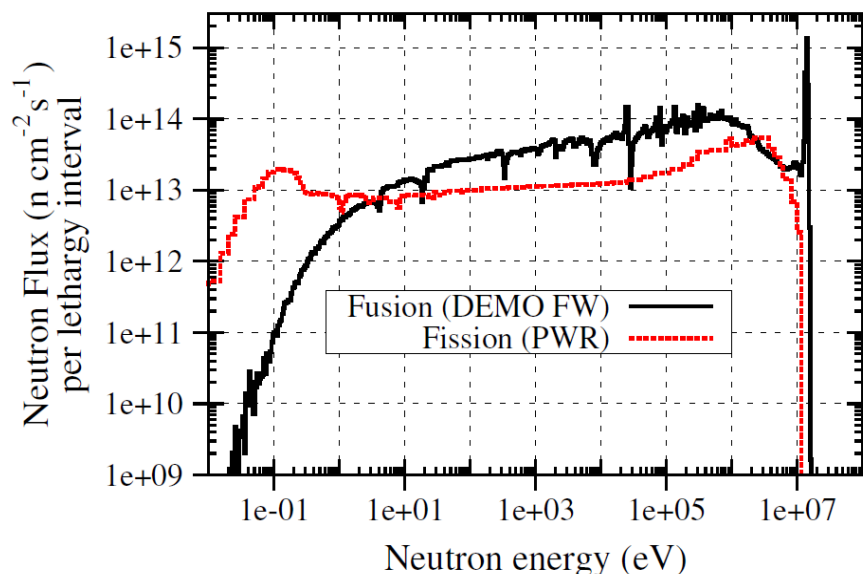


***Apparato di rivelazione ad elevata
copertura angolare per misure (n,cp),
basato su rivelatori al silicio NTD***





*L'elevato flusso neutronico può comportare
infragilimento dei materiali strutturali*

- **Attivazione materiali**
- **Trasmutazione**
- **Produzione di gas a seguito delle reazioni (n,p), (n,α)**

Nuclide	Half-life	Reaction	Residual	Comment
Be-10	1.51 My	(n,γ)	Be-11	No data, difficult to measure
Ne-20	stable	(n,γ)	Ne-21	Discrepant data
Ne-21	stable	(n,γ)	Ne-22	Discrepant data
Ne-22	stable	(n,γ)	Ne-23	Discrepant data

