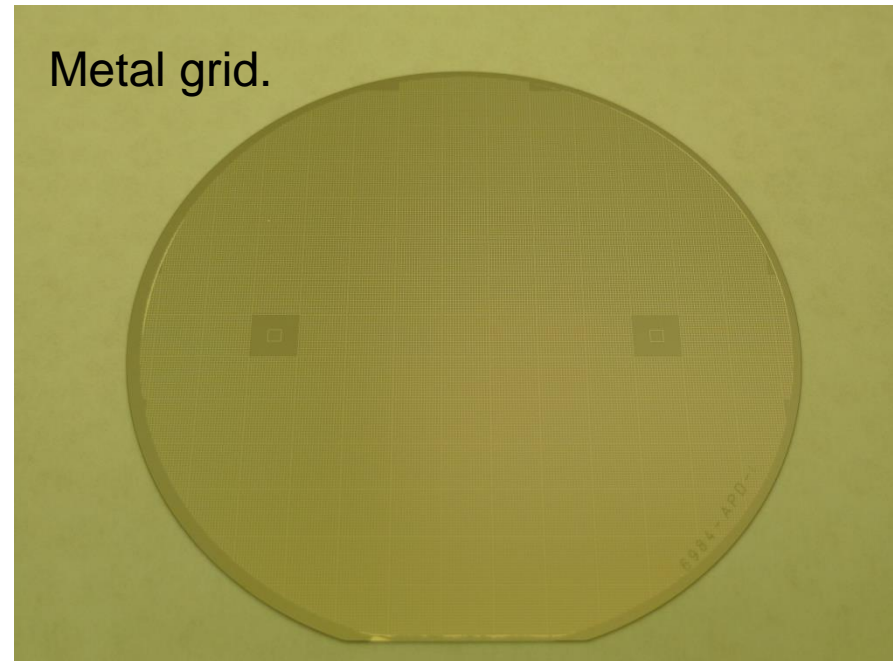
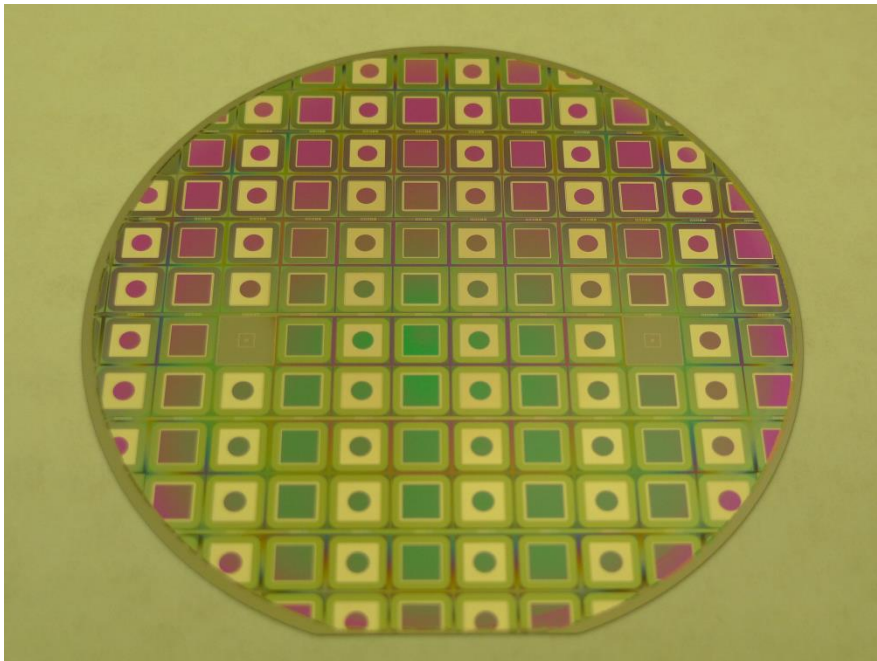


