Nuovi rivelatori (n,cp / ƒ / ɣ)..?

f	*γ*	*cp*
PPFC	C6D6	micromegas
micromegas	TAC	Silici
PPAC		
Silici		

f	*γ*	*cp*
PPFC	C6D6	micromegas
micromegas	TAC	**Silici**
PPAC		
Silici		

Un possibile caso fisico

$^{16}O(n,\alpha)^{13}C$: 3 – 15 MeV

- Problemi con il set-up basato su target gassoso e camera a ionizzazione

Si potrebbe pensare ad una misura basata su di un target solido e rivelatori al silicio

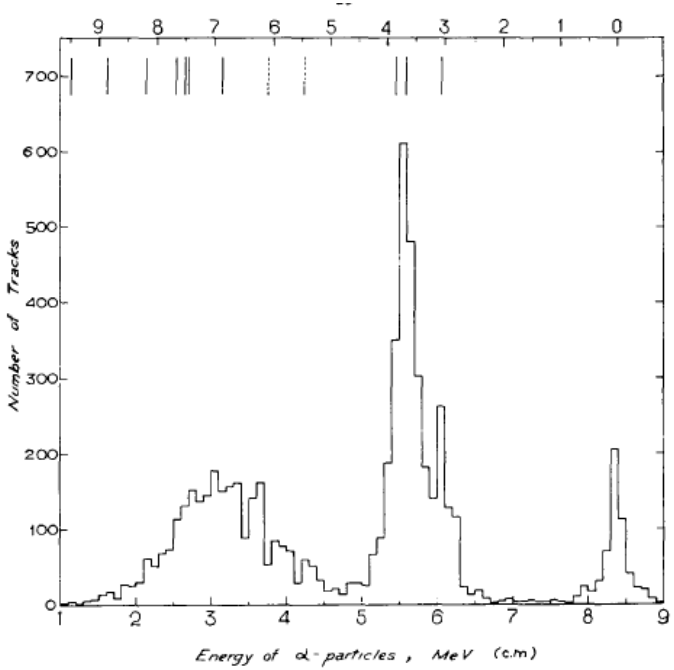
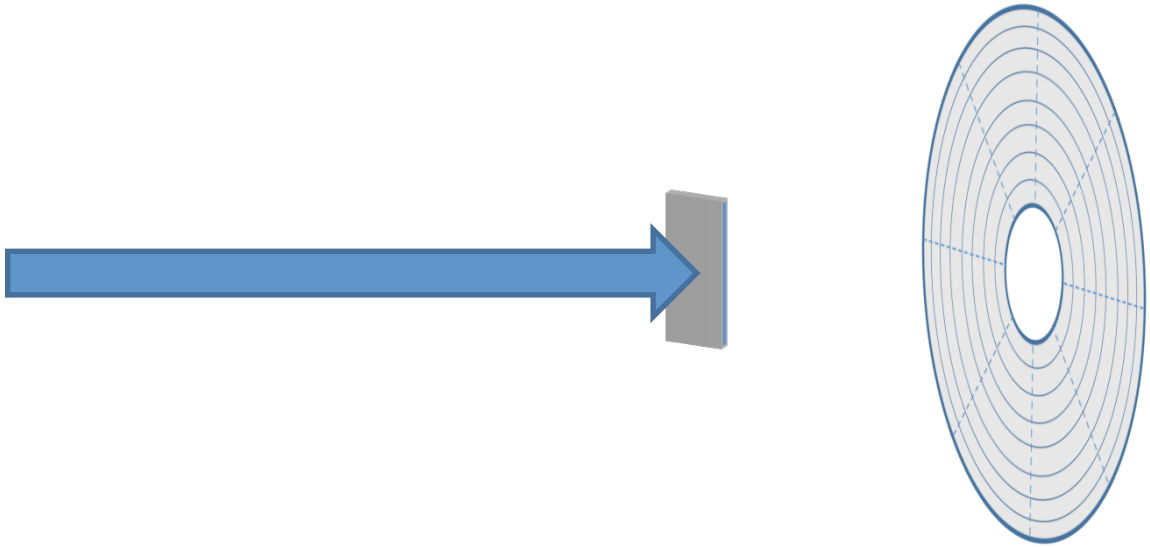


Fig 1. Alpha-particle spectrum from the $^{16}O(n,\alpha)^{13}C$ reaction at 14.1 MeV.

(n,cp)

Rivelatori anulari al silicio, segmentati in angolo polare e azimutale.



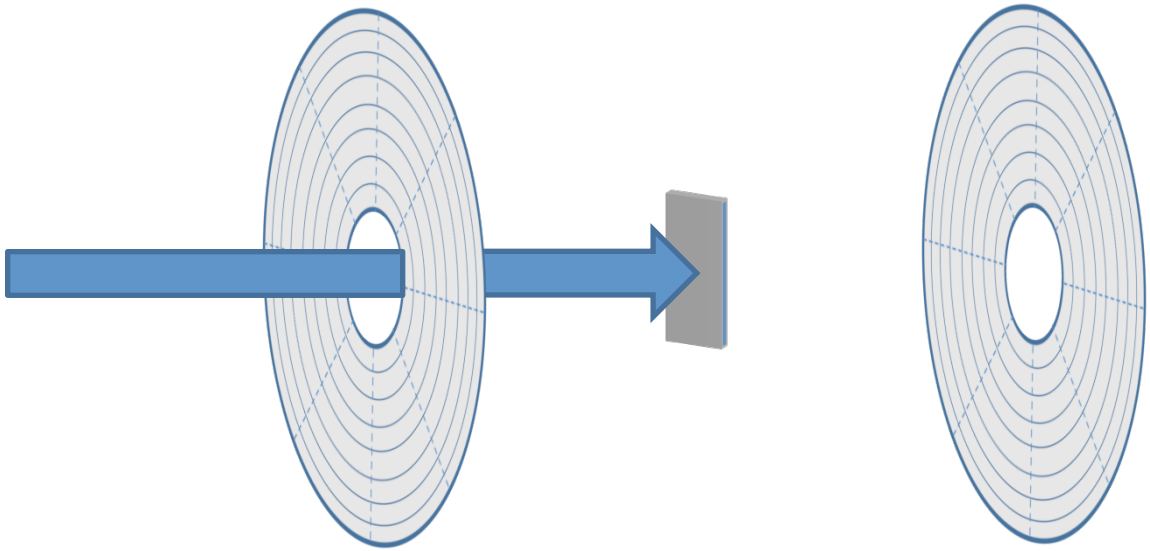
Il diametro interno può essere ampio a sufficienza, per evitare che il fascio colpisca il rivelatore.
Lettura dei segnali analoga agli ordinari rivelatori a strip.