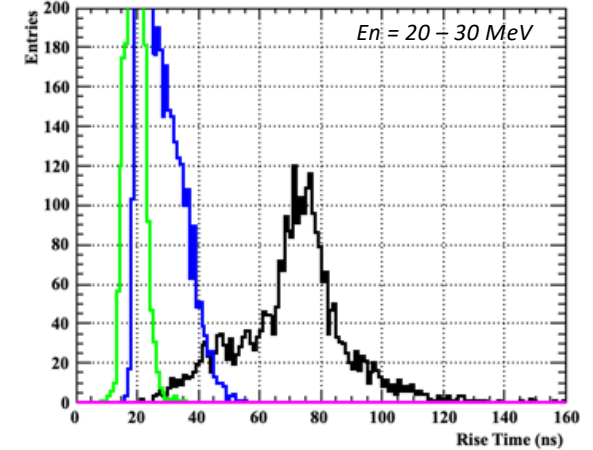
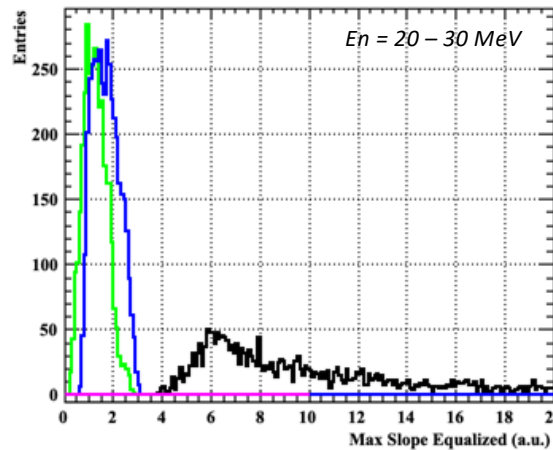
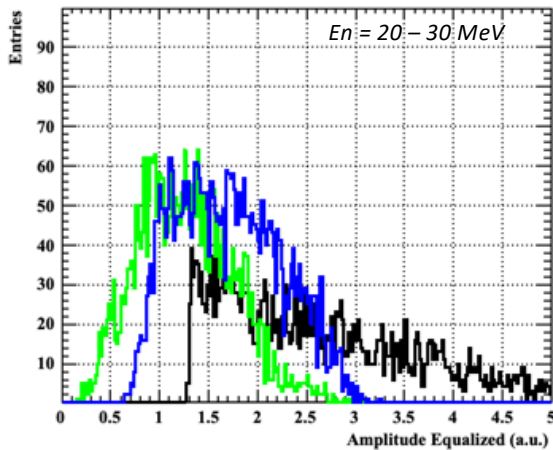
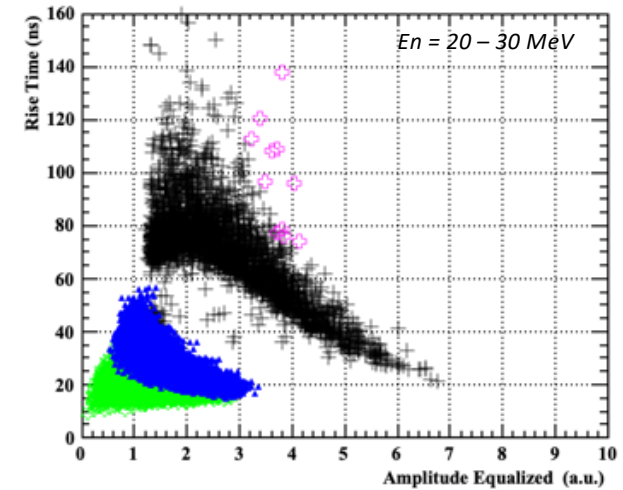
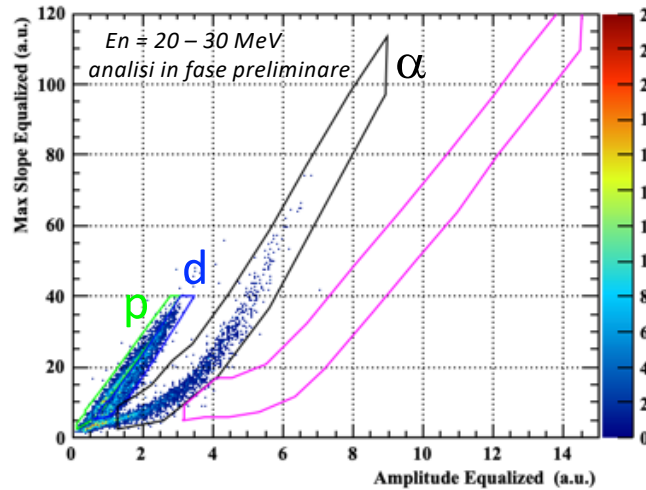
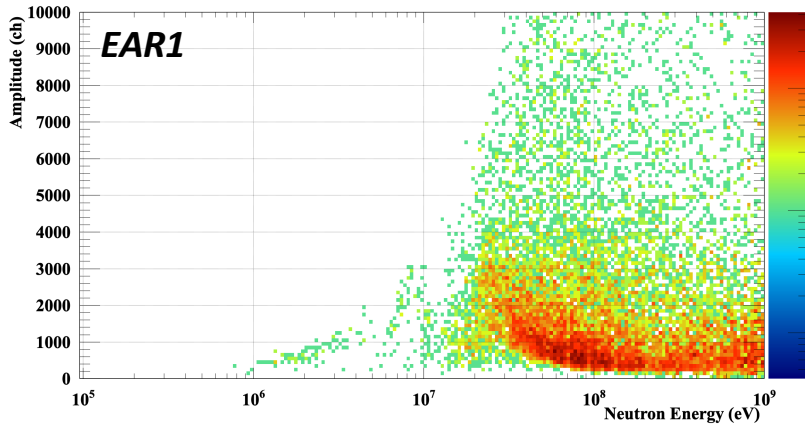
Nuclide	Abund.	Reaction	Comment
Ta-181	100%	(n,α)(n,p)	Lack of data below 14 MeV
W-182	26%	(n,α)(n,p)	Lack of data / No data for (n,α)
W-183	14%	(n,α)(n,p)	Lack of data / No data for (n,α)
W-184	31%	(n,α)(n,p)	Lack of data below 14 MeV
W-186	28%	(n,α)(n,p)	Lack of data below 14 MeV