Discussion on LGAD and other detectors with Avalanche

Giulio Pellegrini

New fabrication run

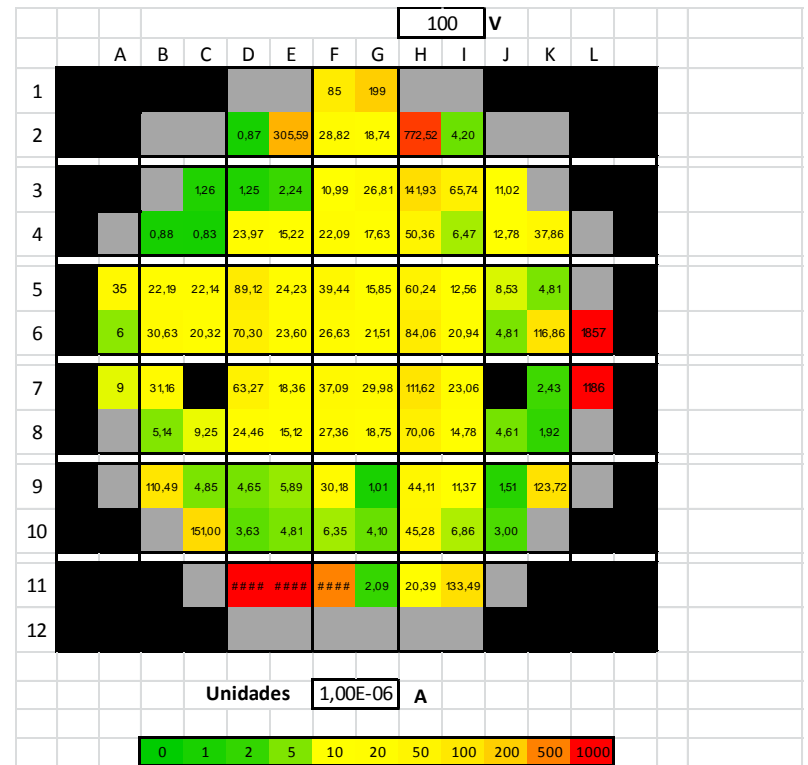
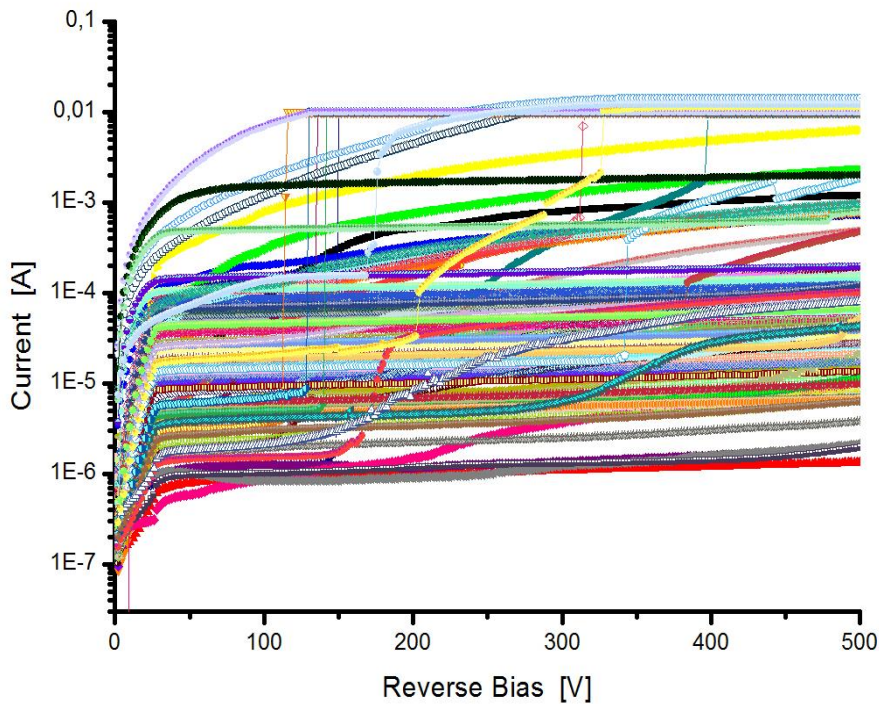
- N-P Diodes, FZ 300um thick wafers.
- No guard ring structure.
- 8 wafers processed, 3 different p-implants.