(n,cp)

Rivelatori anulari al silicio, segmentati in angolo polare e azimutale.

Cosa vogliamo?

- *Copertura in angolo solido avanti/indietro*
- *Sensibilità estesa ai neutroni di alta energia (ear1: 15 – 20 Mev)*
- *Basso dead layer*



Il diametro interno può essere ampio a sufficienza, per evitare che il fascio colpisca il rivelatore.
Lettura dei segnali analoga agli ordinari rivelatori a strip.

(n,cp)

Rivelatori anulari al silicio, segmentati in angolo polare e azimutale.

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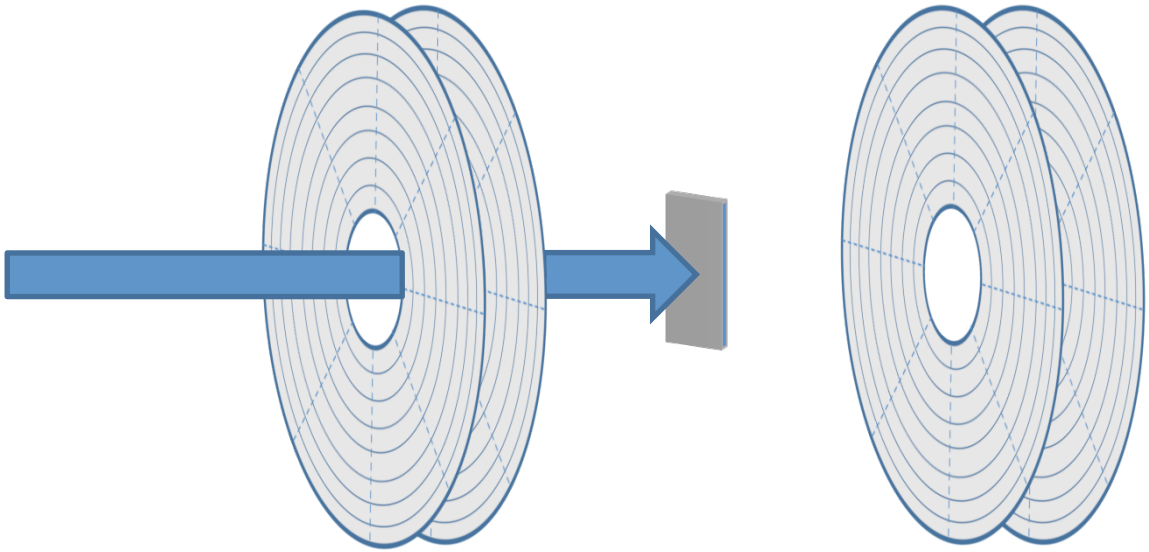
- *Copertura in angolo solido avanti/indietro*
- *Sensibilità estesa ai neutroni di alta energia (ear1: 15 – 20 Mev)*
- *Basso dead layer*
- *Possibilità di eventuale configurazione a telescopio*



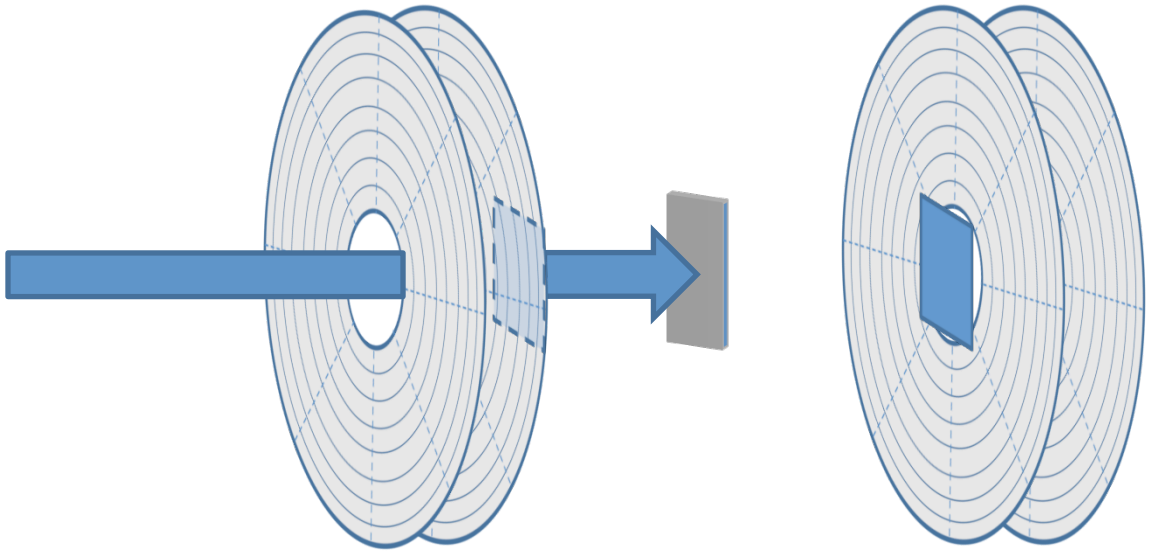
Il diametro interno può essere ampio a sufficienza, per evitare che il fascio colpisca il rivelatore.
Lettura dei segnali analoga agli ordinari rivelatori a strip.
Lo strato ΔE si potrebbe eventualmente realizzare con single pad da 20 micron, anche se ciò comporta una riduzione dell'efficienza

(n,cp)

Rivelatori anulari al silicio, segmentati in angolo polare e azimutale.