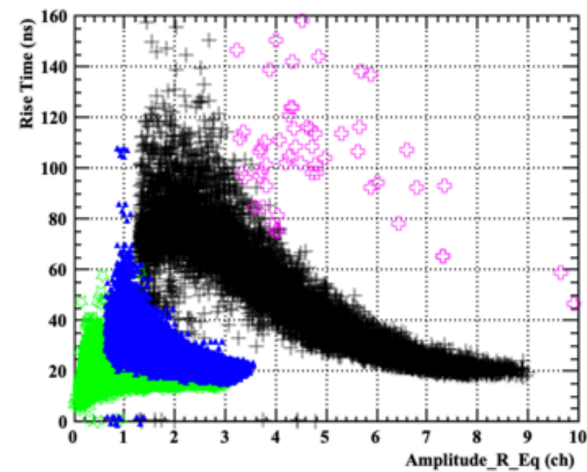
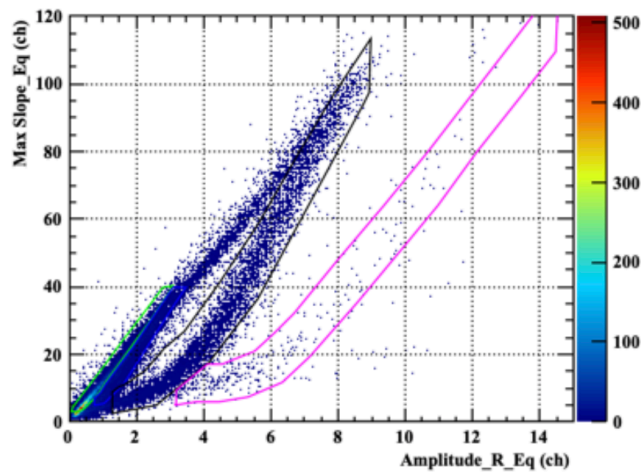
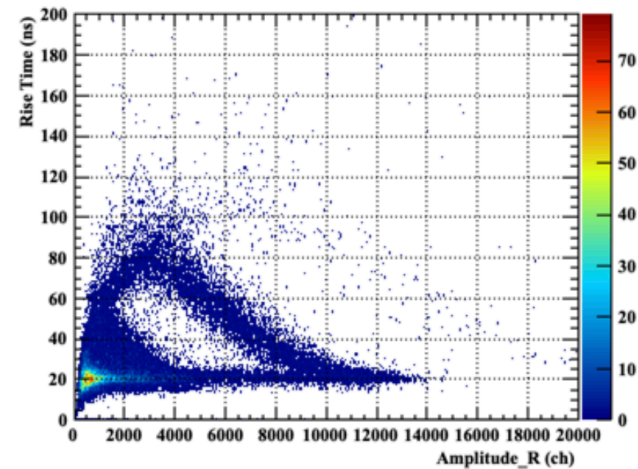
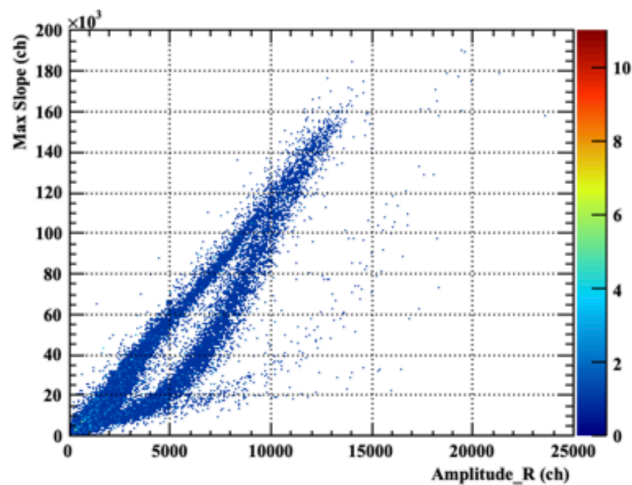
Nuclide	Abund.	Reaction	Comment
Cr-50	4.3%	(n,α)(n,p)	No/little data
Cr-52	83.8%	(n,α)	One data set only
Cr-53	9.5%	(n,α)	No data
Cr-54	2.4%	(n,α)(n,p)	Lack of data below 14 MeV
Mn-55	100%	(n,α)(n,p)	Discrepant data
Fe-56	91.7%	(n,α)	One data set only
Fe-57	2.1%	(n,α)(n,p)	Lack of data / No data for (n,α)
Zr-90	51%	(n,α)	No data
Zr-91	11%	(n,α)	No data
Zr-92	17%	(n,α)	Lack of data below 14 MeV
Nb-93	100%	(n,p)	No data
Mo-92	15%	(n,p)	No data
Mo-94	9.2%	(n,α)(n,p)	Lack of data / No data for (n,α)
Mo-95	16%	(n,α)	One data set only
Mo-96	17%	(n,α)	No data
Mo-97	9.6%	(n,α)	No data
Mo-98	24%	(n,p)	Lack of data below 14 MeV
Mo-100	9.6%	(n,p)	Lack of data below 14 MeV

