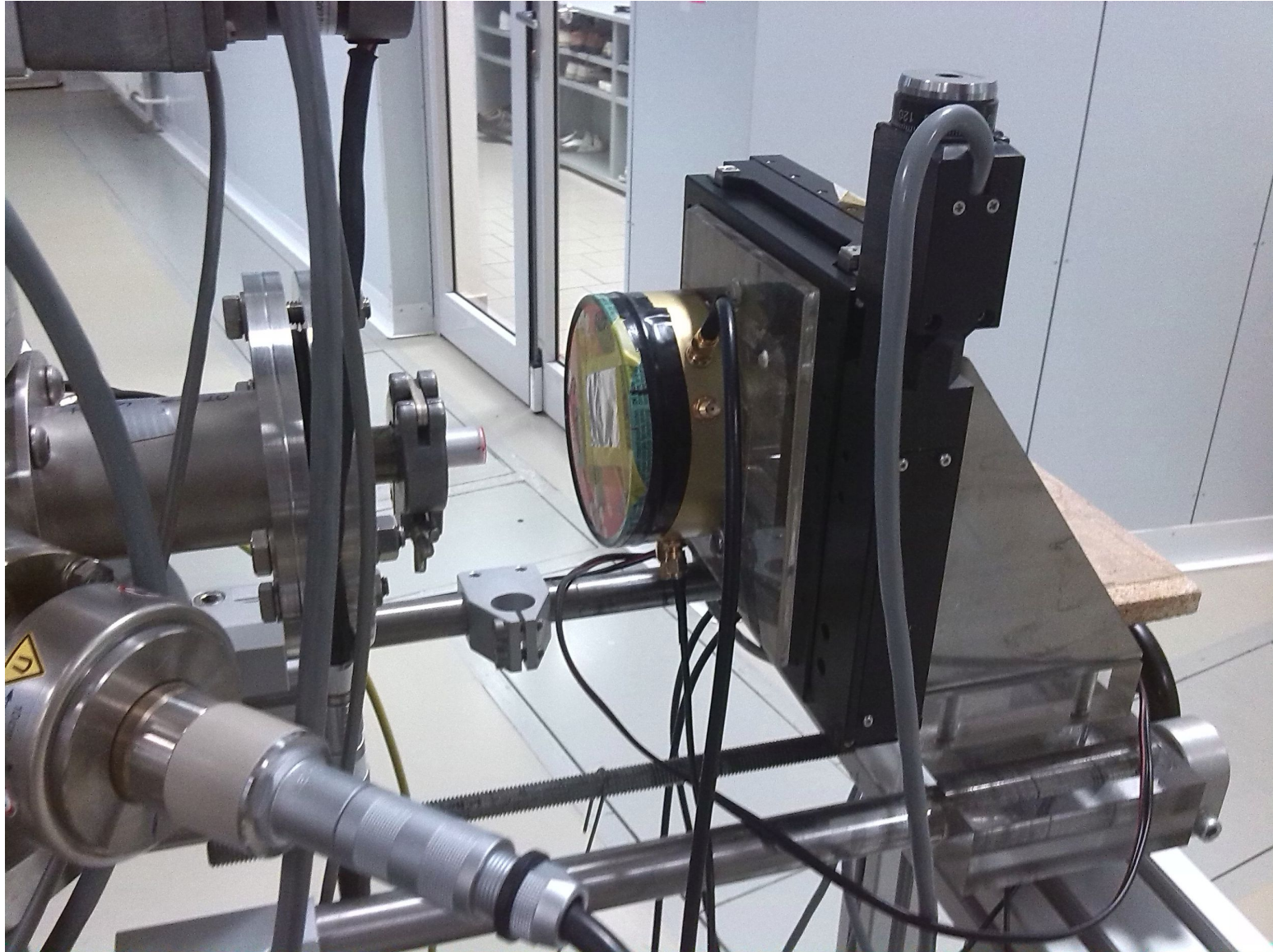
Pfotzer's maximum X EXPACS