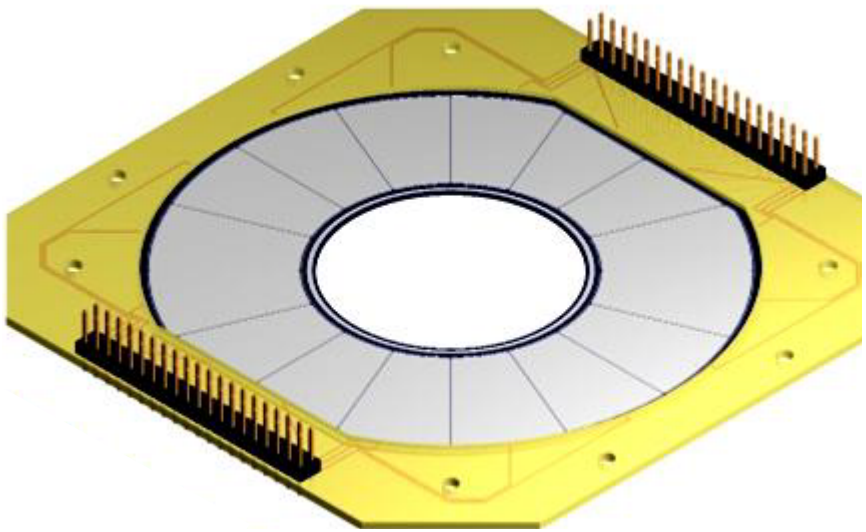
Cosa vogliamo?

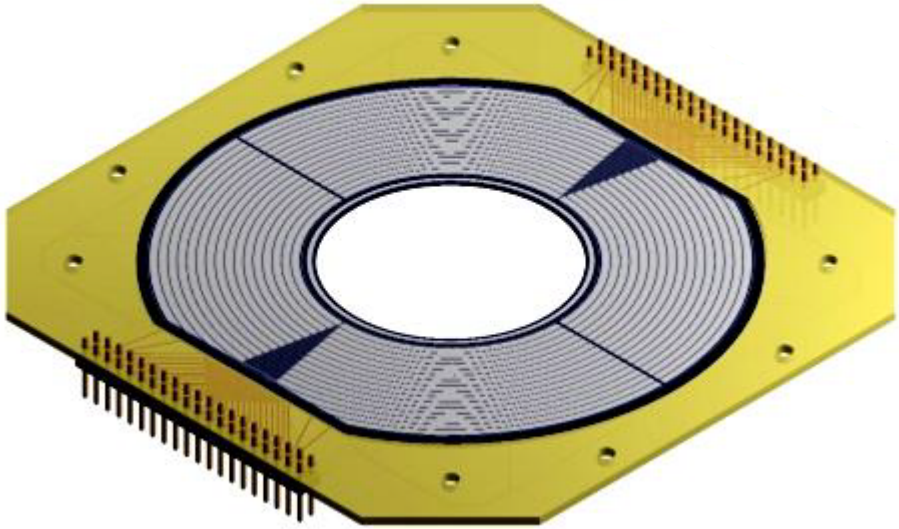
- *Copertura in angolo solido avanti/indietro*
- *Sensibilità estesa ai neutroni di alta energia (ear1: 15 – 20 Mev)*
- *Basso dead layer*
- *Possibilità di eventuale configurazione a telescopio*



(n,cp)

Dal catalogo Micron Semiconductor





In stock 100 e 300 micron

Metallising: Aluminium 3000 angstroms

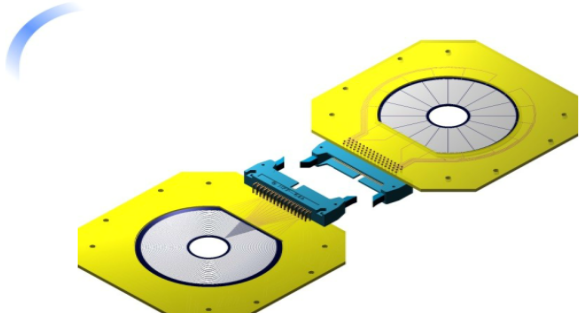
Design	AA Ø Inner (mm)	AA Ø Outer (mm)	CHIP Ø Inner (mm)	CHIP Ø Outer (mm)	Junction Window	Junction Elements	Junction Pitch (mm)	Ohmic Window	Ohmic Elements	Wafer	Guard Ring Design	Package
S1	48.00	96.00	46.00	100.00	2M	64 Incomplete Rings	1.505	2M	16 Sectors	4	MGR	Standard FR4 and Standard FR4 with cooling plate

Single Sided 100 micron: 5 keuro
Doule Sided 300 micron: 6.5 keuro

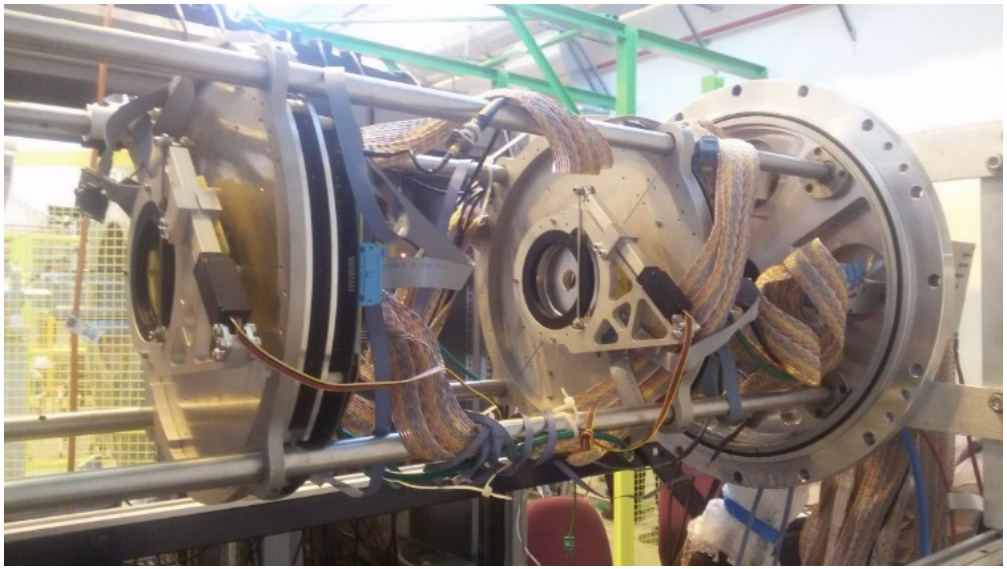
(n,cp)