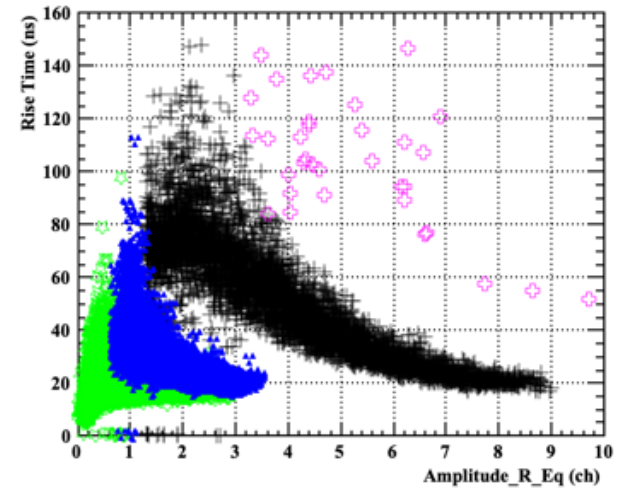
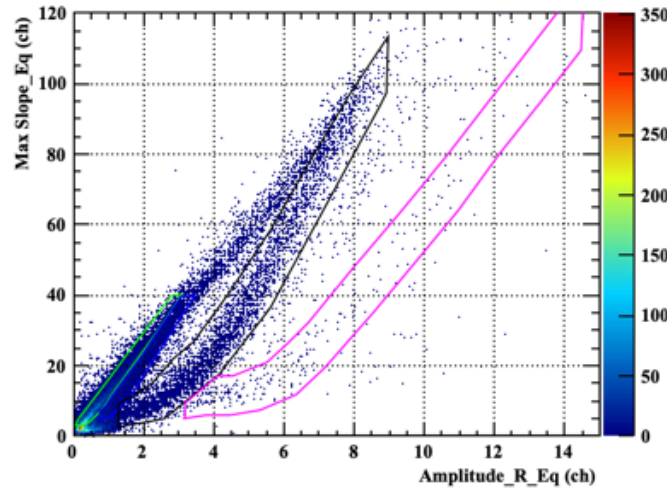
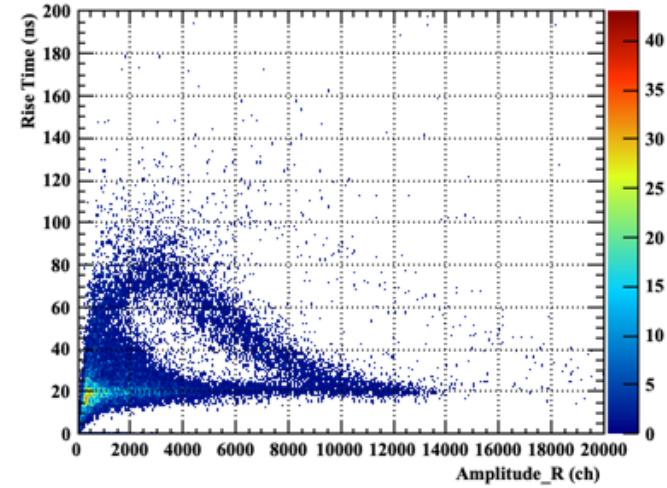
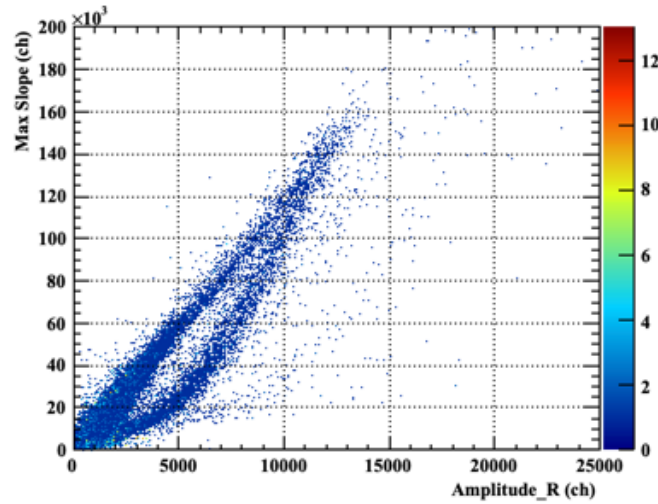
Perchè rivelatori al silicio NTD?