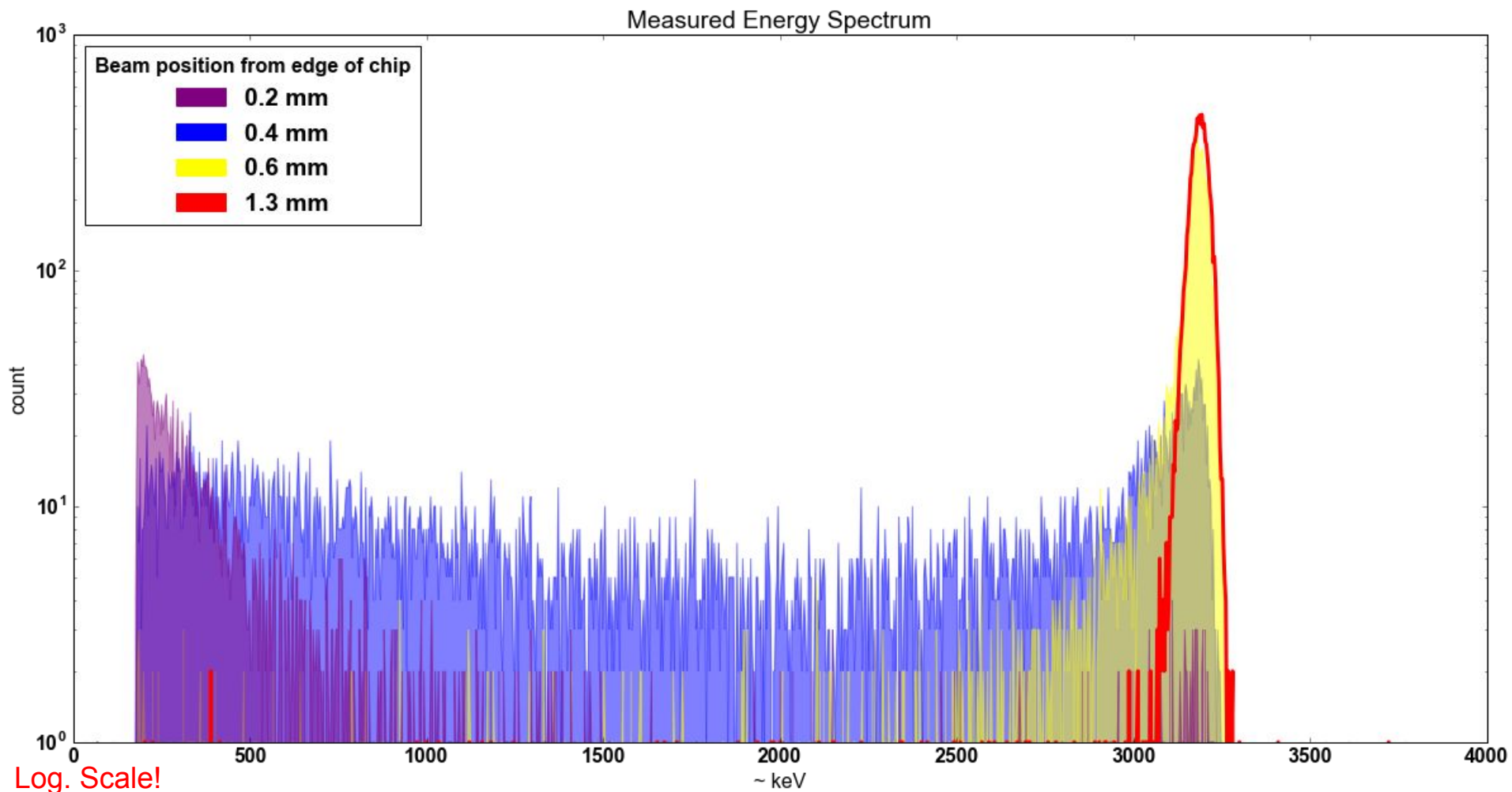
Ionisation Sources