Full solid angle coverage means no angular distribution issues

Multiplexing **In beam detector** **Quasi In beam detector**

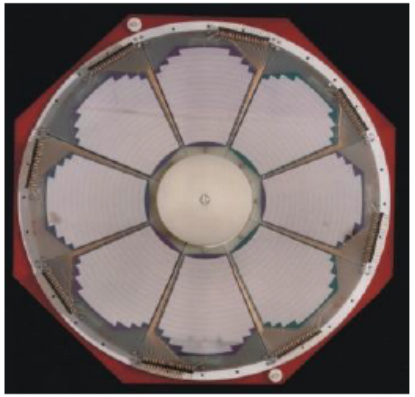


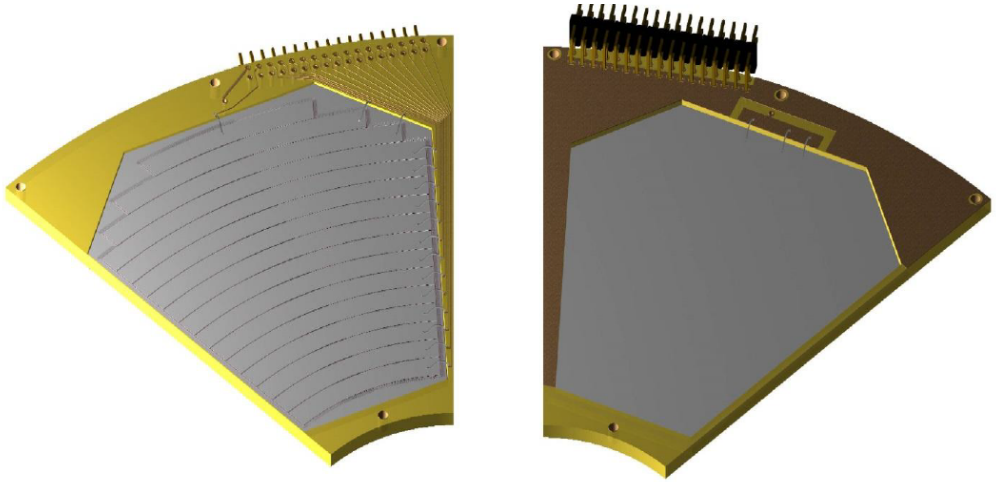
ISOLDE



Dal catalogo Micron Semiconductor

ETECTOR TYPE:	SILICON MICROSTRIP TRAPEZOID OR WEDGE SHAPE STRUCTURE
TECHNOLOGY:	4 INCH SILICON
DESIGN:	Ion implanted totally depleted single sided DC wedge detector that subtends 45° for construction along 360° disc annular microstrip.
PART DESIGNATION:	**YY1**
JUNCTION WINDOW:	2/7/9 M/T/P
OHMIC WINDOW:	2M
ACTIVE INNER DIMENSIONS:	55 mm
ACTIVE OUTER DIMENSIONS:	130 mm
Nº of JUNCTION ELEMENTS:	16
Nº of OHMIC ELEMENTS:	1
ACTIVE AREA:	29 cm^2
Nº of SECTORS:	16
SECTOR SUBTENDS:	45°
JUNCTION PITCH:	5 mm
OHIMC PITCH:	N/A
OPERATING VOLTAGE:	FD to FD +30 V
BREAKDOWN VOLTAGE (10 µA):	> 2 x FD
TOTAL ALPHA RESOLUTION: (FWHM)/SECTOR	100 KeV
TOTAL NOISE (FWHM)/SECTOR:	75 KeV
PULSE RESPONSE TIME:	10 ns typ
TYPE OF PACKAGE:	PCB
SUPPORT STRUCTURE:	Motherboard
CONNECTOR:	IDC Header (2 x





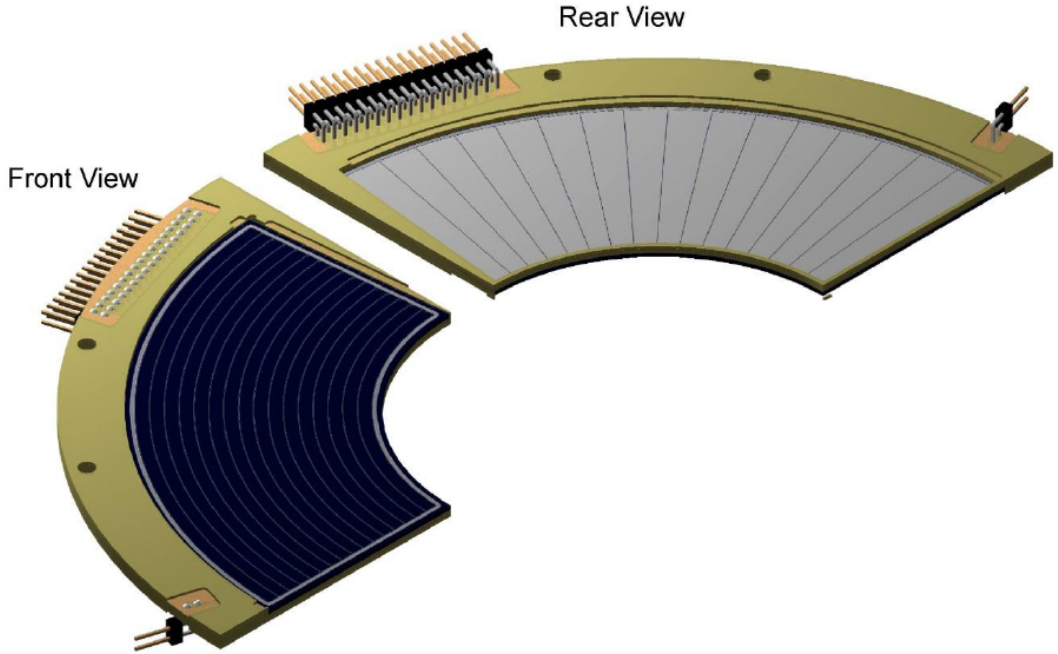
YY1(SS) 9T/2M Assembly Front and Rear Views.

EXPERIMENTS (YY1, LEDA):	University of Edinburgh University of York INFN Catania, ITALY TRIUMF, CANADA

Single Sided 100 micron: 2.5 keuro/sector
Double Sided 300 micron: 3.5 keuro/sector

(n,cp)

Dal catalogo Micron Semiconductor



QQQ3 Assembly.