➡ *Particle discrimination con PSA*

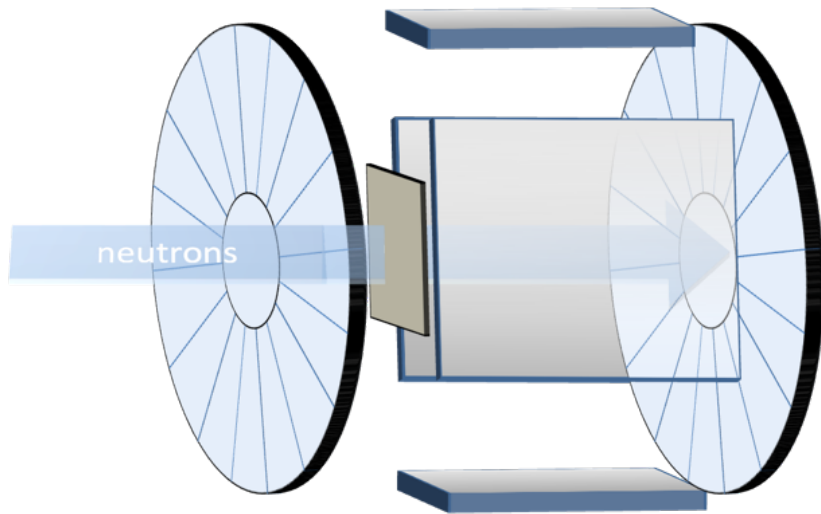
➡ *Esteso range in energia dei neutroni*