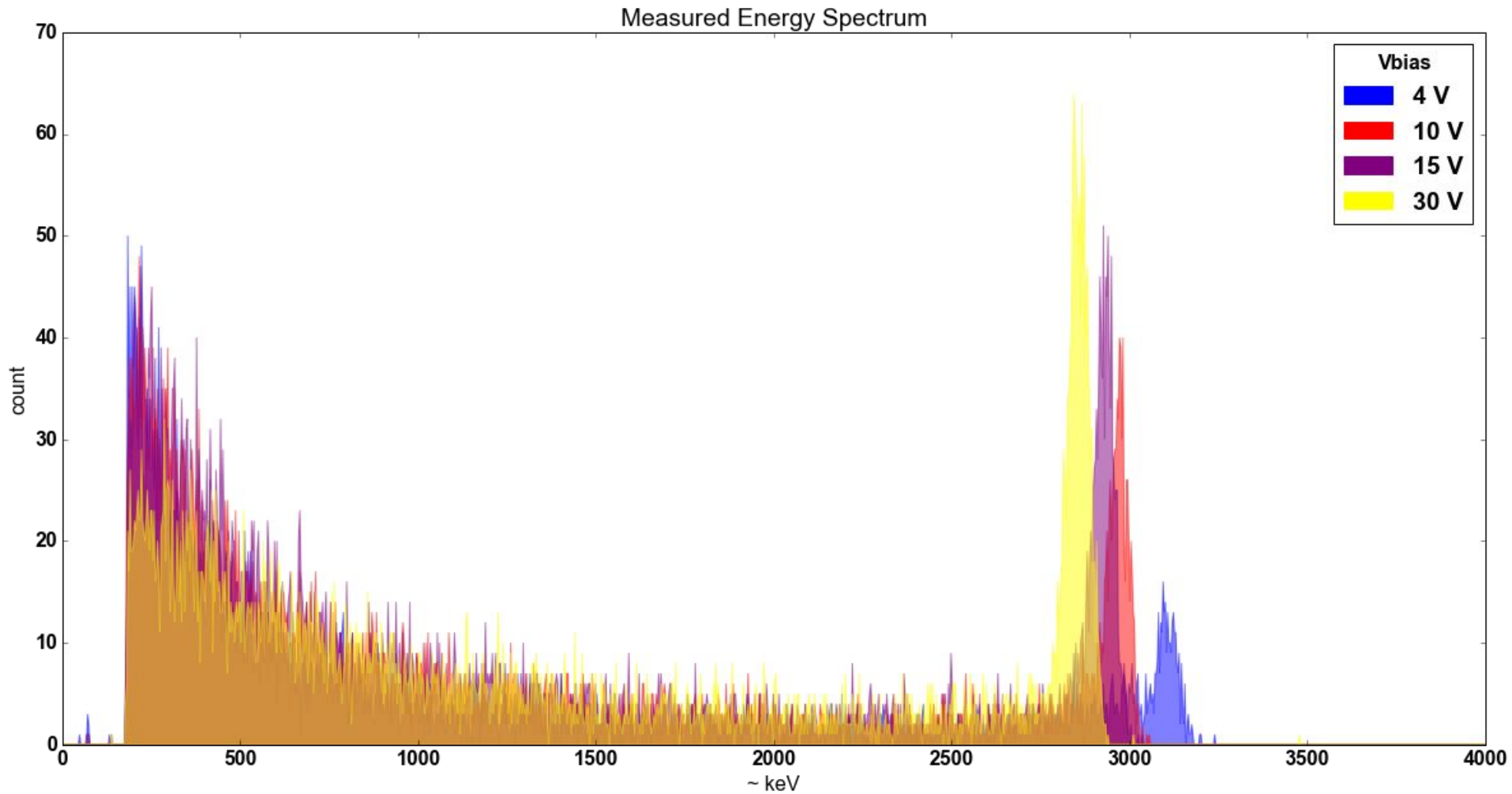
Proton beam microprobe, <0.5 mm in diameter, 3 MeV