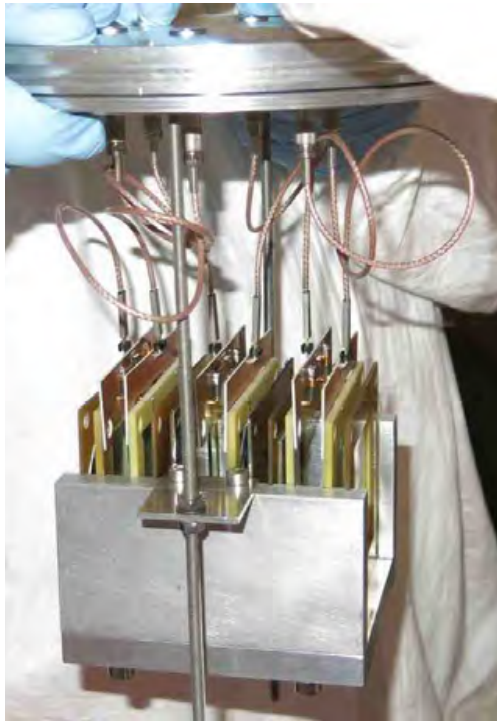
Design	Inner Active Area Radius mm	Outer Active Area Radius mm	Nº Elements	JUNCTION WINDOW	OHMIC WINDOW	Number of Units
QQQ1	9.00	50.00	1	2M	2M	4 Quadrants
QQQ2	9.00	41.00	Junction = 16 Ohmic = 24	2/7/9 M/P	`2M	4 Quadrants
QQQ3	50.1	99.1	Junction = 16 Ohmic = 16	2/7/9 M/T/P	2M	4 Quadrants

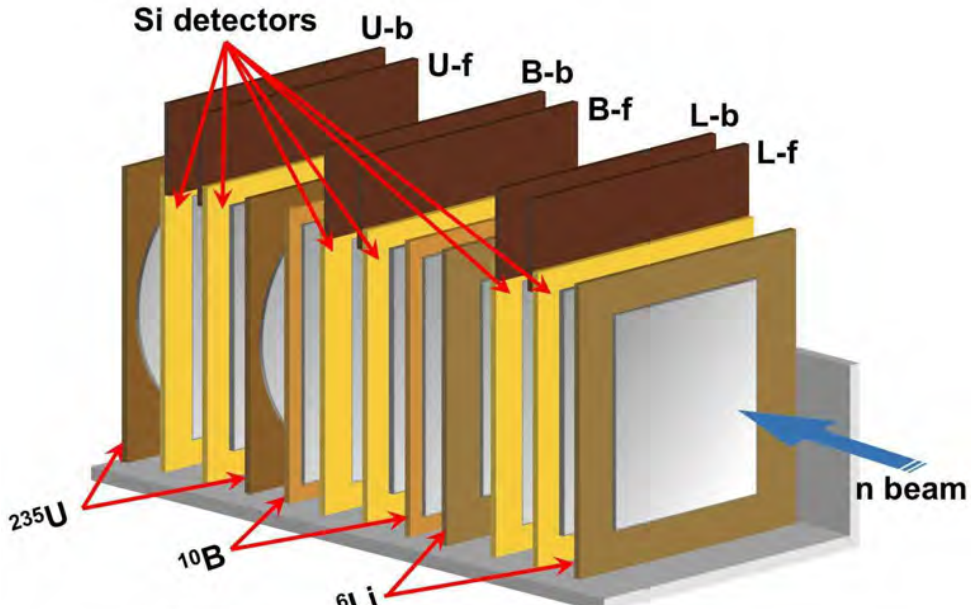
Single Sided 100 micron: 3.5 keuro/sector
Doule Sided 300 micron: 2.5 keuro/sector

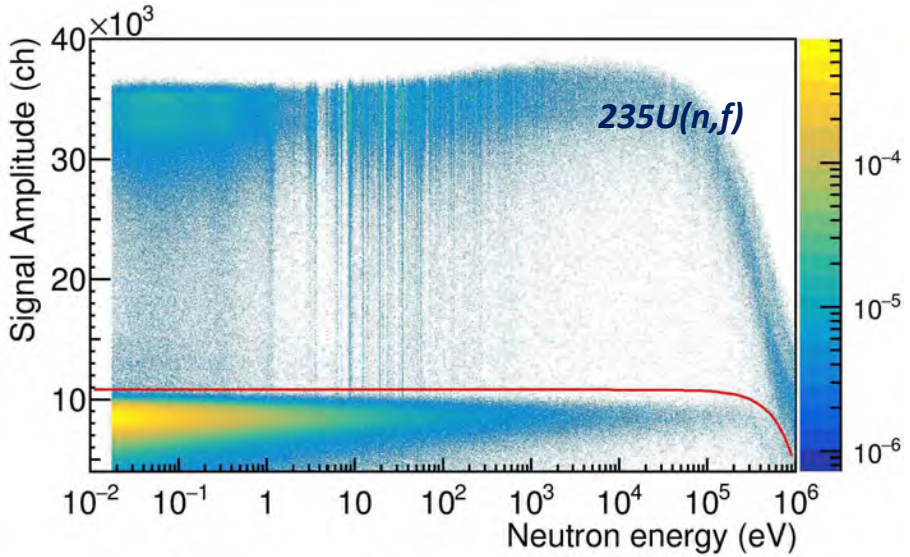
(n,cp)

...non solo cp

Apparato usato per la 235U(n,f)







