

First measurements of Nitrostrips detectors and irradiation status

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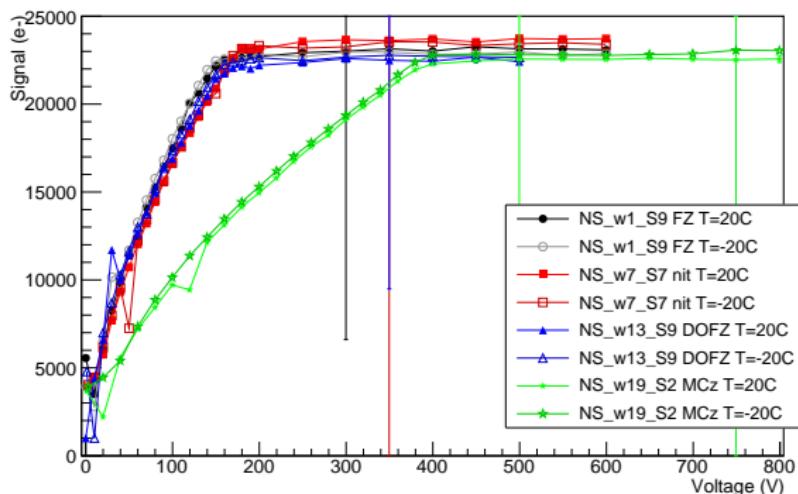
ETP

Measurements for NitroStrip

Measurements taken with the same ALiBaVa board and ^{90}Sr radioactive source

Trigger events 100000

NitroStrip ALiBaVa measurements



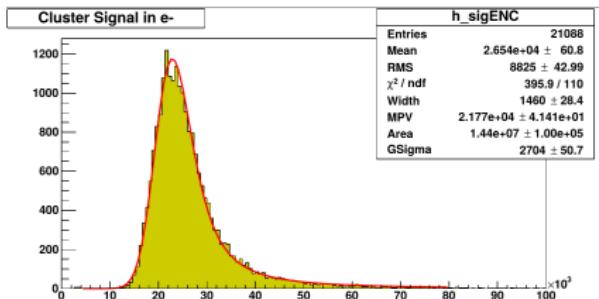
Once depleted, the detectors have:

- FZ $\sim 23\text{ke}^-$
- Nit $\sim 23.5\text{ke}^-$
- DOFZ $\sim 22.5\text{ke}^-$
- MCz $\sim 22.5\text{ke}^-$

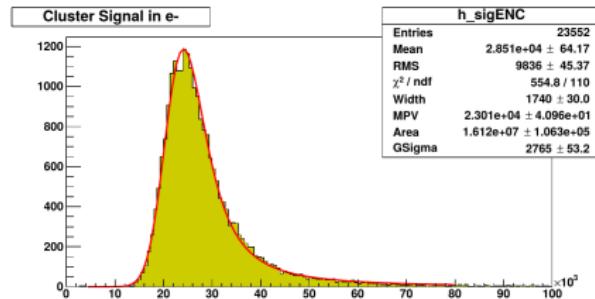
Measurements with trigger attenuation

Some measurements were taken with a silicon piece between the sensor and the scintillator. Measurements taken for the MCz wafer