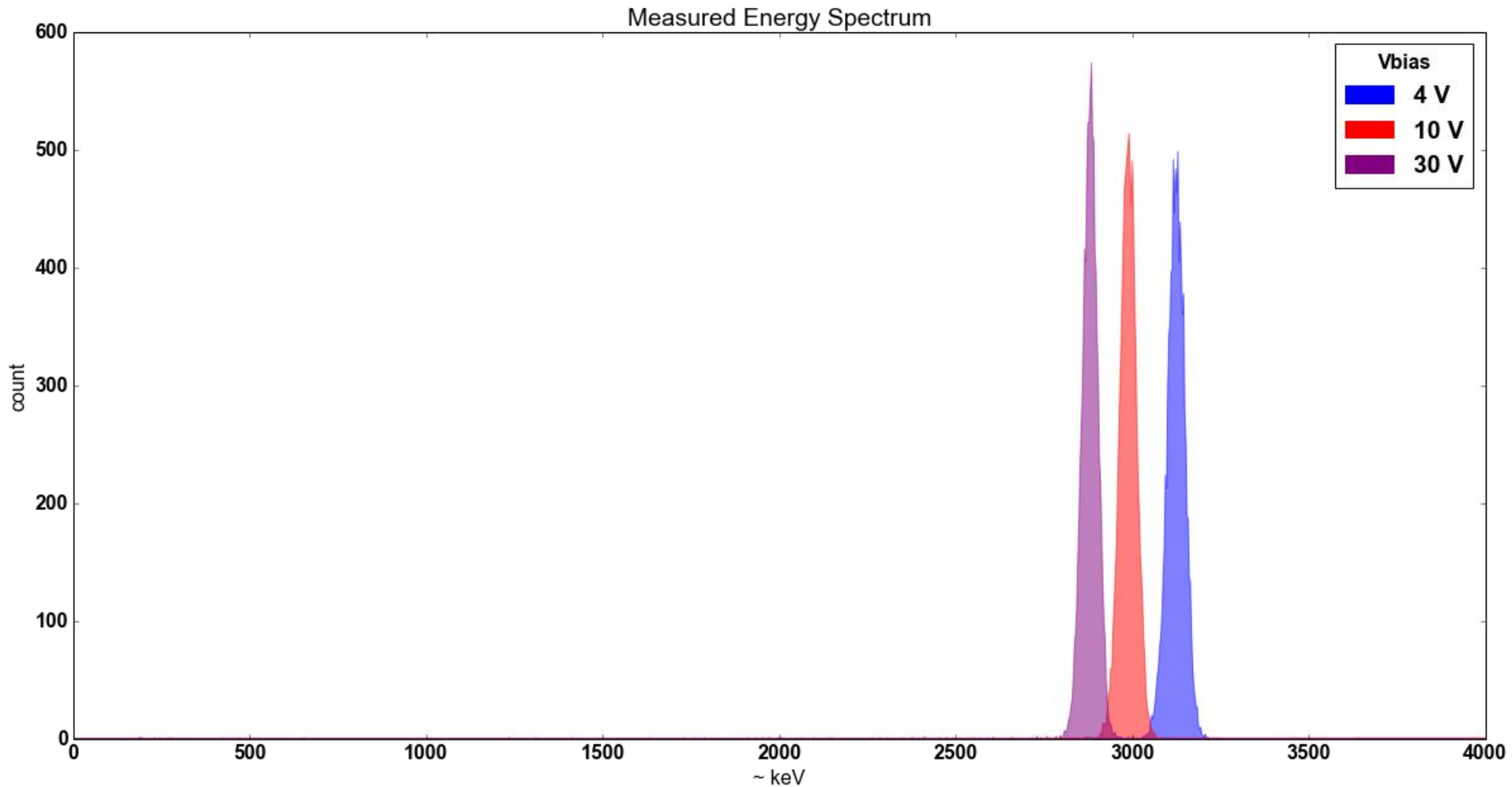
Spatial response, <0.5 mm dia., 3 MeV



V_{bias} Response at the edge of chip

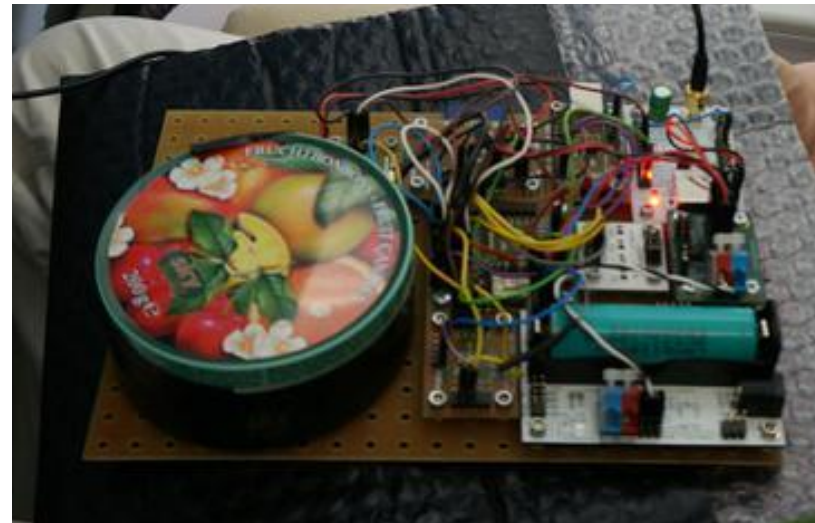
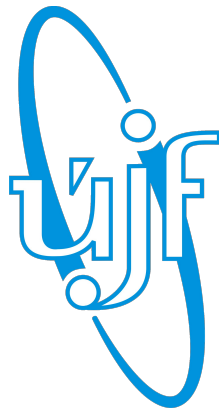
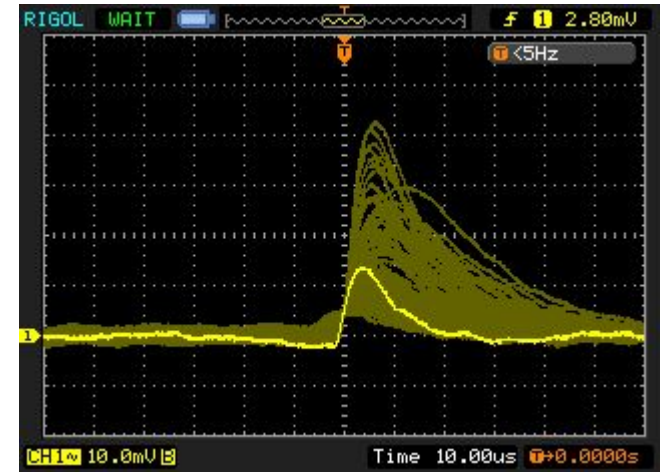


V_{bias} Response in center of chip



Consider our research

- Lightweight (Silicone detector)