Preamplificatori

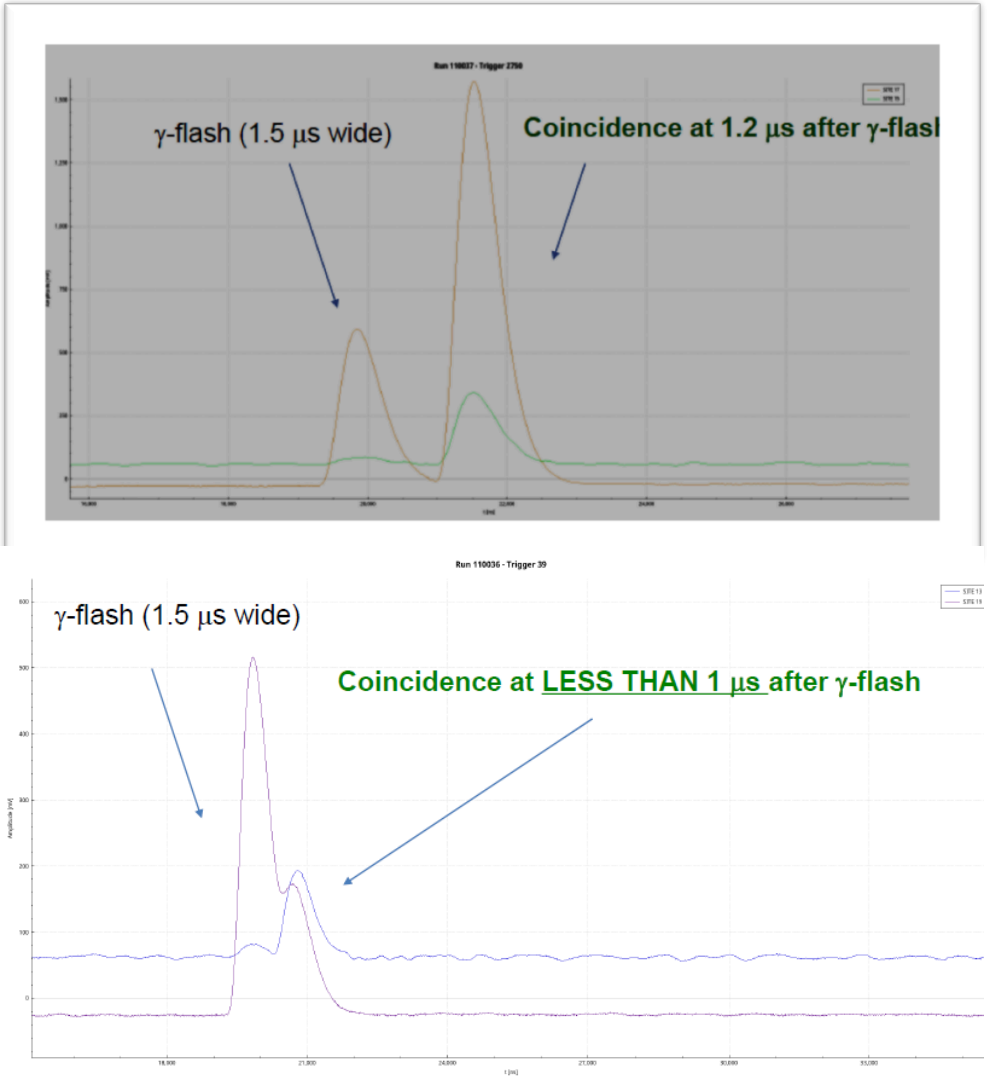
- Num elevato di canali (32 – 64)
- Velocità di risposta entro pochi microsec
- Soppressione gflash..?
- Compatibile con per singole strip e per ampi raggruppamenti
- Almeno 2 range di sensibilità
- Valutare soluzioni Lin-log ?

Integrare soluzioni valide già testate? (ex. Soppressione gflah per misura ossigeno)

Chiedere progettazione ad aziende ‘accreditate’?

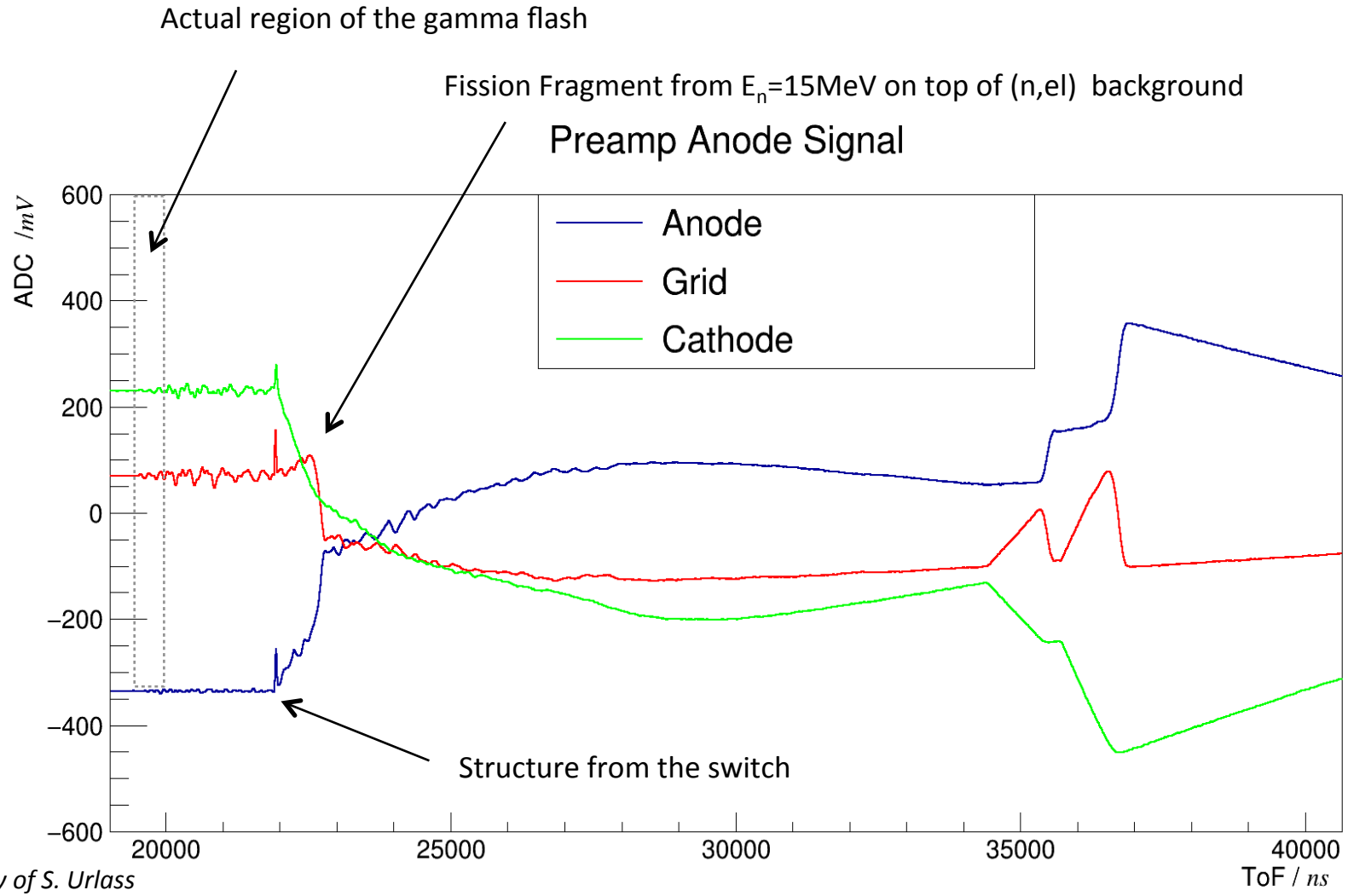
Elettronica di read-out

Telescopio in EAR1 con elettronica 'polacca'