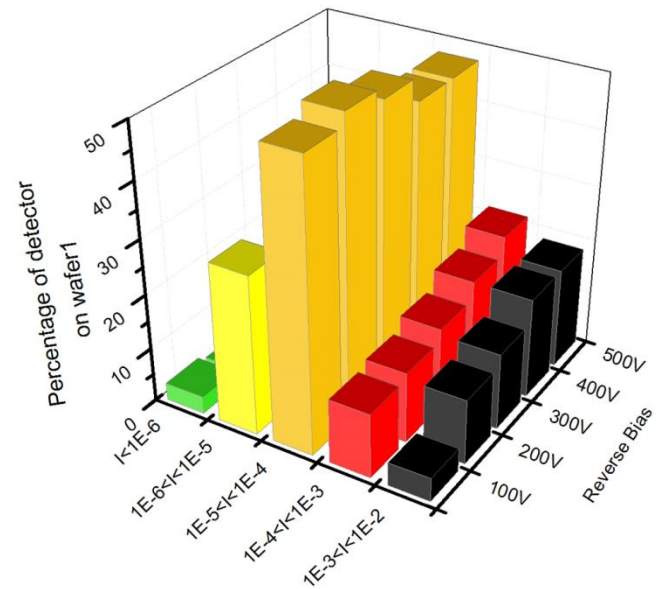
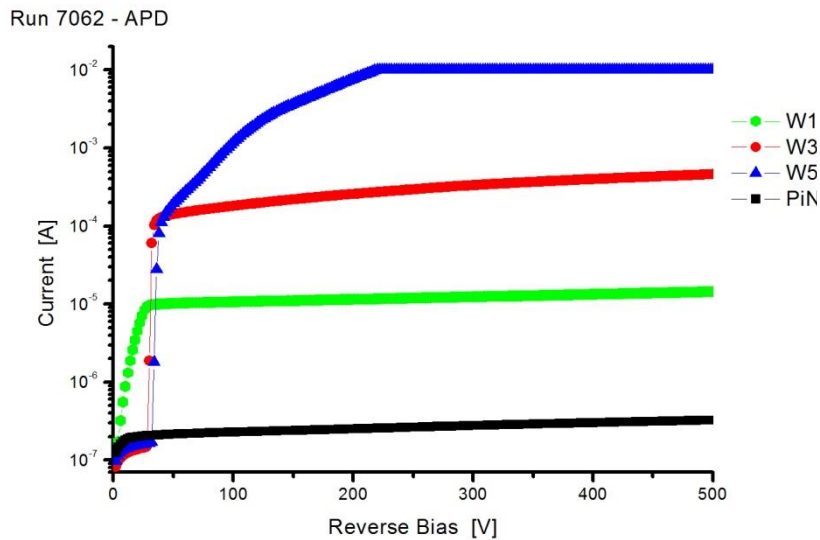
Wafer current mapping

Run 7062 APD

Wafer 1 - All devices (93)