- Low power consumption
- Low noise
- (Low cost)
- LET spectrometer



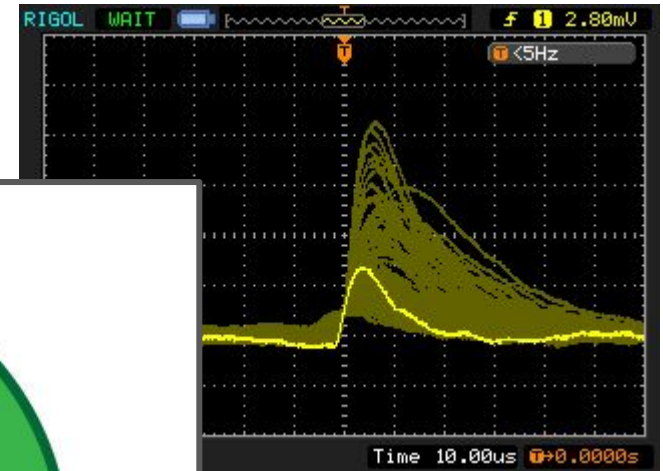
<http://www.mlab.cz/Modules/Sensors/PCRD02A/DOC/PCRD02A.cs.pdf>

Join our research

- Lightweight (Silicon)
- Low power consumption
- Low noise
- (Low cost)
- LET spectrometer



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