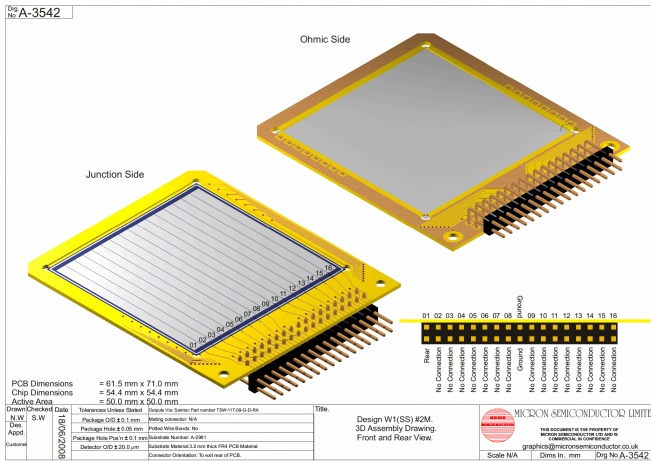


Rivelatore per reazioni (n,cp) ad elevata efficienza geometrica

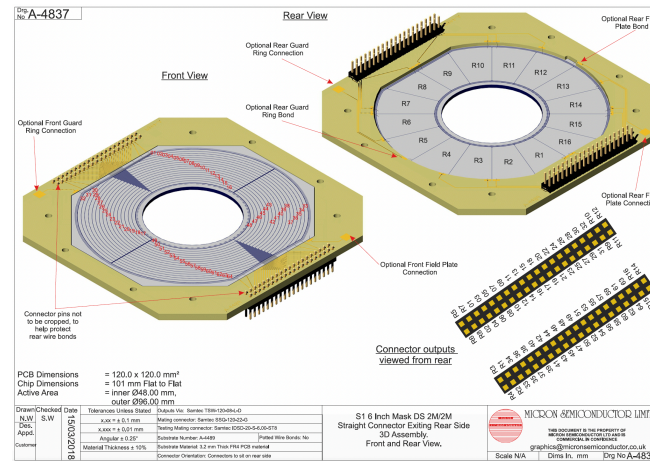


- **Geometrica a simmetria cilindrica**
- **Ampia copertura angolare**
- **Silici NTD (no telescopio)**
- **2 Rivelatori Anulari 16+16 strip, $\Phi = 100$ mm**
- **4 Rivelatori quadrati 16 strip, 50 mm x 50 mm**
- **Efficienza geometrica $\sim 35 \div 40\%$**
- **E_n max**
 - *in EAR1 > 500 MeV*
 - *in EAR2 > 100 MeV*
- **Soglia energia per discriminazione di particelle 1 MeV \div 2 MeV**
- **In totale 128 canali. Da raggruppare (via hardware) di volta in volta, in base alle necessità sperimentali**

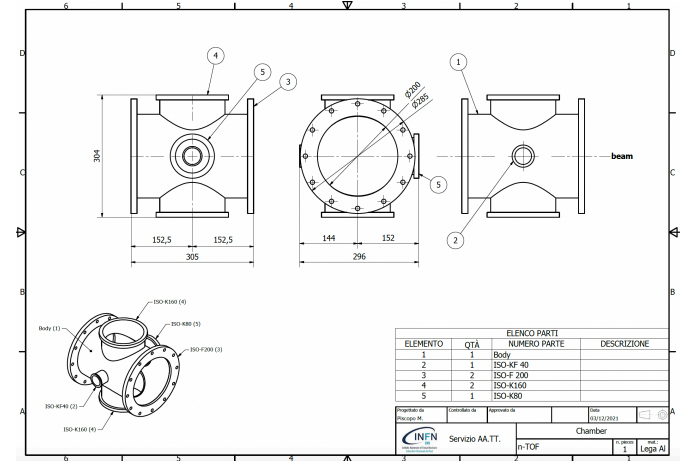
Rivelatore per reazioni (n,cp) ad elevata efficienza geometrica



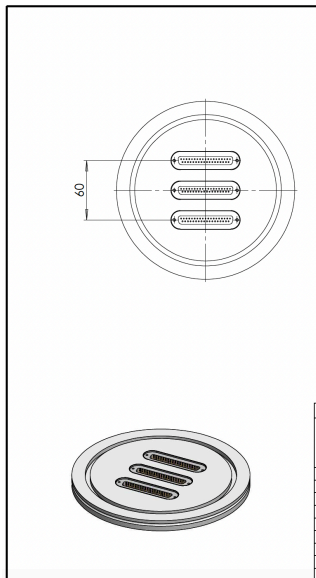
4 x 6 keuro



2 x 10 keuro



**la camera va totalmente riprogettata.
Stimiamo una spesa tra 15 e 20 keuro**



4 x 1.5 keuro



8 x 1.5 keuro

Nella progettazione della meccanica verrà implementata una protezione per il rivelatore, che lo salvaguardi in caso di rottura della finestra durante le procedure di vuoto.