A few preliminary results

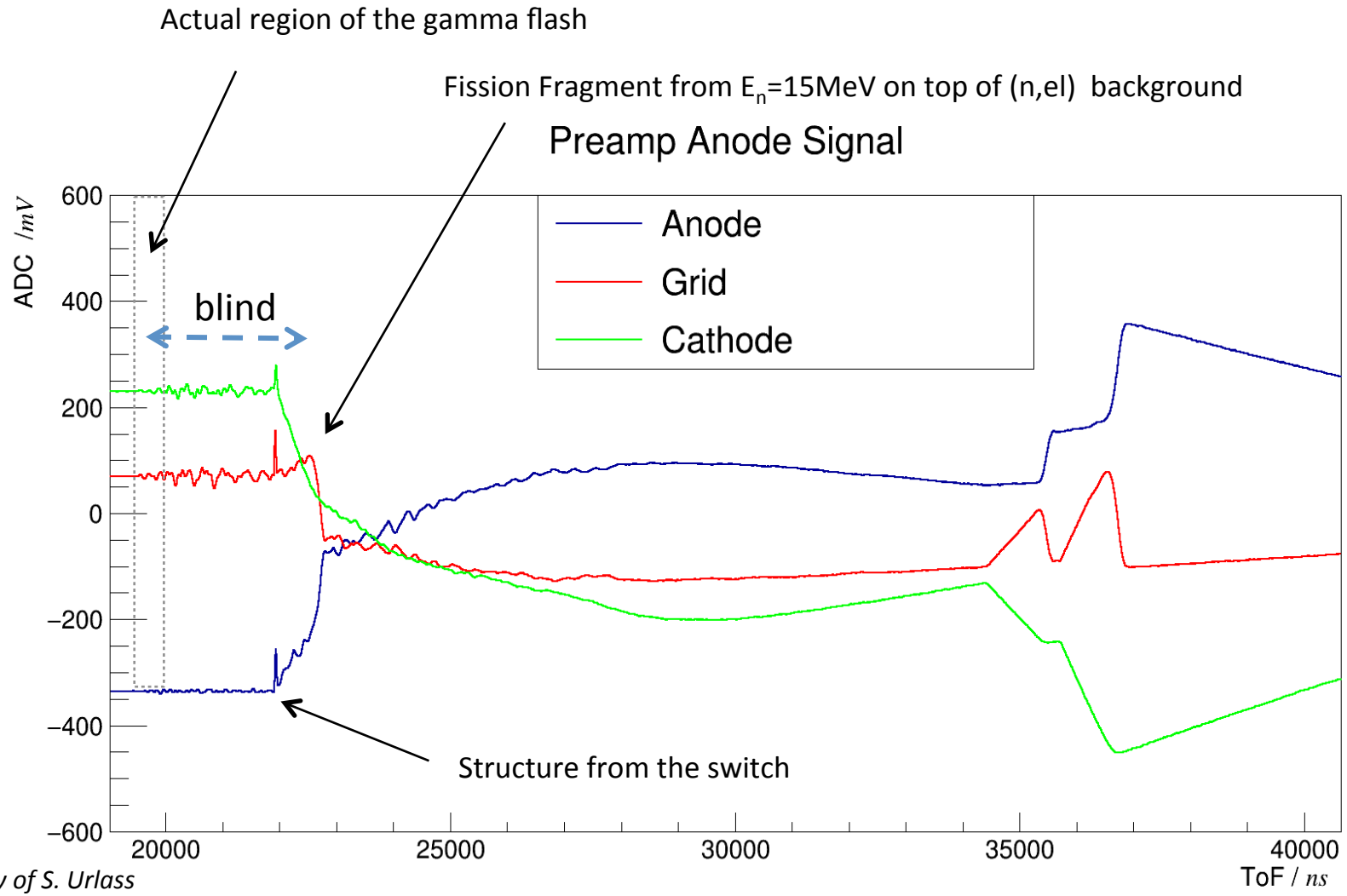
^{16}O (CERN-INTC-2015-001/INTC-P-430)