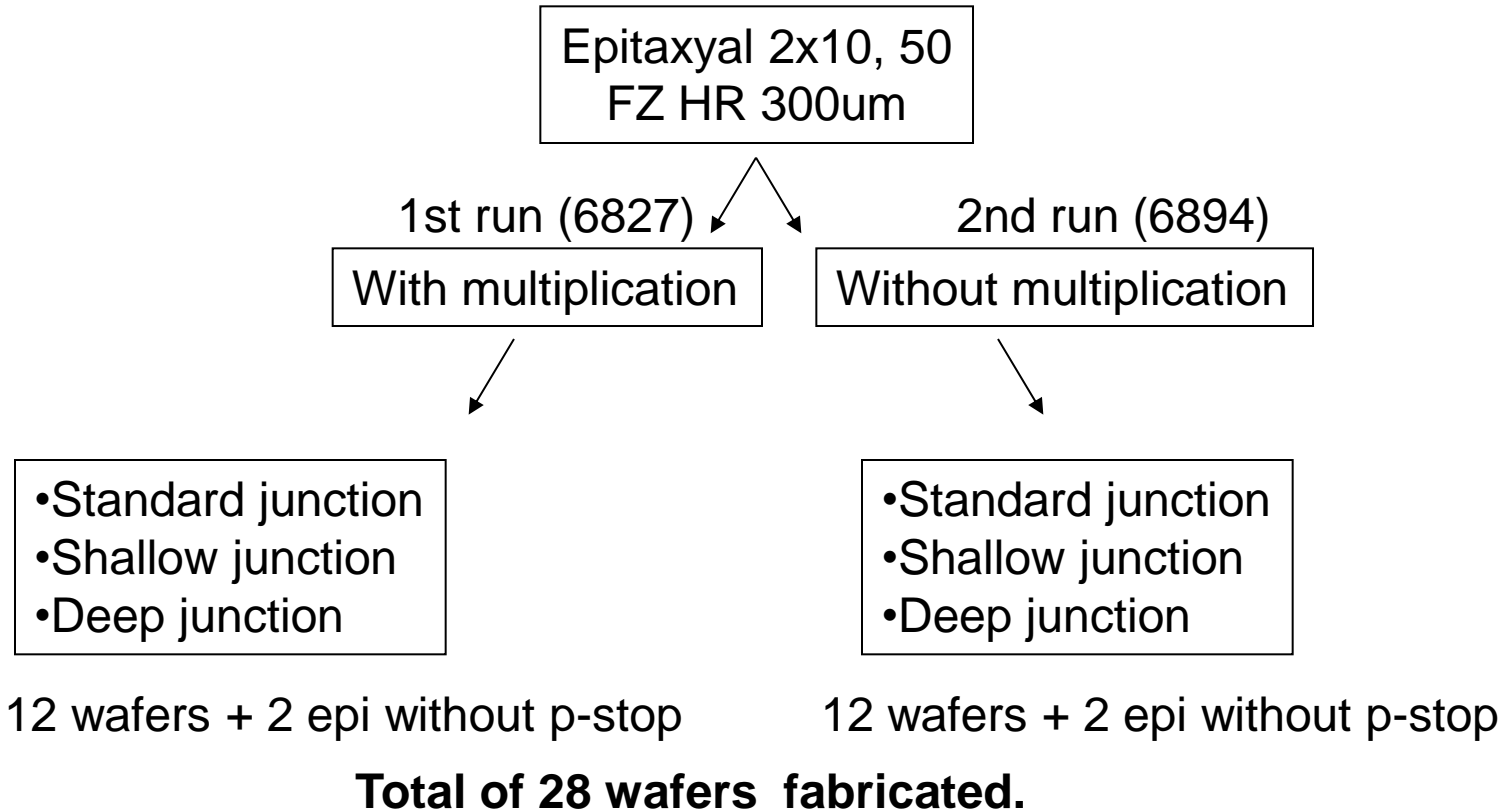
I-V comparison



Wafer 1

Wafers with different p+ implant doses.
Breakdown higher than 1000V.

Wafers



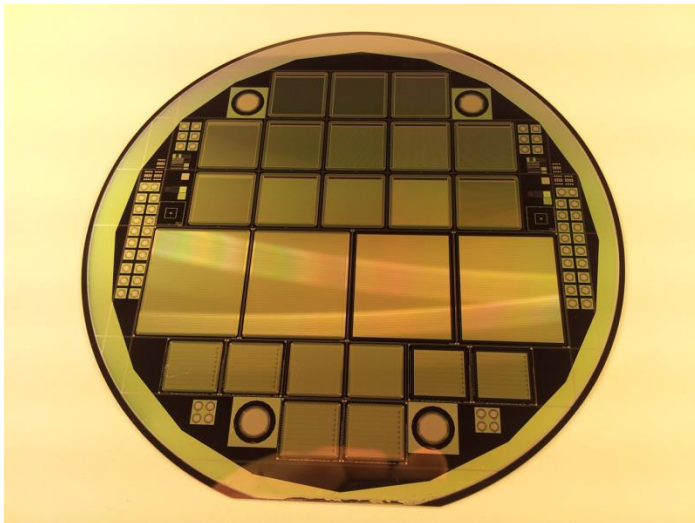
- Epylayer: 100 mm / 525 mum/B/ 0.006 ohm·cm <100>:
 - 9.8 mum/110.5 ohmcm,
 - 50.4mum/96.7 ohmcm
 - 75.2mum/104.6ohmcm
- FZ: p-type, 285um, <100>, 12k±7k ohm·cm.

Irradiations?

- Neutron irradiations done in Ljubljana.
- Proton irradiation still missing.
- Understanding of multiplication decreasing with fluence.
- In my opinion we should try to do a complete irradiation campaign at low and high fluences.

