

Al Deposition on APD

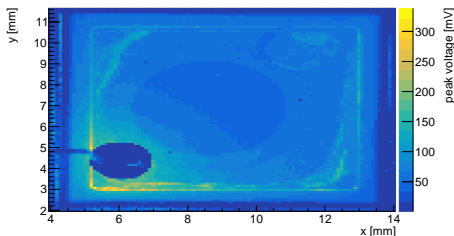
CERN SSD group

01.08.2017
APD meeting

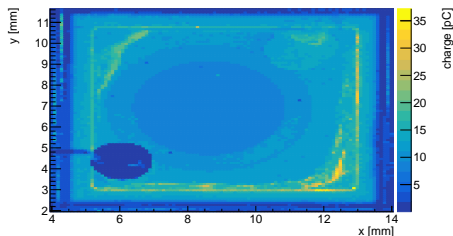


REMINDER $8 \times 8 \text{ mm}^2$ APD, Electrode Resistivity

Amplitude

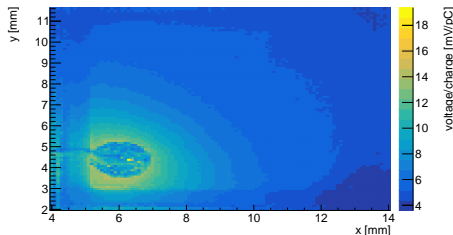


Charge in 25 ns



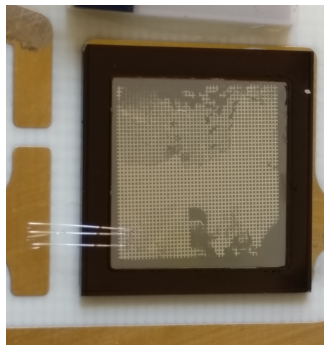
- IR front, 1700 V, -20°C
- Features of background in both charge and amplitude
- Take ratio
→ remove charge influence on amplitude

Amplitude / charge

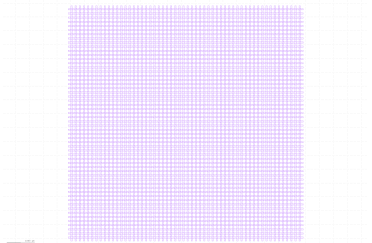


Al Deposition

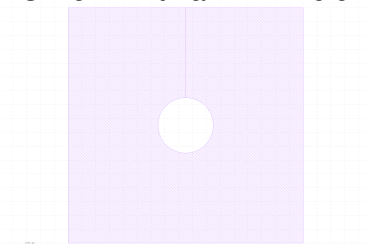
- Improve uniformity
- Clean room at EPFL
- Photolithographic process and sputtering
- Process to be optimized
- Al structured for laser tests



n-side
Grid: 50 μm stripes, 100 μm space



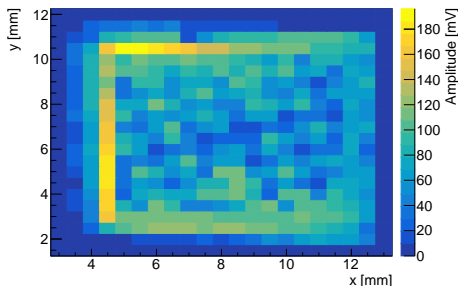
p-side
Uniform with a 2 mm hole



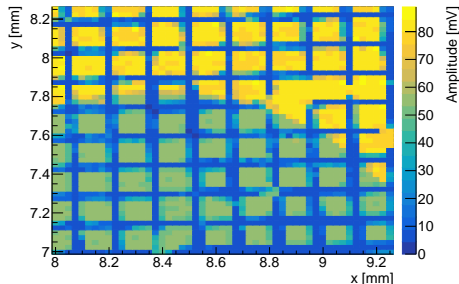
IR Laser measurements

Peak amplitude, 1800 V, 20 C, illumination from n-side

Coarse scan (out of focus)



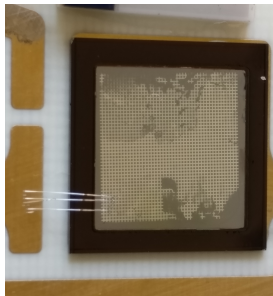
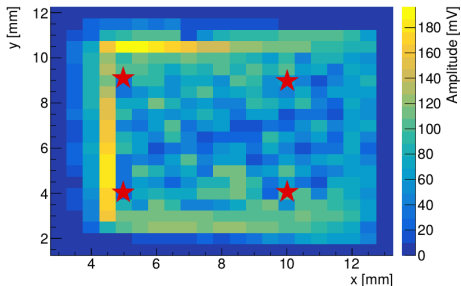
Fine scan



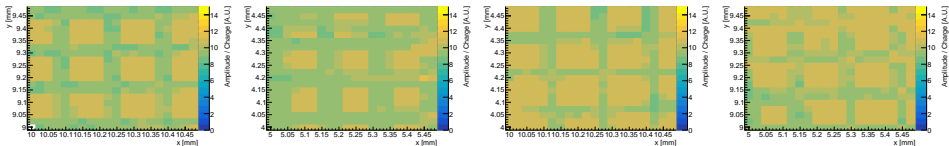
- Grid on n-side (lower amplitude)
- Continuous metal on p-side (higher amplitude)

Uniformity of response

1800 V, 20 C, illumination from n-side

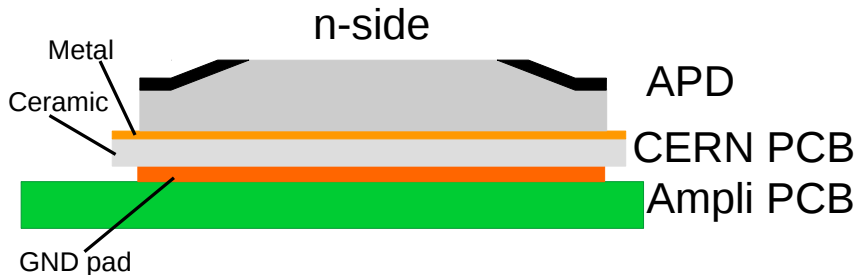
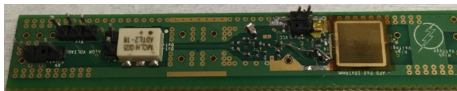


Ratio between charge and amplitude



Good uniformity over the detector

Integration with Penn Amplifier Board



Use a piece of the PCB used in CERN to isolate the p-side from the ground pad and provide electrical contact to the p-side.

CERN PCB thickness: 0.8 mm

Backup Material