With silicon piece



Without the silicon piece

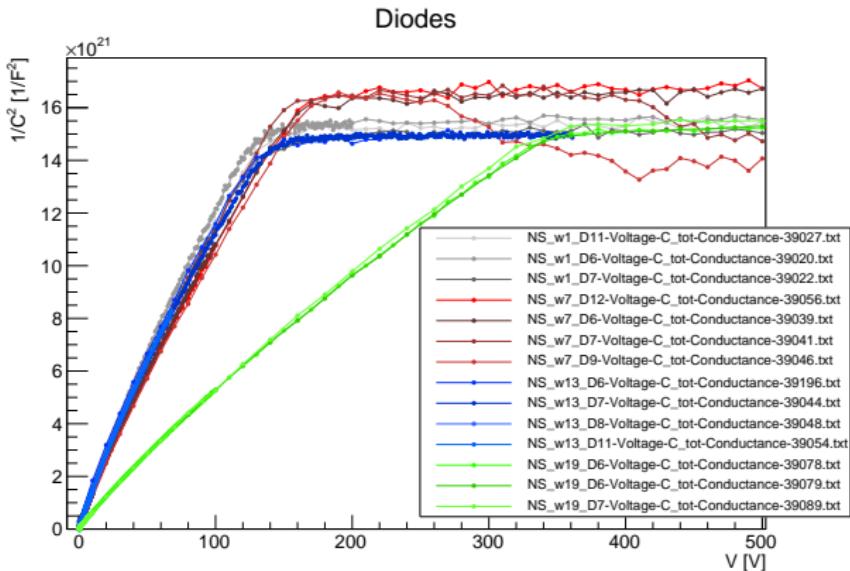


- MPV 21700 electrons

- MPV 23010 electrons

6% difference between the two measurements

CV for NitroStrip



- The depletion agrees with ALiBaVa measurements

Irradiations

Irradiation Neutrons Ljubljana Diodes

Fluence n_{eq}/cm^2	FZ	Nit	DOFZ	MCz	Measurement
$2 \cdot 10^{11}$	2	2	2		DLTS
$5 \cdot 10^{12}$	2	2	2		TSC
$1 \cdot 10^{13}$	2	2	2		TSC
$5 \cdot 10^{13}$	2	2	2		TSC
$1 \cdot 10^{14}$	2	2	2	2	
$3 \cdot 10^{14}$	2	2	2	2	
$6 \cdot 10^{14}$	2	2	2	2	
$1 \cdot 10^{15}$	2	2	2	2	

Irradiations

Irradiation Protons KIT Diodes

Fluence n_{eq}/cm^2	FZ	Nit	DOFZ	MCz	Measurement
$1 \cdot 10^{13}$	2	2	2		TSC
$5 \cdot 10^{13}$	2	2	2		TSC
$1 \cdot 10^{14}$	2+1	2+1	2+1	2+1	TSC
$3 \cdot 10^{14}$	2	2	2	2	
$6 \cdot 10^{14}$	2	2	2	2	
$1 \cdot 10^{15}$	2	2	2	2	

Irradiations

Irradiation Protons CERN
Diodes

Fluence n_{eq}/cm^2	FZ	Nit	DOFZ	MCz	Measurement
$5 \cdot 10^{12}$	2	2	2		TSC
$1 \cdot 10^{13}$	2	2	2		TSC
$5 \cdot 10^{13}$	2	2	2		TSC
$1 \cdot 10^{14}$	2	2	2	2	TSC
$3 \cdot 10^{14}$	2	2	2	2	
$6 \cdot 10^{14}$	2	2	2	2	
$1 \cdot 10^{15}$	2	2	2	2	

Irradiations

Irradiation Neutrons Ljubljana, Protons CERN, Protons KIT
Strips

Fluence n_{eq}/cm^2	FZ	Nit	DOFZ	MCz	Measurement
$1 \cdot 10^{14}$	2+1	2+1	2+1	2	E-TCT + ALiBaVa
$3 \cdot 10^{14}$	2	2	2	2	ALiBaVa
$6 \cdot 10^{14}$	2	2	2	2	ALiBaVa
$1 \cdot 10^{15}$	2+1	2+1	2+1	2	E-TCT + ALiBaVa

- Strips and diodes neutron irradiated, to be measured by Freiburg?
- Strips and diodes protons irradiated at KIT, to be measured by KIT
- Diodes and strip protons irradiated at CERN, to be measured by Hamburg + e-TCT, DLTS, TSC?

Future work

- The sensors are ready for irradiation, next month is expected to irradiate with neutrons, protons (KIT and CERN). Two AIDA applications are filled and the KIT one is accepted.
- Strips will be measured with ALiBaVa setups at $-20\text{ }^{\circ}\text{C}$
- How to measure the diodes?
 - IV + CV (CV at 450 Hz/ 455 Hz and 1 kHz) at $-20\text{ }^{\circ}\text{C}$
 - Arrhenius plot for some diodes
 - with different annealings (see next slide)
- CERN (Matteo) is interested in some measurements?

Annealing steps

Annealing steps

Step number	Time [min]	Temperature [°C]
0	0	0
1	20	60
2	20	60
3	40	60
4	76	60
5	15	80
6	30	80
7	60	80