Summary of available wafers

- Wafers 2,8,11,13 with multi. diced and strips under testing at Santa Cruz.
- Fe-i4 and FE-I3 pixels from wafer 13 sent to Selex for In bonding.
- Wafers 8 and 13 without multiplication diced and at CNM.
- 8 Wafers (4,6,10 and 14) of each type ready to be sent to IZM for UBM deposition and flip chip . Institute contributing: CNM,IFAE, IFCA,USC, Glasgow.



Wafer		Implantation			
#	Type	P stop	Multiplication	Drive in	Type
		Dosis-E	Dosis-E		
1	Epi 10um	Yes	-	-	Shallow
2	Epi 10um	Yes	-	-	Shallow
3	Epi 10um	None	-	-	Standard
4	Epi 10um	Yes	-	-	Standard
5	Epi 50um	Yes	-	-	Shallow
6	Epi 50um	Yes	-	-	Standard
7	Epi 50um	None	-	-	Standard
8	Epi 50um	yes	-	-	Deep
9	Epi 75um	Yes	-	-	Shallow
10	Epi 75um	Yes	-	-	Standard
11	Epi 75um	Yes	-	-	Deep
12	FZ	Yes	-	-	Shallow
13	FZ	Yes	-	-	Standard
14	FZ	yes	-	-	Deep

New RD50 funding request

Title of project: Fabrication of 200um thick p and n- type pad detectors with enhanced multiplication effect.

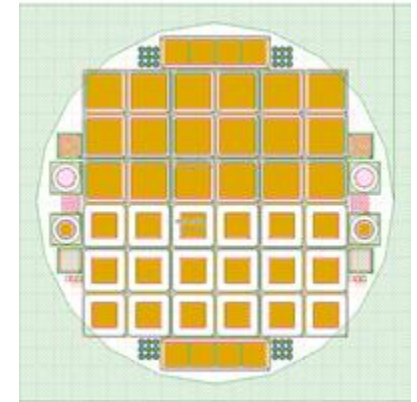
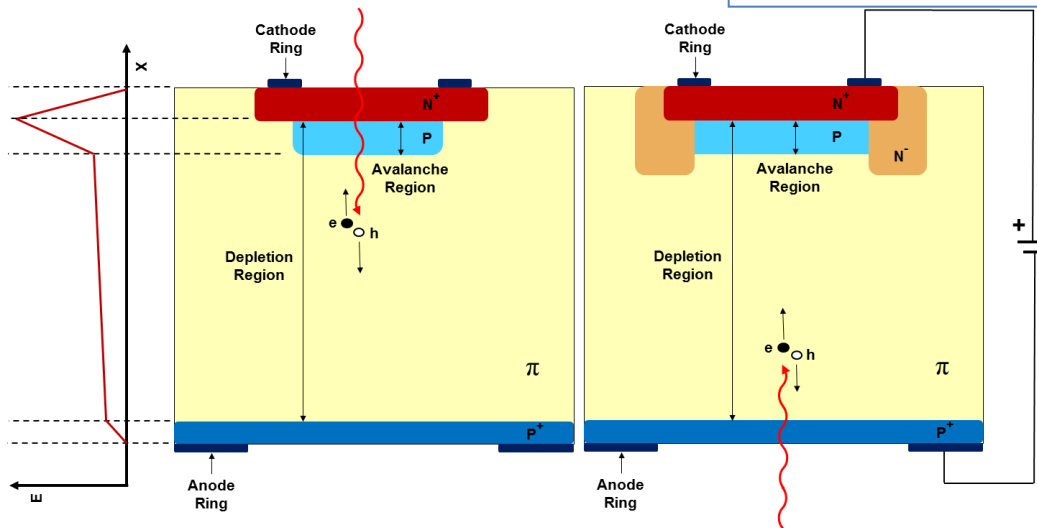
Request to RD50:

10.000€ (12.500 CHF)

Total project cost:

20.000 € (25.000CHF)

n-type wafers => h^+ multiplication
p-type wafers => e^- multiplication



This fabrication run will be also used to understand and to improve the yield of the first two fabrication runs of diodes with multiplication.

- Pixel detectors applications
- Future linear collider

Summary of talks

- Strip detectors, Micron dedicated run:
 - C. Betancourt, S. Wonsak.
- First run with CNM diodes LGAD:
 - M.Fernandez, H. Sadrozinski, G. Kramberger
- First run with CNM strip, pixel LGAD detectors:
 - M. Baselga.
- New fabrication run LGAD CNM diodes.
 - G. Pellegrini