Courtesy of S. Urlass

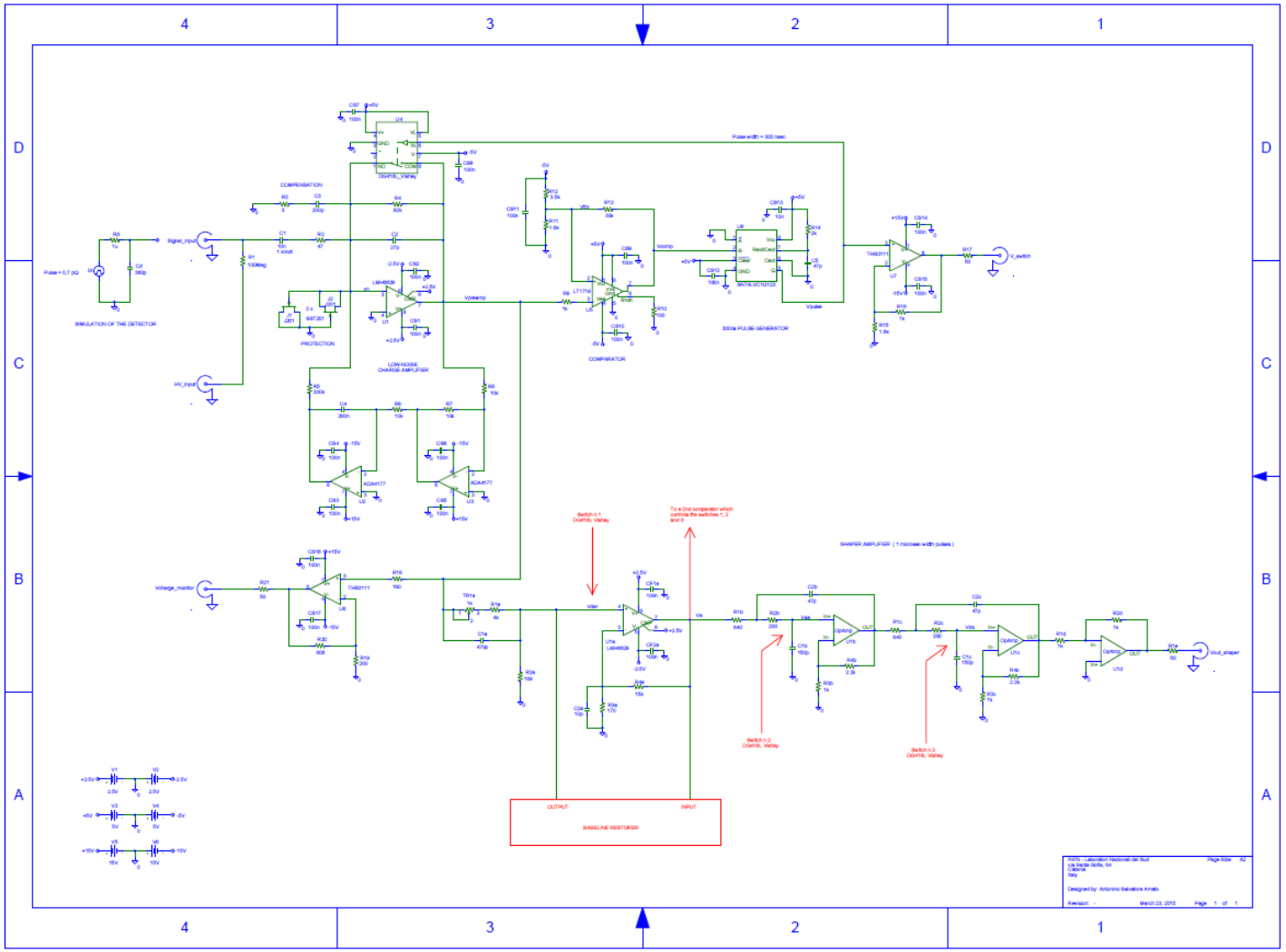
A few preliminary results

^{16}O (CERN-INTC-2015-001/INTC-P-430)

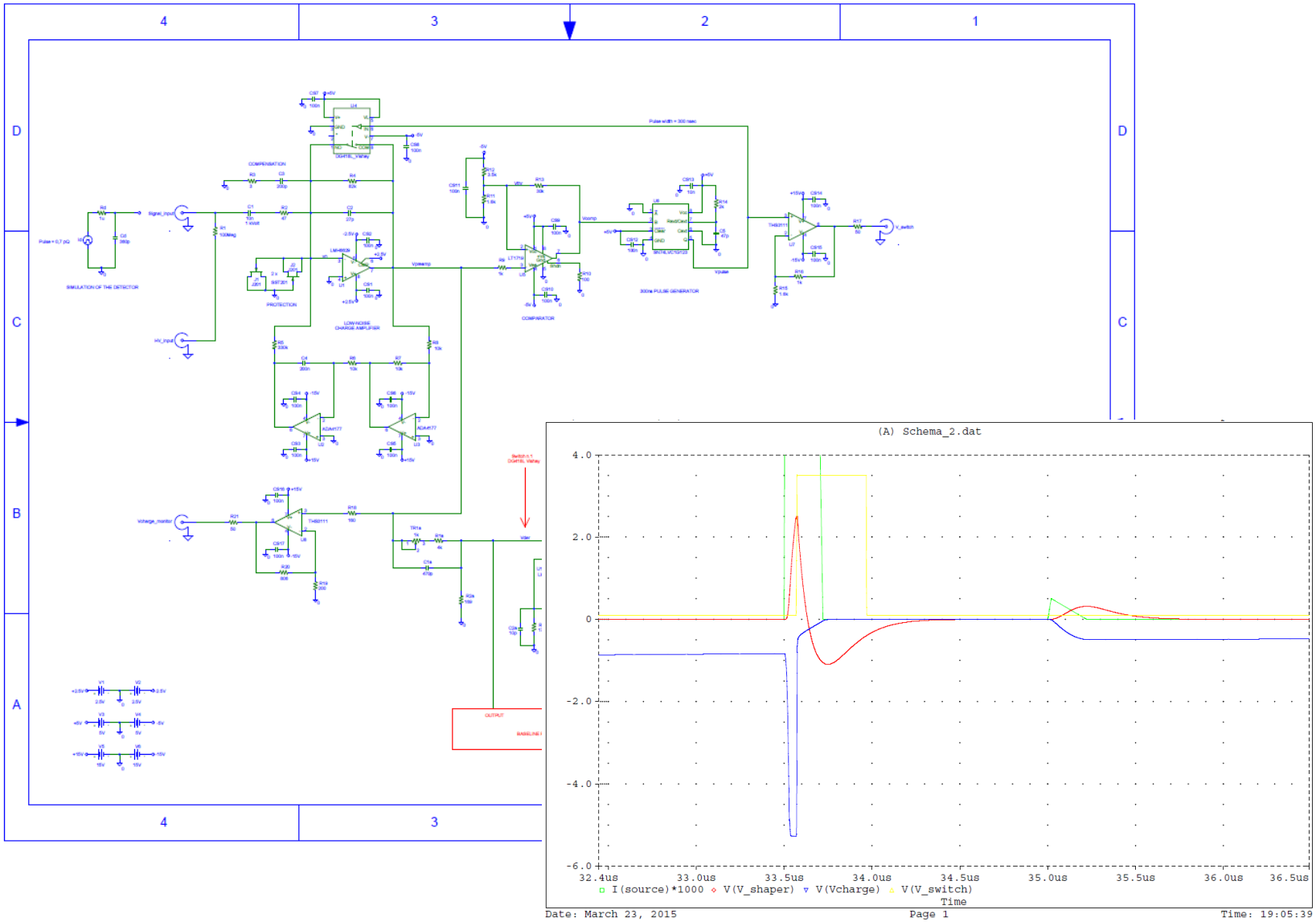


Courtesy of S. Urlass

Progetto Preamplificatore LNS



Progetto Preamplificatore LNS



Il dibattito è aperto…